TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India
Department of English
(B.A/B.Com/B.Sc/M.A)
Subject: General English
Syllabus Revision for the Year: 2016-17

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC -ENGLISH	I	I	19	19	
2			II	19	19	
3	BA B.COM/B.SC -ENGLISH	II		19	NIL	
4	BA/B.COM/B.SC -ENGLISH	III	-	-	-	
5	MA ENGLISH	I	I	01	-	
			II	01	-	
6	MA ENGLISH	II	III	01	-	
			IV	01	-	
	Total			61	38	

Total Number of Programmes: 61

Total Number of Courses: 38

Percentage of Revision: 62.29

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

Head
DEPARTMENT OF ENGLISH

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

Department of English

(B.A/B.Com/B.Sc/M.A)

Subject: General English

Syllabus Revision for the Year: 2017-18

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC -ENGLISH	I	I	20	NIL	
2			II	20	NIL	
3	BA/B.COM/B.SC -ENGLISH	II	III	19	19	
			IV	19	19	
4	BA/B.COM/B.SC -ENGLISH	III	-	-	-	
5	MA ENGLISH	I	I	01	NIL	
			II	01	NIL	
6	MA ENGLISH	II	III	01	NIL	
			IV	01	NIL	
	Total			82	38	

Total Number of Programmes: 82

Total Number of Courses: 38

Percentage of Revision: 46.34

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Head

Department of English

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India
Department of English
(B.A/B.Com/B.Sc/M.A)
Subject: General English

Syllabus Revision for the Year: 2018-19

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC -ENGLISH	I	I	25	NIL	
2			II	25	NIL	
3	BA/B.COM/B.SC -ENGLISH	II	III	20	NIL	
			IV	20	NIL	
4	BA/B.COM/B.SC -ENGLISH	III	-	-	-	
5	MA ENGLISH	I	I	01	NIL	
			II	01	NIL	
6	MA ENGLISH	II	III	01	NIL	
			IV	01	NIL	
	Total			94	NIL	

Total Number of Programmes 94

Total Number of Courses : -

Percentage of Revision : NO CHANGE

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

Head

DEPARTMENT OF ENGLISH

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

Department of English

(B.A/B.Com/B.Sc/M.A)

Subject: General English

Syllabus Revision for the Year: 2019-20

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC -ENGLISH	I	I	26	NIL	--
2			II	26	NIL	--
3	BA/B.COM/B.SC -ENGLISH	II	III	25+10	NIL+10	SEC
			IV	25	NIL	--
4	BA/B.COM/B.SC -ENGLISH	III	-	-	-	--
5	MA ENGLISH	I	I	01	01	Paper-I changed
			II	01	NIL	--
6	MA ENGLISH	II	III	01	01	Paper -I changed
			IV	01	01	Paper-I changed
	Total			106	13	

Total Number of Programmes: 106

Total Number of Courses: 13

Percentage of Revision: 12.26

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Head

DEPARTMENT OF ENGLISH

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

Department of English

(B.A/B.Com/B.Sc/M.A)

Subject: General English

Syllabus Revision for the Year: 2020-21

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC -ENGLISH	I	I	41	NIL	--
2			II	41	NIL	--
3	BA/B.COM/B.SC -ENGLISH	II	III	26	26	--
			IV	26	26	--
4	BA/B.COM/B.SC -ENGLISH	III	-	-	-	--
5	MA ENGLISH	I	I	01	NIL	
			II	01	NIL	--
6	MA ENGLISH	II	III	01	01	
			IV	01	NIL	
	Total			138	53	

Total Number of Programmes: 138

Total Number of Courses: 53

Percentage of Revision: 38.4

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

Head

Department of English

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

Department of English

(B.A/B.Com/B.Sc/M.A)

Subject: General English

Syllabus Revision for the Year: 2021-22

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having change	Remarks
1	BA/B.COM/B.SC -ENGLISH	I	I	40	40	–
2			II	40	40	–
3	BA/B.COM/B.SC -ENGLISH	II	III	40	NIL	–
			IV	40	NIL	–
4	BA/B.COM/B.SC -ENGLISH	III	V	26	26	–
			VI	26	26	
5	MA ENGLISH	I	I	10	NIL	
			II	10	10	Paper-1- Changed
6	MA ENGLISH	II	III	10	-	
			IV	10	-	
	Total			220	135	

Total Number of Programmes: 220

Total Number of Courses: 135

Percentage of Revision: 61.36

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

Head

DEPARTMENT OF ENGLISH

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India
Department of English
(B.A (HPML))

Subject: Modern Language -English
Syllabus Revision for the Year: 2016-17

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA ML -ENGLISH	I	I	1	1	
2			II	1	1	
3	BA ML -ENGLISH	II		-	-	
4	BA ML -ENGLISH	III		-	-	
	Total			2	2	

Total Number of Programmes : 2

Total Number of Courses : 2

Percentage of Revision : 100

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Head

Department of English

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India
Department of English
(B.A (HPML))

Subject: Modern Language -English

Syllabus Revision for the Year: 2017-18

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA ML -ENGLISH	I	I	1	NIL	
2			II	1	NIL	
3	BA ML -ENGLISH	II	III	1	1	
4			IV	1	1	
5	BA ML -ENGLISH	III	V	-	-	
	Total			4	2	

Total Number of Programmes : 4

Total Number of Courses : 2

Percentage of Revision : 50

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Head

Department of English

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India
Department of English
(B.A (HPML))

Subject: Modern Language -English
Syllabus Revision for the Year: 2018-19

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA ML -ENGLISH	I	I	1	NIL	
2			II	1	NIL	
3	BA ML -ENGLISH	II	III	1	NIL	
4			IV	1	NIL	
5	BA ML -ENGLISH	III	V	1	1	
6			VI	1	1	
	Total			6	2	

Total Number of Programmes : 6

Total Number of Courses : 2

Percentage of Revision : 33.33

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

Head

Department of English

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India
Department of English
(B.A (HPML))

Subject: Modern Language -English
Syllabus Revision for the Year: 2019-20

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA ML -ENGLISH	I	I	1	NIL	
2			II	1	NIL	
3	BA ML -ENGLISH	II	III	1	NIL	
4			IV	1	NIL	
5	BA ML -ENGLISH	III	V	1	NIL	
6			VI	1	NIL	
	Total			6	NIL	

Total Number of Programmes : 6

Total Number of Courses : NIL

Percentage of Revision : NO CHANGE

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

Head

Department of English

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2017-2018

SUBJECT: TELUGU

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	1	NIL	
2			II	1	NIL	
3	B.A., B.COM., B.SC.	II	III	1	19	
			IV	1	19	
4	B.A., B.COM., B.SC.	III	-	-	-	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			98	38	

Total Number of Programmes : 98

Total Number of Courses : 38

Percentage of Revision : 38.7

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

Osmania University, Hyderabad

CBCS SEMESTER - 3 (2017-18) TELUGU SYLLABUS

B.A., /B.Com.,/ B.Sc., / B.B.A., (ద్వితీయ భాష) తెలుగు - మూడవ సెమిస్టర్

సిలబస్ (మార్గదర్శి)

ప్రాచీన పద్యభాగం

1. ధర్మరాజు వాక్ చాతుర్యం .... తిక్కన
2. విభీషణ శరణాగతి .... గోన బుద్ధారెడ్డి
3. గుణనిధి కథ .... శ్రీనాథుడు

ఆధునిక పద్యభాగం

1. రైతు ప్రశస్తి ... వానమామలై జగన్నాథాచార్యులు
2. గురు దక్షిణ ... అంబటి లక్ష్మీనరసింహ రాజు
3. గుడిసెలు కాలిపోతున్నై ... బోయి భీమన్న

వచన విభాగం (నాటకం)

చలి చీమలు నాటకం ... పి.వి. రమణ

అలంకారాలు

శబ్దాలంకారాలు : వృత్త్యనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యానుప్రాస, యమకం, ముక్తపదగ్రస్తాలంకారాలు.

అర్థాలంకారాలు : ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, ఉల్లేఖ, అర్థాంతరన్యాస, శ్లేష, దృష్టాంతాలంకారాలు.

HEAD
DEPT. OF TELUGU
OSMANIA UNIVERSITY
HYDERABAD-500 007

P. Vanaja Rao
Asst. Professor
Dept. of Telugu,
Osmania University
Hyderabad, Telangana State

Dr. Darla Venkateswara Rao
Professor, Department of Telugu
School of Humanities
UNIVERSITY OF HYDERABAD
Hyderabad-500 046., T.S. India

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY- 502 001.

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I

Osmania University, Hyderabad

CBCS SEMESTER - 4 (2017-18) TELUGU SYLLABUS

B.A., /B.Com.,/ B.Sc., / B.B.A., (ద్వితీయ భాష) తెలుగు – నాల్గవ సెమిస్టర్

సిలబస్ (మార్గదర్శి)

ప్రాచీన పద్యభాగం

1. నారద గాన మాత్సర్యం .... పింగళి సూరన
2. వాగ్దాన భంగం .... ఆసూరి మరింగంటి వేంకట నరసింహాచార్యులు
3. నారసింహ శతకం ... ధర్మపురి శేషప్ప

ఆధునిక పద్యభాగం

1. నరుడా నేను నరుడా నేను .... కాళోజీ
2. ఆర్తగీతం ... తిలక్
3. దేవరకొండ దుర్గం ... డా॥ ముకురాల రామారెడ్డి

వచన విభాగం

1. అర్ధరాత్రి అరుణోదయం ... దాశరథి
2. సి.పి.బ్రౌన్ సాహిత్య సేవ ... జానుమద్ది హనుమచ్ఛాస్త్రి
3. మన గ్రామనామాలు ... డా॥ కపిలవాయి లింగమూర్తి
4. నివురు తొలగిన నిప్పు ... పోల్కంపల్లి శాంతాదేవి
5. కొండ మల్లెలు ... ఇల్లిందల సరస్వతీ దేవి

ఛందస్సు

పాఠ్య గ్రంథము లోనివి.

సామాజిక వ్యాసం.

Chairman
Board of Studies In Telugu
Osmania University Hyderabad

HEAD
DEPT. OF TELUGU
OSMANIA UNIVERSITY
HYDERABAD. 500 007

P. Vanaja Rao
Asst. Professor
Dept. of Telugu,
Osmania University
Hyderabad, Telangana State

Dr. Darla Venkateswara Rao
Professor, Department of Telugu
Faculty of Humanities
OSMANIA UNIVERSITY OF HYDERABAD
Pin 500 046., T.S. India

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY- 502 001

15

I

Osmania University, Hyderabad

CBCS SEMESTER - 4 (2017-18) TELUGU SYLLABUS

B.A., /B.Com.,/ B.Sc., / B.B.A., (ద్వితీయ భాష) తెలుగు – నాల్గవ సెమిస్టర్

సిలబస్ (మార్గదర్శి)

ప్రాచీన పద్యభాగం

1. నారద గాన మాత్సర్యం .... పింగళి సూరన
2. వాగ్దాన భంగం .... ఆసూరి మరింగంటి వేంకట నరసింహాచార్యులు
3. నారసింహ శతకం ... ధర్మపురి శేషప్ప

ఆధునిక పద్యభాగం

1. నరుడా నేను నరుడా నేను .... కాళోజీ
2. ఆర్తగీతం ... తిలక్
3. దేవరకొండ దుర్గం ... డా॥ ముకురాల రామారెడ్డి

వచన విభాగం

1. అర్ధరాత్రి అరుణోదయం ... దాశరథి
2. సి.పి.బ్రౌన్ సాహిత్య సేవ ... జానుమద్ది హనుమచ్ఛాస్త్రి
3. మన గ్రామనామాలు ... డా॥ కపిలవాయి లింగమూర్తి
4. నివురు తొలగిన నిప్పు ... పోల్కంపల్లి శాంతాదేవి
5. కొండ మల్లెలు ... ఇల్లిందల సరస్వతీ దేవి

ఛందస్సు

పాఠ్య గ్రంథము లోనివి.

సామాజిక వ్యాసం.

Chairman
Board of Studies In Telugu
Osmania University Hyderabad

HEAD
DEPT. OF TELUGU
OSMANIA UNIVERSITY
HYDERABAD. 500 007

P. Vanaja Rao
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PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY- 502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2018-2019

SUBJECT: TELUGU

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	25	25	
2			II	25	25	
3	B.A., B.COM., B.SC.	II	III	20	20	
			IV	20	20	
4	B.A., B.COM., B.SC.	III	-	NIL	NIL	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			110	90	

Total Number of Programmes : 110

Total Number of Courses : 90

Percentage of Revision : 81

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

బి.ఏ./బి.కాం/బి.ఎస్సీ - సి.బి.సి.ఎస్ పద్ధతి - తెలుగు (ద్వితీయ భాష) 2018-19

పాఠ్య ప్రణాళిక - మొదటి సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - భాషా విభాగం - ఉపవాచకం

ప్రాచీన కవిత్వం:

1. శకుంతలోపాఖ్యానము - నన్నయభట్టు - ఆంధ్రమహాభారతం - ఆది పర్వంలోని చతుర్థాశ్వాసం
2. గొడగూచి - పాల్కురికి సోమనాథుడు - బసవ పురాణం - తృతీయాశ్వాసం
3. ప్రవరుడు - అల్లసాని పెద్దన - మనుచరిత్ర - ప్రథమాశ్వాసం.

ఆధునిక కవిత్వం:

1. కాసులు - గురజాడ అప్పారావు - గురజాడ రచనలు
2. రాజు-కవి - గుర్రం జాషువా - కొత్తలోకం
3. గంగిరెద్దు - డా. పల్లా దుర్గయ్య - గంగిరెద్దు కావ్యం
4. జయభేరి - శ్రీశ్రీ - మహాప్రస్థానం

భాషా విభాగం:

1. భాషా భాగాలు
2. సాధు శబ్దాలు
3. పర్యాయ పదాలు
4. నానార్థాలు

ఉపవాచకం

రుద్రమదేవి నవల - ఒద్దిరాజు సీతారామ చంద్రరాయ శర్మ

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Hyderabad-500 046, TS, India

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Chairman
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Osmania University
Hyderabad-Telangana

తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

బి.ఏ./బి.కాం/బి.ఎస్సీ - సి.బి.సి.ఎస్ పద్ధతి - తెలుగు (ద్వితీయ భాష) 2018-19

పాఠ్య ప్రణాళిక - రెండవ సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - వచన విభాగం - భాషా విభాగం

ప్రాచీన కవిత్వం:

1. గజేంద్ర మోక్షము - బమ్మెర పోతన - ఆంధ్ర మహాభాగవతంలోని అష్టమ స్కందం నుండి.
2. హనుమత్సందేశము - మొల్ల - రామాయణంలోని సుందరకాండ నుండి.
3. సుభాషితములు - ఏనుగు లక్ష్మణకవి - భర్తృహరి సుభాషిత త్రిశతి నుండి.

ఆధునిక కవిత్వం:

1. పల్లెటూరి పిల్లగాడా - సుద్దాల హనుమంతు - "పల్లెటూరి పిల్లగాడా" అనే సంకలనం నుండి.
2. ప్రపంచపదులు - డా. సి. నారాయణరెడ్డి - ప్రపంచపదులు అనే గ్రంథం నుండి.
3. రోడ్డు రోలర్ - ఆచార్య పేర్వారం జగన్నాథం - చేతనావర్త కవుల సంపుటి నుండి.
4. అల్విదా - కౌముది - అల్విదా కవితా సర్వస్వం నుండి.

వచన విభాగం:

1. యుగాంతం (కథానిక) - నెల్లూరి కేశవస్వామి - నెల్లూరి కేశవస్వామి ఉత్తమ కథల నుండి.
2. ఎంకన్న (కథానిక) - ఆచార్య పాకాల యశోదారెడ్డి - యశోదారెడ్డి ఉత్తమ కథల నుండి.
3. మూమిడిపందు (వ్యాసం) - సురవరం ప్రతాపరెడ్డి - సురవరం ప్రతాపరెడ్డి వ్యాసాలు అనే గ్రంథం నుండి.
4. మా ఊరు పోయింది (వ్యాసం) - దేవులపల్లి వేంకట కృష్ణశాస్త్రి - పుష్పలావికలు అనే వ్యాస సంపుటి నుండి.

భాషా విభాగం:

సంధులు :

1. సంస్కృత సంధులు - సవర్ణదీర్ఘసంధి, గుణసంధి, వృద్ధిసంధి, యణాదేశసంధి.
2. తెలుగు సంధులు - అత్వసంధి, ఇత్వసంధి, త్రికసంధి, గసదదవాదేశసంధి, రుగాగమసంధి, టుగాగమసంధి, ఆమ్రేడితసంధి, పుంప్వాదేశసంధి.

సమాసాలు:

తత్పురుష సమాసం, కర్మధారయ సమాసం, బహువ్రీహి సమాసం, ద్వంద్వ సమాసం, ద్విగు సమాసం.

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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

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పాఠ్య ప్రణాళిక - రెండవ సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - వచన విభాగం - భాషా విభాగం

ప్రాచీన కవిత్వం:

1. గజేంద్ర మోక్షము - బమ్మెర పోతన - ఆంధ్ర మహాభాగవతంలోని అష్టమ స్కందం నుండి.
2. హనుమత్సందేశము - మొల్ల - రామాయణంలోని సుందరకాండ నుండి.
3. సుభాషితములు - ఏనుగు లక్ష్మణకవి - భర్తృహరి సుభాషిత త్రిశతి నుండి.

ఆధునిక కవిత్వం:

1. పల్లెటూరి పిల్లగాడా - సుద్దాల హనుమంతు - "పల్లెటూరి పిల్లగాడా" అనే సంకలనం నుండి.
2. ప్రపంచపదులు - డా. సి. నారాయణరెడ్డి - ప్రపంచపదులు అనే గ్రంథం నుండి.
3. రోడ్డు రోలర్ - ఆచార్య పేర్వారం జగన్నాథం - చేతనావర్త కవుల సంపుటి నుండి.
4. అల్విదా - కౌముది - అల్విదా కవితా సర్వస్వం నుండి.

వచన విభాగం:

1. యుగాంతం (కథానిక) - నెల్లూరి కేశవస్వామి - నెల్లూరి కేశవస్వామి ఉత్తమ కథల నుండి.
2. ఎంకన్న (కథానిక) - ఆచార్య పాకాల యశోదారెడ్డి - యశోదారెడ్డి ఉత్తమ కథల నుండి.
3. మూమిడిపందు (వ్యాసం) - సురవరం ప్రతాపరెడ్డి - సురవరం ప్రతాపరెడ్డి వ్యాసాలు అనే గ్రంథం నుండి.
4. మా ఊరు పోయింది (వ్యాసం) - దేవులపల్లి వేంకట కృష్ణశాస్త్రి - పుష్పలావికలు అనే వ్యాస సంపుటి నుండి.

భాషా విభాగం:

సంధులు :

1. సంస్కృత సంధులు - సవర్ణదీర్ఘసంధి, గుణసంధి, వృద్ధిసంధి, యణాదేశసంధి.
2. తెలుగు సంధులు - అత్వసంధి, ఇత్వసంధి, త్రికసంధి, గసదదవాదేశసంధి, రుగాగమసంధి, టుగాగమసంధి, ఆమ్రేడితసంధి, పుంప్వాదేశసంధి.

సమాసాలు:

తత్పురుష సమాసం, కర్మధారయ సమాసం, బహువ్రీహి సమాసం, ద్వంద్వ సమాసం, ద్విగు సమాసం.

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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

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పాఠ్య ప్రణాళిక - మూడవ సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - భాషా విభాగం - ఉపవాచకం

ప్రాచీన కవిత్వం:

1. ధర్మజుని వాక్చాతుర్యం - తిక్కన
2. విభీషణ శరణాగతి - గోనబుద్ధారెడ్డి
3. గుణనిధి కథ - శ్రీనాథుడు

ఆధునిక కవిత్వం:

1. గబ్బిలం - గుర్రం జాషువా (రైతుల ప్రశస్తి)
2. గురుదక్షిణ - అంబటి లక్ష్మి నరసింహరాజు
3. గుడిసెలు కాలిపోతున్నై - డా. బోయి భీమన్న

భాషా విభాగం - అర్థాలంకారాలు:

1. ఉపమ 2. రూపకం 3. ఉత్ప్రేక్ష 4. అర్థాంతరన్యాసం 5. శ్లేష

శబ్దాలంకారాలు:

1. వృత్యనుప్రాసం 2. ఛేకానుప్రాసం 3. లాటానుప్రాసం 4. అంత్యానుప్రాసం 5. యమకం

ఉపవాచకం -

చలిచీమలు (సాంఘిక నాటకం) - పి.వి. రమణ

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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

బి.ఏ./బి.కాం/బి.ఎస్సీ - సి.బి.సి.ఎస్ పద్ధతి - తెలుగు (ద్వితీయ భాష) 2018-19

పాఠ్య ప్రణాళిక - మూడవ సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - భాషా విభాగం - ఉపవాచకం

ప్రాచీన కవిత్వం:

1. ధర్మజుని వాక్చాతుర్యం - తిక్కన
2. విభీషణ శరణాగతి - గోనబుద్ధారెడ్డి
3. గుణనిధి కథ - శ్రీనాథుడు

ఆధునిక కవిత్వం:

1. గబ్బిలం - గుర్రం జాషువా (రైతుల ప్రశస్తి)
2. గురుదక్షిణ - అంబటి లక్ష్మి నరసింహరాజు
3. గుడిసెలు కాలిపోతున్నై - డా. బోయి భీమన్న

భాషా విభాగం - అర్థాలంకారాలు:

1. ఉపమ 2. రూపకం 3. ఉత్ప్రేక్ష 4. అర్థాంతరన్యాసం 5. శ్లేష

శబ్దాలంకారాలు:

1. వృత్త్యనుప్రాసం 2. ఛేకానుప్రాసం 3. లాటానుప్రాసం 4. అంత్యానుప్రాసం 5. యమకం

ఉపవాచకం -

చలిచీమలు (సాంఘిక నాటకం) - పి.వి. రమణ

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...rsity

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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి
బి.ఎ./బి.కాం/బి.ఎస్సీ - సి.బి.సి.ఎస్ పద్ధతి - తెలుగు (ద్వితీయ భాష) 2018-19
పాఠ్య ప్రణాళిక - మూడవ సెమిస్టర్
ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - భాషా విభాగం - ఉపవాచకం

ప్రాచీన కవిత్వం:

1. ధర్మజుని వాక్చాతుర్యం - తిక్కన
2. విభీషణ శరణాగతి - గోనబుద్ధారెడ్డి
3. గుణనిధి కథ - శ్రీనాథుడు

ఆధునిక కవిత్వం:

1. గబ్బిలం - గుర్రం జాషువా
2. గురుదక్షిణ - అంబటి లక్ష్మి నరసింహరాజు
3. గుడిసెలు కాలిపోతున్నై - డా. బోయి భీమన్న

(రైతుల ప్రశస్తి)

భాషా విభాగం - అర్థాలంకారాలు:

1. ఉపమ 2. రూపకం 3. ఉత్ప్రేక్ష 4. అర్థాంతరన్యాసం 5. శ్లేష

శబ్దాలంకారాలు:

1. వృత్యనుప్రాసం 2. ఛేకానుప్రాసం 3. లాటానుప్రాసం 4. అంత్యానుప్రాసం 5. యమకం

ఉపవాచకం -

చలిచీమలు (సాంఘిక నాటకం) - పి.వి. రమణ

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SANGAREDDY- 502 001.

Chairman
Studies in Telugu
University Hyderabad

Asst. Professor
Dept. of Telugu,
University

(9)

తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

బి.ఏ./బి.కాం/బి.ఎస్సీ - సి.బి.సి.ఎస్ పద్ధతి - తెలుగు (ద్వితీయ భాష) 2018-19

పాఠ్య ప్రణాళిక - నాలుగవ సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - భాషా విభాగం - ఉపవాచకం

ప్రాచీన కవిత్వం:

1. నారద గానమాత్సర్యం - పింగళి సూరన
2. వాగ్దాన భంగం - అనూరి మరింగంటి వేంకట నరసింహాచార్యులు
3. నారసింహ శతకం - ధర్మపురి శేషప్ప

ఆధునిక కవిత్వం:

1. నరుడ నేను, నరుడ నేను - కాళోజి
2. ఆర్తగీతం - దేవరకొండ బాలగంగాధర తిలక్
3. నగరంలో వాన - కుందుర్తి ఆంజనేయులు (దేవరకొండ దుర్గం)

వచన విభాగం:

1. అర్ధరాత్రి అరుణోదయం - దాశరథి రంగాచార్య
2. సి.పి.బ్రౌన్ సాహిత్య సేవ - జానుమద్ది హనుమచ్ఛాస్త్రి
3. మన గ్రామ నామాలు - డా. కపిలవాయి లింగమూర్తి
4. నివురు తొలగిన నిప్పు - పోల్కంపల్లి శాంతాదేవి
5. కొండమల్లెలు - ఇల్లిందల సరస్వతీదేవి

భాషా విభాగం - ఛందస్సు:

1. ఉత్పలమాల 2. చంపకమాల 3. మత్తేభం 4. శార్దూలం
5. ఆటవెలది 6. తేటగీతి 7. కందం 8. సీసం
9. ద్విపద

Dr. Darla Venkateswara Rao
Professor, Department of Telugu
School of Humanities
UNIVERSITY OF HYDERABAD
Hyderabad-500 046, T.S. India

PRINCIPAL
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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ), సంగారెడ్డి

బి.ఏ./బి.కాం/బి.ఎస్సీ - సి.బి.సి.ఎస్ పద్ధతి - తెలుగు (ద్వితీయ భాష) 2018-19

పాఠ్య ప్రణాళిక - నాలుగవ సెమిస్టర్

ప్రాచీన కవిత్వం - ఆధునిక కవిత్వం - భాషా విభాగం - ఉపవాచకం

ప్రాచీన కవిత్వం:

1. నారద గానమాత్సర్యం - పింగళి సూరన
2. వాగ్దాన భంగం - అనూరి మరింగంటి వేంకట నరసింహాచార్యులు
3. నారసింహ శతకం - ధర్మపురి శేషప్ప

ఆధునిక కవిత్వం:

1. నరుడ నేను, నరుడ నేను - కాళోజి
2. ఆర్తగీతం - దేవరకొండ బాలగంగాధర తిలక్
3. నగరంలో వాన - కుందుర్తి ఆంజనేయులు (దేవరకొండ దుర్గం)

వచన విభాగం:

1. అర్ధరాత్రి అరుణోదయం - దాశరథి రంగాచార్య
2. సి.పి.బ్రౌన్ సాహిత్య సేవ - జానుమద్ది హనుమచ్ఛాస్త్రి
3. మన గ్రామ నామాలు - డా. కపిలవాయి లింగమూర్తి
4. నివురు తొలగిన నిప్పు - పోల్కంపల్లి శాంతాదేవి
5. కొండమల్లెలు - ఇల్లిందల సరస్వతీదేవి

భాషా విభాగం - ఛందస్సు:

1. ఉత్పలమాల 2. చంపకమాల 3. మత్తేభం 4. శార్దూలం
5. ఆటవెలది 6. తేటగీతి 7. కందం 8. సీసం
9. ద్విపద

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2019-2020

SUBJECT: TELUGU

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	26	NIL	
2			II	26	NIL	
3	B.A., B.COM., B.SC.	II	III	25	NIL	
			IV	25	NIL	
4	B.A., B.COM., B.SC.	III	-	NIL	NIL	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			122	NIL	

Total Number of Programmes : 122

Total Number of Courses : NIL

Percentage of Revision : NO CHANGE

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2019-2020

SUBJECT: TELUGU

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	26	NIL	
2			II	26	NIL	
3	B.A., B.COM., B.SC.	II	III	25	NIL	
			IV	25	NIL	
4	B.A., B.COM., B.SC.	III	-	NIL	NIL	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			122	NIL	

Total Number of Programmes : 122

Total Number of Courses : NIL

Percentage of Revision : NO CHANGE

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2020-2021

SUBJECT: TELUGU

Sl No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	41	41	
2			II	41	41	
3	B.A., B.COM., B.SC.	II	III	26	26	
			IV	26	NIL	
4	B.A., B.COM., B.SC.	III	-	NIL	NIL	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			154	67	

Total Number of Programmes : 154

Total Number of Courses : 67

Percentage of Revision : 43.5

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

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2020-2021

తారా ప్రభుత్వ డిగ్రీ కళాశాల సంగారెడ్డి

బి.ఏ/బి.కాం/బి.ఎస్సీ-సి.బి.సి.ఎస్ పద్ధతి-(ద్వితీయ భాష)2020-2021

పాఠ్య ప్రణాళిక-మొదటి సెమిస్టర్

ప్రాచీన కవిత్వం-ఆధునిక కవిత్వం -ఉపవాచకం-వ్యాకరణము

I. ప్రాచీన కవిత్వం:

1.శకుంతలోపాఖ్యానము -ఆంధ్రమహాభారతము -ఆదిపర్వంలోని చతుర్థాశ్వాసము

2. గోడగూచి -పాల్కురికి సోమనాథుడు-బసవపురాణం-తృతీయాశ్వాసము

3.ప్రవరుడు-అల్లసాని పెద్దన -మనుచరిత్ర-ప్రథమాశ్వాసము

II. ఆధునిక కవిత్వం :

1.కాసులు -గురజాడ అప్పారావు-గురజాడ రచనలు

2.రాజు -కవి-గుర్రం జాషువా-కొత్తలోకం

3.గంగిరెద్దు-డా.పల్లా దుర్గయ్య -గంగిరెద్దు కావ్యం

4.జయభేరి-శ్రీశ్రీ (శ్రీరంగం శ్రీనివాసరావు)-మహాప్రస్థానం

III. ఉపవాచకము:

1. రుద్రమదేవి నవల-ఒద్దిరాజు సీతారామ చంద్రరాయశర్మ

IV. వ్యాకరణము

1.పర్యాయపదాలు

2.నానార్థాలు

3.సంధులు

4.సమాసములు

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2020-2021

తారా ప్రభుత్వ డిగ్రీ కళాశాల సంగారెడ్డి

బి.ఏ/బి.కాం/బి.ఎస్సీ-సి.బి.సి.ఎస్ పద్ధతి-(ద్వితీయ భాష)2020-2021

పాఠ్య ప్రణాళిక-మొదటి సెమిస్టర్

ప్రాచీన కవిత్వం-ఆధునిక కవిత్వం -ఉపవాచకం-వ్యాకరణము

I. ప్రాచీన కవిత్వం:

1.శకుంతలోపాఖ్యానము -ఆంధ్రమహాభారతము -ఆదిపర్వంలోని చతుర్థాశ్వాసము

2. గోడగూచి -పాల్కురికి సోమనాథుడు-బసవపురాణం-తృతీయాశ్వాసము

3.ప్రవరుడు-అల్లసాని పెద్దన -మనుచరిత్ర-ప్రథమాశ్వాసము

II. ఆధునిక కవిత్వం :

1.కాసులు -గురజాడ అప్పారావు-గురజాడ రచనలు

2.రాజు -కవి-గుర్రం జాషువా-కొత్తలోకం

3.గంగిరెద్దు-డా.పల్లా దుర్గయ్య -గంగిరెద్దు కావ్యం

4.జయభేరి-శ్రీశ్రీ (శ్రీరంగం శ్రీనివాసరావు)-మహాప్రస్థానం

III. ఉపవాచకము:

1. రుద్రమదేవి నవల-ఒద్దిరాజు సీతారామ చంద్రరాయశర్మ

IV. వ్యాకరణము

1.పర్యాయపదాలు

2.నానార్థాలు

3.సంధులు

4.సమాసములు

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తారా ప్రభుత్వ డిగ్రీ కళాశాల(స్వ) సంగారెడ్డి

బి.ఏ /బి.కాం/బి.ఎస్సీ-సి.బి.సి.ఎస్ పద్ధతి -తెలుగు(ద్వితీయ భాష)2020-2021

పాఠ్య ప్రణాళిక-రెండవ సెమిస్టర్

ప్రాచీన కవిత్వం-ఆధునిక కవిత్వం- వచన విభాగం-ఛందస్సు

ప్రాచీన కవిత్వం:

1.గజేంద్ర మోక్షము - బమ్మెర పోతన - ఆంధ్ర మహాభాగవతం లోని అష్టమ స్కంధము నుండి

2.హనుమత్సందేశము - మొల్ల - రామాయణంలోని సుందర కాండము నుండి

3.సుభాషితములు - వినుగు లక్ష్మణ కవి - భర్తృహరి సుభాషిత త్రిశతి నుండి.

ఆధనిక కవిత్వం

1.స్నేహలత లేఖ - రాయప్రోలు సుబ్బారావు

2.పల్లెటూరి పిల్లగాడా - సుద్దాల హనుమంతు - "పల్లెటూరి పిల్లగాడా " అనే సంకలనం నుండి.

3.ప్రపంచపదులు - డా.సి. నారాయణ రెడ్డి - ప్రపంచపదులు అనే గ్రంథం నుండి.

4.అల్విదా - కొముది - అల్విదా కవితా సర్వస్వం నుండి.

వచన విభాగం:

1.యుగాంతం (కథానిక) - నెల్లూరి కేశవస్వామి - నెల్లూరి కేశవస్వామి ఉత్తమ కథల నుండి.

2.ఎంకన్న (కథానిక) - ఆచార్య పాకాల యశోదా రెడ్డి - యశోదా రెడ్డి ఉత్తమ కథల నుండి

3.మామిడిపండు(వ్యాసం) -సురవరం ప్రతాపరెడ్డి - సురవరం ప్రతాపరెడ్డి వ్యాసాలు అనే గ్రంథం నుండి.

4.మా ఊరు పోయింది (వ్యాసం) - దేవులపల్లి వేంకట కృష్ణశాస్త్రి - పుష్పలావికలు అనే వ్యాస సంపుటి నుండి.

ఛందస్సు:

1.ఉత్పలమాల 2.చంపకమాల

3.మత్తేభం 4.శార్దూలం 5.ఆటవెలది 6.తేటగీతి 7.కందం 8.సీసం 9.ద్విపద

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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ) సంగారెడ్డి

బి.ఏ/బి.కాం/బి.ఎస్సీ-సి.బి.సి.ఎస్ పద్ధతి - (ద్వితీయ భాష) 2020-21

ప్రాచీన కవిత్వం-ఆధునిక భాషావిభాగం -అలంకారాలు

I. ప్రాచీన కవిత్వం

1.ధర్మజుని వాక్చాతుర్యం - తిక్కన

2.విభీషణ శరణాగతి -గోనబుద్ధారెడ్డి

3.గుణనిధి కథ - శ్రీనాథుడు

II. ఆధునిక కవిత్వం

1.కాపుబిడ్డ -గంగుల కాయిరెడ్డి

2.గురుదక్షిణ - అంబటి లక్ష్మీ నరసింహరాజు

3.గుడిసెలు కాలిపోతున్నై -డా.బోయి భీమన్న

III. భాషా విభాగం -అర్థాలంకారాలు

1.ఉపమ 2 రూపకం 3 ఉత్ప్రేక్ష 4.అర్థాంతన్యాసం

5.శ్లేష 6.దృష్టాంతం

IV. శబ్దాలంకారాలు

1.వృత్యానుప్రాసము 2.ఛేకానుప్రాసము 3.లాటానుప్రాసము

4.అంత్యానుప్రాసము

5.యమకము

6.ముక్తపదగ్రస్తము

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(13)

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తారా ప్రభుత్వ డిగ్రీ కళాశాల (స్వ) సంగారెడ్డి

బి.ఏ/బి.కాం/బి.ఎస్సీ-సి.బి.సి.ఎస్ పద్ధతి - (ద్వితీయ భాష) 2020-21

ప్రాచీన కవిత్వం-ఆధునిక భాషావిభాగం -అలంకారాలు

I. ప్రాచీన కవిత్వం

1.ధర్మజుని వాక్చాతుర్యం - తిక్కన

2.విభీషణ శరణాగతి -గోనబుద్ధారెడ్డి

3.గుణనిధి కథ - శ్రీనాథుడు

II. ఆధునిక కవిత్వం

1.కాపుబిడ్డ -గంగుల కాయిరెడ్డి

2.గురుదక్షిణ - అంబటి లక్ష్మీ నరసింహరాజు

3.గుడిసెలు కాలిపోతున్నై -డా.బోయి భీమన్న

III. భాషా విభాగం -అర్థాలంకారాలు

1.ఉపమ 2 రూపకం 3 ఉత్ప్రేక్ష 4.అర్థాంతన్యాసం

5.శ్లేష 6.దృష్టాంతం

IV. శబ్దాలంకారాలు

1.వృత్యానుప్రాసము 2.ఛేకానుప్రాసము 3.లాటానుప్రాసము

4.అంత్యానుప్రాసము

5.యమకము

6.ముక్తపదగ్రస్తము

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2021-2022

SUBJECT: TELUGU

Sl No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	41	NIL	
2			II	41	NIL	
3	B.A., B.COM., B.SC.	II	III	41	NIL	
			IV	41	NIL	
4	B.A., B.COM., B.SC.	III	V	26	26	
			VI	26	26	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			236	52	

Total Number of Programmes : 236

Total Number of Courses : 52

Percentage of Revision : 22.0

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head

Department of Telugu

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Telangana- India

B.A., B.COM., B.SC.
Syllabus Revision for the Year: 2021-2022

SUBJECT: TELUGU

Sl No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	B.A., B.COM., B.SC.	I	I	41	NIL	
2			II	41	NIL	
3	B.A., B.COM., B.SC.	II	III	41	NIL	
			IV	41	NIL	
4	B.A., B.COM., B.SC.	III	V	26	26	
			VI	26	26	
5	M.A. - TELUGU	I	I	5	NIL	
			II	5	NIL	
6	M.A. - TELUGU	II	III	5	NIL	
			IV	5	NIL	
	Total			236	52	

Total Number of Programmes : 236

Total Number of Courses : 52

Percentage of Revision : 22.0

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head

Department of Telugu

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TARA GOVERNMENT DEGREE & P.G. COLLEGE (AUTONOMOUS),SANGAREDDY

B.A., B. SC., B. COM., & B.B.A. 5th Semester Second Language Telugu

సెమిస్టర్ – V

I. కవితా ప్రక్రియలు

1. పద్యం
2. పాట
3. వచన కవిత
4. లఘు కవితా రూపాలు
5. ఉర్దూ కవితా రూపాలు

II. తెలుగు వ్యాసం

6. వ్యాసం
7. వ్యాస పరిణామం
8. వ్యాస రచన పద్ధతులు
9. వ్యాసంలో వస్తు వైవిధ్యం
10. వ్యాస రచనలో భాషా ప్రయోగాలు

III. వచన సాహిత్యం

11. అధ్యయన సంస్కృతి
12. సాహిత్య అధ్యయనం, ప్రయోజనాలు
13. ముందుమాట
14. పుస్తక సమీక్ష
15. జానపదం

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B.A., B. SC., B. COM., & B.B.A. 6th Semester Second Language Telugu

సెమిస్టర్ – VI

I. సాహిత్య ప్రక్రియల పరిచయం

1. నాటకం
2. నవల
3. కథానిక
4. జీవిత చరిత్ర
5. ఉపన్యాస కళ

II. జర్నలిజంలో మౌలికాంశాలు

6. వార్త
7. వార్త నిర్మాణం
8. వార్త కథనాలు
9. ఇంటర్వ్యూ
10. అనువాదం

III. ప్రాజెక్ట్ పరిచయం

11. ప్రాజెక్ట్
12. అధ్యయనం
13. పరికల్పన
14. నివేదిక

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

BA (MODERN LANGUAGE)
Syllabus Revision for the Year: 2017-2018

SUBJECT: TELUGU - MODERN LANGUAGE

Sl No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/HPT/ML- I TELUGU	I	I	1	NIL	
2			II	1	NIL	
3	BA/HPT/ML- I TELUGU	II	III	1	1	
			IV	1	1	
4	BA/HPT/ML- I TELUGU	III	V	-	-	
			VI	-	-	
	Total			4	2	

Total Number of Programmes : 4

Total Number of Courses : 2
Percentage of Revision : 50

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

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2017-18 17

ఉస్మానియా విశ్వవిద్యాలయం - హైదరాబాద్

ఎం.ఏ ద్వితీయ - పాఠ్యప్రణాళిక

మోడ్రన్ లాంగ్వేజ్ - తెలుగు పేపర్ - 2

3వ సెమిస్టర్

తెలుగు సాహిత్య చరిత్ర - ప్రాచీన యుగం

i. సాహిత్య చరిత్ర అధ్యయన ప్రయోజనం - యుగవిభజన తీరు

ప్రాఙ్నన్నయ యుగం

కవిత్రయ యుగం - భారతం ఇతర రచనలు

ii. శివకవుల యుగం - పాల్కురికి సోమనాథుడు

కావ్యయుగం - శ్రీనాథుడు - పోతన

iii. ప్రబంధ యుగ లక్షణాలు - విశేషాలు

అష్టదిగ్గజ కవుల పరిచయం.. వివరంగా తెలుసుకోవల్సిన కవులు -

పెద్దన, తిమ్మన, శ్రీకృష్ణ దేవరాయలు, ధూర్జటి, రామరాజభూషణుడు,మొదలైన వారు

iv. వచకవులు : అన్నమయ్య, త్యాగయ్య, రామదాసు, రాకమచర్ల వెంకటదాసు,

పోతులూరి వీరబ్రహ్మం

v. శతక సాహిత్య పరిచయం - సుమతి, వేమన, ధర్మపురి శేషప్ప, దాశరథి శతకాలు

యక్షగానాలు - చర్వితాల బాగయ్య

ఆధార గ్రంథాలు :

1 ఆంధ్ర సాహిత్య చరిత్ర సంగ్రహం - ఆచార్య ఖండవల్లి లక్ష్మీరంజని

2 తెలుగు సాహిత్య సమీక్ష : 1, 2 భాగాలు - ఆచార్య జి. నాగయ్య

3 ఆంధ్ర వాగ్మయ చరిత్ర- ఆచార్య దివాకర్ల వేంకటావధాని

4 ఆంధ్ర సాహిత్య చరిత్ర - పింగళి లక్ష్మీకాంతం

5 సామాజిక చారిత్రమ నేపథ్యంలో తెలుగు సాహిత్య చరిత్ర - డాక్టర్ ముదిగంటి సుజాతరెడ్డి

6 తెలంగాణ సాహిత్య చరిత్ర - ఆచార్య ఎన్.వి. రామారావు

7 తెలుగు సాహిత్య చరిత్ర - డాక్టర్ వెలమల సిమ్మన్న

8 ముంగిలి- డాక్టర్ సుంకిరెడ్డి నారాయణరెడ్డి

HEAD
DEPT. OF TELUGU
OSMANIA UNIVERSITY
HYDERABAD - 500 007

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Professor, Department of Telugu
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AUTONOMOUS
SANGAREDDY- 502 00

ఉస్మానియా విశ్వవిద్యాలయం - హైదరాబాద్

బిఎ ద్వితీయ - పాఠ్యప్రణాళిక

మోడ్రన్ లాంగ్వేజ్ - తెలుగు పేపర్ - 2

4వ సెమిస్టర్

తెలుగు సాహిత్య చరిత్ర - ఆధునిక యుగం

i. 1. సమగ్ర పరిచయం

1 ఆధునికత నేపథ్యం 2 కందుకూరి వీరేశలింగం 3 గురజాడ వెంకటఅప్పారావు
4 విశ్వనాథ సత్యనారాయణ 5 గుర్రం జాషువ 6 శ్రీశ్రీ

ii.1 మాడపాటి హనుమంతరావు 2 సురవరం ప్రతాపరెడ్డి 3 కాళోజి నారాయణరావు
4 దాశరథి కృష్ణమాచార్యులు 5 సి. నారాయణ రెడ్డి

iii. నవల

1 వట్టికోట ఆళ్వార్ స్వామి 2 భాస్కరభట్ల కృష్ణారావు 3 యం.వి. తిరుపతయ్య
4 దాశరథి రంగాచార్య 5 నవీన్

iv. కథ

1 శ్రీపాద సుబ్రహ్మణ్యశాస్త్రి 2 మధురాంతకం రాజారాం 3 నెల్లూరి కేశవస్వామి
4 గూడూరి సీతారాం

v. నాటకం

1 పి.వి. రమణ 2 సుంకర సత్యనారాయణ 3 కెవైఎల్ నర్సింహారావు

ఆధార గ్రంథాలు :

1 ఆంధ్ర సాహిత్య చరిత్ర సంగ్రహం - ఆచార్య ఖండవల్లి లక్ష్మీరంజని
2 తెలుగు సాహిత్య సమీక్ష : 1, 2 భాగాలు - ఆచార్య జి. నాగయ్య
3 ఆంధ్ర వాఙ్మయ చరిత్ర- ఆచార్య దివాకర్ల వేంకటావధాని
4 ఆంధ్ర సాహిత్య చరిత్ర - పింగళి లక్ష్మీకాంతం
5 సామాజిక చారిత్రమ నేపథ్యంలో తెలుగు సాహిత్య చరిత్ర - డాక్టర్ ముదిగంటి సుజాతారెడ్డి
6 తెలంగాణ సాహిత్య చరిత్ర - ఆచార్య ఎస్.వి. రామారావు
7 తెలుగు సాహిత్య చరిత్ర - డాక్టర్ వెలమల సిమ్మన్న
8 ముంగిలి- డాక్టర్ సుంకిరెడ్డి నారాయణరెడ్డి
9 తెలంగాణ కథావికాసం - సం: డాక్టర్ పతంగి వెంకటేశ్వర్లు
10 తెలంగాణ నాటక వికాసం - సం: డాక్టర్ పతంగి వెంకటేశ్వర్లు
11 తెలంగాణ నవలా వికాసం - సం: డాక్టర్ పతంగి వెంకటేశ్వర్లు

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Chairman
Board of Studies in Telugu
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Osmania University

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

BA (MODERN LANGUAGE)
Syllabus Revision for the Year: 2018-2019

SUBJECT: TELUGU - MODERN LANGUAGE

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/HPT/ML- I TELUGU	I	I	1	NIL	
2			II	1	NIL	
3	BA/HPT/ML- I TELUGU	II	III	1	NIL	
			IV	1	NIL	
4	BA/HPT/ML- I TELUGU	III	V	1	1	
			VI	1	1	
	Total			6	2	

Total Number of Programmes : 6

Total Number of Courses : 2
Percentage of Revision : 33.33

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
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TARA Govt Degree College (A), Sangareddy

Osmania University, Hyderabad.

CBCS Pattern of B.A.,

Syllabus

Telugu (Modern Language) - Paper -5

5th Semester

వ్యాకరణం - ఛందస్సు - అలంకారాలు

I. సంజ్ఞా పరిచ్ఛేదం, సమాస పరిచ్ఛేదం - చిన్నయసూరి బాల వ్యాకరణం నుండి.

II. సంధి పరిచ్ఛేదం

III. వాక్య పరిచ్ఛేదం - బహుజనపల్లి సీతారామానుజాచార్యులు - ప్రౌఢ వ్యాకరణం నుండి

IV. ఛందస్సు

1. దశవిధ యతులు - స్వర, వర్గ, అఖండ, ప్రౌది, బిందు, ప్లుత, సంయుక్తాక్షర, ఎక్కటి, పోలిక, సరస యతులు
2. షడ్విధ ప్రాసలు - సుకర, దుష్కర, ద్వి, త్రి, అను, అంత్య ప్రాసలు.

V. అలంకారాలు

ఉపమ, ఉత్ప్రేక్ష, రూపకం, అర్థాంతరన్యాసం, దృష్టాంతం, శ్లేష, ఉల్లేఖ, అతిశయోక్తి, యమకం, ఛేకానుప్రాస, లాటానుప్రాస, వృత్త్యనుప్రాస, ముక్తపదగ్రస్తం.

(నిత్యజీవితంలోనివి, ఆధునిక కవిత్వంలోనివి ఉదాహరణలుగా ఇచ్చేలా విద్యార్థులు స్వతంత్రంగా అలంకార యుత వాక్యం రాయడానికి ప్రేరణ కలిగేలా అధ్యాపకులు ప్రయత్నించాలి.)

ఆధార గ్రంథాలు

1. బాల వ్యాకరణం - పరవస్తు చిన్నయసూరి
2. ప్రౌఢ వ్యాకరణం - బహుజనపల్లి సీతారామానుజాచార్యులు
3. కవిజనాశ్రయం - మల్లియ రేచన.

Dr. Darla Venkateswara Rao
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TARA Govt. Degree College (A) Sangareddy

Osmania University, Hyderabad.

CBCS Pattern of B.A.,

Syllabus

Telugu (Modern Language) - Paper - 6

5 th Semester

ప్రాచీన సాహిత్య విమర్శ

I. కావ్య నిర్వచనములు

II. కావ్య ప్రయోజనాలు, కావ్య హేతువులు

III. కావ్యాత్మ

IV. రస సిద్ధాంతం – నిర్వచనం; రస సంఖ్య – రసము స్థాయీ భావాలు; రస నిష్ప

V. శబ్ద వృత్తులు – అభిద, లక్షణ, వ్యంజన

ఆధార గ్రంథాలు

1. సాహిత్య శిల్ప సమీక్ష – పింగళి లక్ష్మీకాంతం
2. సాహిత్య సోపానములు – దివాకర్ల వేంకటావధాని
3. తెలుగులో సాహిత్య విమర్శ – ఎన్.వి. రామారావు
4. విమర్శ – మౌలిక లక్షణాలు – ముదిగొండ వీరభద్రయ్య

TARA Govt. Degree College (A) Sangareddy

Osmania University, Hyderabad.

CBCS Pattern of B.A.,

Syllabus

Telugu (Modern Language) - Paper - 6

5 th Semester

ప్రాచీన సాహిత్య విమర్శ

I. కావ్య నిర్వచనములు

II. కావ్య ప్రయోజనాలు, కావ్య హేతువులు

III. కావ్యాత్మ

IV. రస సిద్ధాంతం – నిర్వచనం; రస సంఖ్య – రసము స్థాయీ భావాలు; రస నిష్ప

V. శబ్ద వృత్తులు – అభిద, లక్షణ, వ్యంజన

ఆధార గ్రంథాలు

1. సాహిత్య శిల్ప సమీక్ష – పింగళి లక్ష్మీకాంతం
2. సాహిత్య సోపానములు – దివాకర్ల వేంకటావధాని
3. తెలుగులో సాహిత్య విమర్శ – ఎన్.వి. రామారావు
4. విమర్శ – మౌలిక లక్షణాలు – ముదిగొండ వీరభద్రయ్య

TARA Govt. Degree College (A). Sangareddy

Osmania University, Hyderabad.

CBCS Pattern of B.A.,

Syllabus

Telugu (Modern Language) - Paper - VI

6th Semester

తెలుగు భాషా చరిత్ర

I. 1. ఆంధ్రము – తెనుఁగు – తెలుఁగు – తెలంగాణ శబ్దాల వ్యుత్పత్తి – వ్యాప్తి.

2. ద్రావిడ భాషలు, ద్రావిడ భాషల్లో తెలుగు స్థానం.

II. తెలుగులో మాండలిక విజ్ఞానం – మాండలిక భేదాలు

తెలంగాణ భాషా స్వరూపం – కుల, వృత్తి మాండలికాలు.

III. ధ్వని పరిణామం – వర్ణ సమీకరణం, వర్ణ విభేదం, వర్ణ వ్యత్యయం, వర్ణ సామ్యం, తాలవ్యీకరణం. శ్వాసత – నాదత మొదలైనవి.

IV. అర్థ విపరిణామం – అర్థ సంకోచం, అర్థ వ్యాకోచం, సభ్యోక్తి, అర్థాపకర్ష, లోక నిరుక్తి మొ॥

V. 1. అన్యదేశ్యాలు – తెలుగులో ఉర్దూ, ఆంగ్ల, తమిళ, కన్నడ, ఫారసి, పోర్చుగీసు మొ॥ భాషాపదాలు ప్రవేశించిన తీరు (తెలంగాణ ప్రాంతీయ ఉదాహరణలు కూడా ఇవ్వడానికి అధ్యాపకులు ప్రయత్నించాలి)

2. ఆదాన – ప్రదానాలు.

ఆధార గ్రంథాలు

1. తెలుగు భాషా చరిత్ర – సం॥ భద్రిరాజు కృష్ణమూర్తి
2. తెలుగు భాషా చరిత్ర – ప్రొ. వెలమల సిమ్మన్న.

TARA Govt. Degree College (A), Sangareddy

Osmania University, Hyderabad.

CBCS Pattern of B.A.,

Syllabus

Telugu (Modern Language) - Paper - 8

6th Semester

ఆధునిక సాహిత్య విమర్శ

I. విమర్శ నిర్వచనం - ఉత్తమ విమర్శ స్వరూపం
   తెలుగు విమర్శ పరిణామం

II. విమర్శ లక్షణాలు, విమర్శ భేదాలు - ఆలంకారిక, స్వతంత్ర, గ్రంథ పరిష్కరణ, తులనాత్మక, చారిత్రక, కళాతత్వ, మనోవిశ్లేషణాత్మక, మార్క్సిస్ట్ మొదలైనవి

III. కథానిక లక్షణాలు - పరిణామం - భేదాలు

IV. వ్యాస స్వరూపం - పరిణామం - భేదాలు

V. నవలా లక్షణాలు - పరిణామం - భేదాలు

ఆధార గ్రంథాలు

1. సాహిత్య శిల్ప సమీక్ష - పింగళి లక్ష్మీకాంతం
2. సాహిత్య సోపానములు - దివాకర్ల వేంకటావధాని
3. తెలుగులో సాహిత్య విమర్శ - ఎస్.వి. రామారావు
4. విమర్శ - మౌలిక లక్షణాలు - ముదిగొండ వీరభద్రయ్య

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(25)

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

BA (MODERN LANGUAGE)
Syllabus Revision for the Year: 2019-2020

SUBJECT: TELUGU - MODERN LANGUAGE

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/HPT/ML- I TELUGU	I	I	1	NIL	
2			II	1	NIL	
3	BA/HPT/ML- I TELUGU	II	III	1	NIL	
			IV	1	NIL	
4	BA/HPT/ML- I TELUGU	III	V	1	NIL	
			VI	1	NIL	
	Total			6	NIL	

Total Number of Programmes : 6

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

(25)

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)
Telangana- India

BA (MODERN LANGUAGE)
Syllabus Revision for the Year: 2019-2020

SUBJECT: TELUGU - MODERN LANGUAGE

SL No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/HPT/ML- I TELUGU	I	I	1	NIL	
2			II	1	NIL	
3	BA/HPT/ML- I TELUGU	II	III	1	NIL	
			IV	1	NIL	
4	BA/HPT/ML- I TELUGU	III	V	1	NIL	
			VI	1	NIL	
	Total			6	NIL	

Total Number of Programmes : 6

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head :

Department of Telugu

PRINCIPAL
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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

[redacted]: HINDI

Syllabus Revision for the Year:2017-2018

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	11	NIL	
2			II	11	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	14	14	
			IV	14	14	
4	BA/B.COM/B.SC - HINDI	III	-	-	-	
	Total			50	28	

Total Number of Programmes : 50

PRINCIPAL
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SANGAREDDY-502 001

Total Number of Courses : 28

Percentage of Revision :56.0

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

Department of Hindi

PRINCIPAL
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(AUTONOMOUS)
SANGAREDDY-502 001

B.A., B.COM., B.SC., THIRD SEMESTER HINDI SECOND LANGUAGE
OSMANIA UNIVERSITY W.ef. 2017-2018

First Unit - KAVYA NIDHI

1. Kabeer Das	Kabeer Ke Dohe
2. Soor Das	Baal Leela
3. Tulasi Das	Tulasi Das Ke Dohe

Second Unit - KAVYA NIDHI

1. Maithilisharan Gupt	Navayuvakon Se
2. Ayodhya Singh Upadhyaya 'Harioudh'	Phool Aur Kaanta
3. Jai Shankar Prasad	Bharat

Third Unit – KAVYANIDHI

1. Sumitranandan Pant	Jeewan Ka Adhikar
2. Subhadra Kumari Chauhan	Mera Nayaa Bachpan

Fourth Unit

Hindi Sahitya Ka Itihas: Main tendencies of the following ages:

1) Aadi kaal: Naamkaran, Paristhitiyaan, Pravrittiyaan
2) Bhakti kaal: Naamkaran, Paristhitiyaan, Pravrittiyan

Hindi Sahitya Ka Itihas: Brief Study of the following authors and poets-

Chand Bardaai
Kabeer Das
Soor Das
Tulasi Das
Jai Shankar Prasad
Sumitranandan Pant
Bharatendu Harishchandra
Maithilisharan Gupt
Ramdhari Singh 'Dinkar'

Fifth Unit

General essay on socio-political and literary subjects:

Sahitya Aur Sammaj
Vidyaarthi Aur Rajneeti
Vigyaan : Vardaan Yaa Abhishaap
Samaaj Mein Naari Kaa Sthaan
Adhunik Shikshaa Aur Naari
Shikshaa Par Bhoomandalikaran Kaa Prabhaav
Jeewan Mein Swachchataa Kaa Mahatva

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(AUTONOMOUS)
SANGAREDDY-502 001

Translation from English or Telugu to Hindi:

-:Reference Books:-

- Hindi Sahitya Kaa Ithihas- Professor T. Mohan Singh
- Hindi Sahitya Kaa Sankshipt Ithihas- Dr. Vidyasagar dayal
- Hindi Sahitya Kaa Sankshipt Ithihas- Dr. Tej Narayan Jaiswal
- Hindi Sahitya Kaa Subodh Ithihas – Gulab Rai

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Govt. Degree College for Women
Sangareddy, Medak Dist.

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Asst. Prof.
Government

SYALLABUS FOR
B.A., B.COM., B.SC., FOURTH SEMESTER HINDI SECOND LANGUAGE
OSMANIA UNIVERSITY W.ef. 2017-2018

First Unit – KAVYA NIDHI

1. Meera Bai	Meera Ke Pad
2. Raheem	Raheem Ke Dohe
3. Bihaari	Bihari Ke Dohe

Second Unit – KAVYA NIDHI

1. Soorya Kant Tripathi 'Nirala'	Bhagwan Buddh Ke Prati
2. Mahadevi Varma	Ve Muskaate Phool Nahin
3. Ramdhari Singh ''Dinkar'	Kalam Aur Talwaar

Third Unit – KAVYA NIDHI

1. Harivansh Rai Bachchan	To Kyon Baith Gayaa Hai Path Par
2. Agyeya	Anubhav Paripakva

Fourth Unit

Hindi Sahitya Ka Itihas: Main tendencies of the following ages:

3) Shringaar Kaal: Naamkaran, Paristhitiyaan, Pravrittiyaan
4) Aadhunik Kaal:
   a) Bhartendu Yug, Dwivedi Yug, Chchyaawaad, Pragatiwaad, Prayogwaad.
   b) Hindi Gadya Kaa Vikaas, Hindi Kahaani, Upanyaas Aur Naatak.

Brief study of the following authors and poets:

Meera Bai	Raheem	Bihari
Mahaveer Prasad Dwivedi	Premchand	Nirala
Mahadevi Varma	Harivansh Rai Bachchan	Agyeya

Fifth Unit

Essays on general topics:

Vidyaarthi Aur Anushaasan
Aaj Ki Shiksha Neeti
Bharat Mein Berozgaari Ki Samasyaa
Paryaavaran aur Pradooshan
Bharat mein Badhati huyi jan Sankhyaa
Bharatiya Sanskriti

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

Comprehension

-:Reference Books:-

- Hindi Sahitya Kaa Ithihas- Professor T. Mohan Singh
- Hindi Sahitya Kaa Sankshipt Ithihas- Dr. Vidyasagar Dayal
- Hindi Sahitya Kaa Sankshipt Ithihas- Dr. Tej Narayan Jaiswal
- Hindi Sahitya Kaa Subodh Ithihas – Gulab Rai

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

[redacted]: HINDI

Syllabus Revision for the Year:2018-2019

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	15	NIL	
2			II	15	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	11	NIL	
			IV	11	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			52	NIL	

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

Total Number of Programmes : 52

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

Department of Hindi

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

[redacted] HINDI

Syllabus Revision for the Year:2019-2020

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	16	16	Chapter-1 Changed
2			II	16	16	Chapter-1 Changed
3	BA/B.COM/B.SC - HINDI	II	I	15	NIL	
			II	15	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			62	32	

PRINCIPAL
TARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

Total Number of Programmes : 62

Total Number of Courses : 32

Percentage of Revision :51.6

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

Department of Hindi

PRINCIPAL
GARA GOVT COLLEGE
(AUTONOMOUS)
SANGAREDDY-502 001

DEPARTMENT OF HINDI
TARA GOVERNMENT COLLEGE SANGAREDDY (A)
CHOICE BASED CREDIT SYSTEM
BA/BCOM/BSC 2019-2020
SECOND LANGUAGE HINDI SYLLABUS

Semester I — 5 Credits — 5 hours of instruction per week

First Unit - GADYA DARPAN

1. Chantra Sangathan — Babu Gulaab Raai
2. Baazaar darshan — Jainendra Kumar

Second Unit - GADYA DARPAN

1. Bhaabhi — Mahadevi Varma
2. Bharat mein Saanskriti Sangam — Ramdhari Singh 'Dinkar'
3. Raashtra kaa Swaroop — Vasudev Sharan Agrawal

Third Unit - KATHAASINDHU

1. Sadgati — Premchand
2. Dukh — Yashpal
3. Sach Kaa Saudaa — Sudarshan

Fourth Unit - KATHAASINDHU

1. Praayashchitt — Bagwati Charan Varma
2. Chief Ki Daawat — Bheeshma Saahani

Fifth Unit - GRAMMAR

1. Rewriting of sentences as directed based on Gender, Number Tense, Case & Voice.
2. Correction of Sentences.
3. Usages of words into Sentences.
4. Official Hindi, Administrative Terminology (Prashaasnik Shabdaavali) Official Designations (Padnaam)
   a) Translation of Hindi words into English.
   b) Translation of English words into Hindi.

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SANGAREDDY-502 001

:- Reference books recommended by the committee :-

Saral Hindi Vyaakaran: Dakshin Bharat Hindi Prachaar Sabhaa.
Hindi Vyaakaran : Shyam Chandra Kapoor.
Prathamik Vyaakaran evam Rachanaa : Harish Chandra.

Dr. N. MAHADEVI
Chairperson
Board of Studies
Department of Hindi
Osmania University, Hyderabad-7

29/2/2020

DEPARTMENT OF HINDI

TARA GOVERNMENT COLLEGE SANGAREDDY (A)

CHOICE BASED CREDIT SYSTEM

BA/BCOM/BSC

SECOND LANGUAGE HINDI SYLLABUS 2019 -2020

Semester II **5 Credits** **5 hours of Instruction per week**

First Unit - GADYA DARPAN

1. Dharati kaa swarg	Vishnu Prabhakar
2. Taayee	Vishwambharnath Sharma 'Kaushik'

Second Unit - GADYA DARPAN

1. Rajneeti kaa bantwaaraa	Harishankar Parsaai
2. Swami Vivekaanand	Vamshidhar Vidyaalankar
3. Paryaavaran aur hum	Rajeev Garg

Third Unit - KATHAA SINDHU

1. Nasha	Prem Chand
2. Gadal	Raangeya Raaghav
3. Hansoo Yaa Roun	Vinayak Rao Vidyaalankar

Fourth Unit - KATHAA SINDHU

1. Waapasi	Usha Priyamwadaa
2. Sevaa	Mamataa Kaaliyaa
3. Siliyaa	Susheelaa Takbhore

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Fifth Unit - GRAMMAR

1. Sandhi Vichched
2. Antonyms (Vilom Shabd)
3. Letter Writing : Personal Letters, Official Letters, Letter of Complaints, Application for Appointment.

Dr. V. [illegible] DEVI 2020
Chairperson
Board of Studies
Department of Hindi
Osmania University

20/2/2020

Dr. SHYAMRAO RATHOD
Associate Professor & Head
Department of Hindi
School of Literary Studies
English and Foreign Languages University
Hyderabad 500007 (India)

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

[redacted] HINDI

Syllabus Revision for the Year: 2020-2021

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HIND	I	I	20	NIL	
2			II	20	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	16	NIL	
			IV	16	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			72	NIL	

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TARA GOVT COLLEGE
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SANGAREDDY-502 001

Total Number of Programmes :72

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

Department of Hindi

PRINCIPAL
TARA GOVT COLLEGE
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Total Number of Programmes :72

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Telangana- India

[redacted] HINDI

Syllabus Revision for the Year: 2021-2022

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	22	NIL	
2			II	22	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	20	NIL	
			IV	20	NIL	
4	BA/B.COM/B.SC -HINDI	III	V	16	16	
			VI	16	16	
	Total			116	32	

PRINCIPAL
TARA GOVT COLLEGE
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SANGAREDDY-502 001

Total Number of Programmes : 116

Total Number of Courses : 32

Runnings of Revision :27.5

Note: The content of the syllabus which has been revised is highlighted in the following attachment

Sign of the Head

Department of

PRINCIPAL
GOVT COLLEGE

Total Number of Programmes : 116

Total Number of Courses : 32

Runnings of Revision :27.5

Note: The content of the syllabus which has been revised is highlighted in the following attachment

Sign of the Head

Department of

PRINCIPAL
GOVT COLLEGE

द्वितीय भाषा हिंदी

तृतीय वर्ष, सेमिस्टर V, पाठ्यक्रम

Unit I: हिंदी भाषा के विभिन्न रूप

1. राजभाषा
2. राष्ट्रभाषा
3. संपर्क भाषा
4. प्रयोजनमूलक हिंदी
5. विश्व में हिंदी का महत्व

Unit II: हिंदी साहित्य की विविध विधाओं का परिचय

1. कविता
2. कहानी
3. उपन्यास
4. नाटक
5. एकांकी
6. निबंध
7. आत्मकथा
8. संस्मरण
9. रेखा-चित्र
10. व्यंग्य
11. अन्य विधाएँ

Unit III: जनसंचार के माध्यम

1. जनसंचार का अर्थ, परिभाषाएँ एवं स्वरूप
2. जनसंचार का महत्व
3. जनसंचार की प्रमुख विशेषताएँ
4. जनसंचार के प्रकार
5. दृश्य, श्रव्य, मुद्रण
    - नव इलेक्ट्रॉनिक जनसंचार के माध्यम
    - जनसंचार के माध्यमों में लोककलाएँ

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द्वितीय भाषा हिंदी

तृतीय वर्ष, सेमिस्टर VI, पाठ्यक्रम

Unit I: अनुवाद

1. अनुवाद शब्द की व्युत्पत्ति, अर्थ, परिभाषाएँ एवं स्वरूप
2. अनुवाद का महत्व
3. अनुवाद के प्रकार
4. अनुवादक के गुण

Unit II: पत्रकारिता

1. पत्रकारिता का अर्थ, परिभाषाएँ, स्वरूप तथा उद्देश्य
2. पत्रकारिता का इतिहास
3. पत्रकारिता का महत्व
4. पत्रकारिता के प्रकार
5. पत्रकार के गुण
6. भारत के प्रमुख हिंदी समाचार पत्र

Unit III: हिंदी साहित्य के विविध आयाम

1. हिंदी में स्त्रीवादी साहित्य
2. हिंदी में दलित साहित्य
3. हिंदी में आदिवासी साहित्य
4. हिंदी में अल्पसंख्यक साहित्य

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द्वितीय भाषा हिंदी

तृतीय वर्ष, सेमिस्टर VI, पाठ्यक्रम

Unit I: अनुवाद

1. अनुवाद शब्द की व्युत्पत्ति, अर्थ, परिभाषाएँ एवं स्वरूप
2. अनुवाद का महत्व
3. अनुवाद के प्रकार
4. अनुवादक के गुण

Unit II: पत्रकारिता

1. पत्रकारिता का अर्थ, परिभाषाएँ, स्वरूप तथा उद्देश्य
2. पत्रकारिता का इतिहास
3. पत्रकारिता का महत्व
4. पत्रकारिता के प्रकार
5. पत्रकार के गुण
6. भारत के प्रमुख हिंदी समाचार पत्र

Unit III: हिंदी साहित्य के विविध आयाम

1. हिंदी में स्त्रीवादी साहित्य
2. हिंदी में दलित साहित्य
3. हिंदी में आदिवासी साहित्य
4. हिंदी में अल्पसंख्यक साहित्य

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TARA GOVERNMENT COLLEGE,SANGAREDDY(A)TELANAGANA-I

HINDI

SYLLABUS FOR THE YEAR-2017-2018

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC-HINDI	I	I	11	NIL	
2			II	11	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	14	14	
			IV	14	14	
4	BA/B.COM/B.SC-HINDI	III	-	-	-	
	Total			50	28	

Total Number of Programmes : 50

Total Number of Courses : 28

Percentage of Revision :56.0

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

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Department of Hindi

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)Telangana- I

HINDI

Syllabus Revision for the Year:2018-2019

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	15	NIL	
2			II	15	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	11	NIL	
			IV	11	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			52	NIL	

Total Number of Programmes : 52

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

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Department of Hindi

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)Telangana- I

HINDI

Syllabus Revision for the Year:2018-2019

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	15	NIL	
2			II	15	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	11	NIL	
			IV	11	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			52	NIL	

Total Number of Programmes : 52

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

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SANGAREDDY- 502 001.

Department of Hindi

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)Telangana- India

HINDI

Syllabus Revision for the Year:2019-2020

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	16	16	Chapter-1 Changed
2			II	16	16	Chapter-1 Changed
3	BA/B.COM/B.SC - HINDI	II	I	15	NIL	
			II	15	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			62	32	

Total Number of Programmes : 62

Total Number of Courses : 32

Percentage of Revision :51.6

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

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Department of Hindi

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SANGAREDDY- 502 001.

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)Telangana- India

HINDI

Syllabus Revision for the Year:2019-2020

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	16	16	Chapter-1 Changed
2			II	16	16	Chapter-1 Changed
3	BA/B.COM/B.SC - HINDI	II	I	15	NIL	
			II	15	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			62	32	

Total Number of Programmes : 62

Total Number of Courses : 32

Percentage of Revision :51.6

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

Department of Hindi

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY- 502 001.

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)Telangana- India

HINDI

Syllabus Revision for the Year: 2020-2021

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HIND	I	I	20	NIL	
2			II	20	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	16	NIL	
			IV	16	NIL	
4	BA/B.COM/B.SC - HINDI	III	-	NIL	NIL	
	Total			72	NIL	

Total Number of Programmes :72

Total Number of Courses : NIL

Percentage of Revision : NIL

Note: The content of the syllabus which has been revised is highlighted in the following attachment.

Sign of the Head,

Department of Hindi

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY- 502 001.

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)Telangana- India

HINDI

Syllabus Revision for the Year: 2021-2022

Sl. No.	Programme	Year	Semester	No. of Programmes	Number of Courses having changes	Remarks
1	BA/B.COM/B.SC - HINDI	I	I	22	NIL	
2			II	22	NIL	
3	BA/B.COM/B.SC - HINDI	II	III	20	NIL	
			IV	20	NIL	
4	BA/B.COM/B.SC -HINDI	III	V	16	16	
			VI	16	16	
	Total			116	32	

Total Number of Programmes : 116

Total Number of Courses : 32

Percentage of Revision :27.5

Note: The content of the syllabus which has been revised is highlighted in the following attachmer

Sign of the Head,

Department of Hindi

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TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY- 502 001.

DEPARTMENT OF CHEMISTRY
REVISION OF SYLLABUS

Academic year: 2017-18

S. No.	Subject/ Programme	Year	Semester	Number of courses changed
1	B.Sc.-Chemistry	I	I	Nil
2	B.Sc.-Chemistry	I	II	Nil
3	B.Sc.-Chemistry	II	III	**7**
4	B.Sc.-Chemistry	II	IV	**7**
5	B.Sc.-Chemistry	III	NA	Nil
6	M.Sc.-Organic Chemistry	I	I	Nil
7	M.Sc.-Organic Chemistry	I	II	Nil
8	M.Sc.-Organic Chemistry	II	III	**4**
9	M.Sc.-Organic Chemistry	II	IV	**4**
TOTAL				**22**

Total No. of Courses: **56**
Total No. of Courses having changes: **22**

Percentage of revision: **39.2%**

Academic year: 2018-19

S.No	Subject/ Programme	Year	Semester	Number of courses changed
1	B.Sc.-Chemistry	I	I	Nil
2	B.Sc.-Chemistry	I	II	Nil
3	B.Sc.-Chemistry	II	III	Nil
4	B.Sc.-Chemistry	II	IV	Nil
5	B.Sc.-Chemistry	III	V	**14**
6	B.Sc.-Chemistry	III	VI	**14**
7	M.Sc.-Organic Chemistry	I	I	Nil
8	M.Sc.-Organic Chemistry	I	II	Nil
9	M.Sc.-Organic Chemistry	II	III	Nil
10	M.Sc.-Organic Chemistry	II	IV	Nil
TOTAL				**28**

Total No. of Courses: **76**
Total No. of Courses having changes: **28**
Percentage of revision: **36.8%**

Academic year: 2019-20

S. No.	Subject/ Programme	Year	Semester	Number of courses changed
1	B.Sc.-Chemistry	I	I	**6**
2	B.Sc.-Chemistry	I	II	**6**
3	B.Sc.-Chemistry	II	III	Nil
4	B.Sc.-Chemistry	II	IV	Nil
5	B.Sc.-Chemistry	III	V	Nil
6	B.Sc.-Chemistry	III	VI	Nil
7	M.Sc.-Organic Chemistry	I	I	Nil
8	M.Sc.-Organic Chemistry	I	II	Nil
9	M.Sc.-Organic Chemistry	II	III	Nil
10	M.Sc.-Organic Chemistry	II	IV	Nil
TOTAL				**12**

Total No. of Courses: **74**
Total No. of Courses having changes: **12**
Percentage of revision: **16.2 %**

Academic year: 2020-21

S.No	Subject/ Programme	Year	Semester	Number of courses changed
1	B.Sc.-Chemistry	I	I	Nil
2	B.Sc.-Chemistry	I	II	Nil
3	B.Sc.-Chemistry	II	III	**6**
4	B.Sc.-Chemistry	II	IV	**6**
5	B.Sc.-Chemistry	III	V	Nil
6	B.Sc.-Chemistry	III	VI	Nil
7	M.Sc.-Organic Chemistry	I	I	Nil
8	M.Sc.-Organic Chemistry	I	II	Nil
9	M.Sc.-Organic Chemistry	II	III	Nil
10	M.Sc.-Organic Chemistry	II	IV	Nil
TOTAL				**12**

Total No. of Courses: **84**
Total No. of Courses having changes: **12**
Percentage of revision: **14.2 %**

Academic year: 2021-22

S.No	Subject/ Programme	Year	Semester	Number of courses changed
1	B.Sc.-Chemistry	I	I	Nil
2	B.Sc.-Chemistry	I	II	**9**
3	B.Sc.-Chemistry	II	III	Nil
4	B.Sc.-Chemistry	II	IV	**10**
5	B.Sc.-Chemistry	III	V	**12**
6	B.Sc.-Chemistry	III	VI	**12**
7	M.Sc.-Organic Chemistry	I	I	Nil
8	M.Sc.-Organic Chemistry	I	II	Nil
9	M.Sc.-Organic Chemistry	II	III	Nil
10	M.Sc.-Organic Chemistry	II	IV	Nil
TOTAL				**43**

Total No. of Courses: **78**
Total No. of Courses having changes: **43**
Percentage of revision: **55.1 %**

Telangana State Council of Higher Education, Govt. of Telangana B.Sc., CBCS Common Core Syllabi for all Universities in Telangana

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B.Sc., Chemistry

CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
FIRST YEAR- SEMSTER I				
BS 101	Communication	AECC-1	2	2
BS 102	English	CC-1A	5	5
BS 103	Second language	CC-2A	5	5
BS 104	Optional I	DSC-1A	4T+2P=6	4+1=5
BS 105	Optional II	DSC-2A	4T+2P=6	4+1=5
BS 106	**Optional III- Chemistry - I** **Laboratory Course – I (Qualitative Analysis – I)**	**DSC-3A**	**4T** **= 6** **2P**	**4** **=5** **1**
	Total Credits			**27**
FIRST YEAR- SEMSTER II				
BS 201	Environmental studies	AECC-2	2	2
BS 202	English	CC-1B	5	5
BS 203	Second language	CC-2B	5	5
BS 204	Optional I	DSC-1B	4T+2P=6	4+1=5
BS 205	Optional II	DSC-2B	4T+2P=6	4+1=5
BS 206	**Optional III- Chemistry - II** **Laboratory Course - II (Qualitative Analysis – II)**	**DSC-3B**	**4T** **= 6** **2P**	**4** **=5** **1**
	Total Credits			**27**
SECOND YEAR- SEMSTER III				
BS 301	**Safety Rules in Chemistry Laboratory and Lab Reagents**	**SEC-I**	2	2
BS 302	English	CC-1C	5	5
BS 303	Second language	CC-2C	5	5
BS 304	Optional I	DSC-1C	4T+2P=6	4+1=5
BS 305	Optional II	DSC-2C	4T+2P=6	4+1=5
BS 306	**Optional III- Chemistry - III** **Laboratory Course - III (Quantitative Analysis – I)**	**DSC-3C**	**4T** **= 6** **2P**	**4** **=5** **1**
	Total Credits			**27**
SECOND YEAR- SEMSTER IV				
BS 401	**Remedial Methods for Pollution, Drinking Water and Soil Fertility**	SEC-2	2	2
BS 402	English	CC-1D	5	5
BS 403	Second language	CC-2D	5	5
BS 404	Optional I	DSC-1D	4T+2P=6	4+1=5
BS 405	Optional II	DSC-2D	4T+2P=6	4+1=5
BS 406	**Optional III- Chemistry - IV** **Laboratory Course - IV (Quantitative Analysis – II)**	**DSC-3D**	**4T** **= 6** **2P**	**4** **= 5** **1**
	Total Credits			**27**

*__Optional III Chemistry__ AECC: Ability Enhancement Compulsory Course: SEC: Skill Enhancement Course; DSC: Discipline Specific Course; GE: Generic Elective;

Sc I yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER I
Paper – I
Chemistry - I

Unit-I (Inorganic Chemistry) 15h(1 hr/week)

S1-I-1. s-block elements:

General Characteristics of groups I and II elements, Diagonal relationship between Li and Mg, Be and Al **2 h**

S1-I-2. p-block elements 1: 7 h

Group–13:Synthesis and structure of diborane and higher Boranes (B_4H_{10} and B_5H_9), Boron nitrogen compounds ($B_3N_3H_6$ and BN), Lewis acid nature of BX_3

Group – 14: Carbides-Classification – ionic, covalent, interstitial – synthesis.Structures and reactivity. Industrial application. Silicones – Preapartion – a) direct silicon process b) use of Grignard reagent c) aromatic silylation. Classification – straight chain, cyclic and cross-linked.

Group – 15: Nitrides – Classification – ionic, covalent and interstitial. Reactivity – hydrolysis.Preparation and reactions of hydrazine, hydroxyl amine, phosphazenes.

S1-I-3. General Principles of Inorganic qualitative analysis 6 h

Anion analysis: Theory of sodium carbonate extract, classification and reactions of anions-CO_3^{2-}, Cl^-, Br^-, SO_4^{2-}, PO_4^{3-}, BO_3^{3-},CH_3COO^-, NO_3^-.

Cation Analysis: Principles involved - Solubility product, common ion effect, general discussion for the separation and identification of group I individual cations (Hg_2^{2+}, Ag+, Pb+) with flow chart and chemical equations. Principle involved in separation of group II & IV cations.

General discussion for the separation and identification of group II (Hg^{2+}, Pb^{2+}, Bi^{3+}, Cd^{2+}, Sb^{2+}), III (Al^{3+}, Fe^{3+}), IV ((Mn^{2+}, Zn^{2+}) individual cations with flow chart and chemical equations. Application of concept of hydrolysis in group V cation analysis. General discussion for the separation and identification of group V individual cations (Ba^{2+}, Sr^{2+}, Ca^{2+}) with flow chart and chemical equations. Theory of flame test. Identification of Group VI cations (Mg^{2+}, NH_4^+).

HEAD
DEPARTMENT OF CHEMISTRY
Tara Govt. College, Sangareddy (A)
Dist. Sangareddy - 502 001

Principal(FAC)
PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

Unit - II (Organic Chemistry) 15h(1 hr/week)

S1-O-1:Structural Theory in Organic Chemistry 6 h

***Bond polarization*:** Factors influencing the polarization of covalent bonds, electro negativity – inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance - Mesomeric effect, application to (a) acidity of phenol. (b) acidity of carboxylic acids and basicity of anilines. Stability of carbo cations, carbanions and free radicals. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes.

***Types of organic reactions*:** Addition reactions- electrophilic, nucleophilic and free radical. Substitution reactions – electrophilic, nucleophilic and free radical. Elimination and Rearrangement reactions– Examples.

S1-O-2:Acyclic Hydrocarbons 6 h

Alkanes– Methods of preparation: Corey-House reaction, Wurtz reaction, from Grignard reagent, Kolbe synthesis. Chemical reactivity - inert nature, free radical substitution, Halogenation example- reactivity, selectivity and orientation.

Alkenes - Preparation of alkenes (with mechanism) (a) by dehydration of alcohols (b) dehydrohalogenation of alkyl halides (c) by dehalogenation of 1,2 dihalides, Zaitsev's rule. Properties: Addition of Hydrogen – heat of hydrogenation and stability of alkenes. trans-addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti – Markonikov's addition). Oxidation (cis – additions) – hydroxylation by $KMnO_4$, OsO_4, trans addition- peracids (via epoxidation), hydroboration, ozonolysis – location of double bond. Dienes – Types of dienes, reactions of conjugated dienes – 1,2 and 1,4 addition of HBr to 1,3 – butadiene and Diels – Alder reaction.

Alkynes– Preparation by dehydrohalogenation of vicinal dihalides, dehalogenation of tetrahalides. Physical Properties: Acidity of terminal alkynes (formation of metal acetylides) preparation of higher alkynes, Chemical reactivity – electrophilic addition of X_2, HX, H_2O (tautomerism), Oxidation (formation of enediol, 1,2 diones and carboxylic acids) and reduction (Metal-ammonia reduction, catalytic hydrogenation)

S1-O-3:Alicyclic Hydrocarbons 3 h

Nomenclature, preapartion by Freunds method, Dickmann, heating dicarboxylic metal salts. Properties – reactivity of cyclo propane and cyclo butane by comparing with alkanes. Stability of cycloalkanes – Baeyer strain theory, Sachse and Mohr predictions and Pitzer strain theory. Conformational structures ofcyclopentane, cyclohexane.

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Unit-III (Physical Chemistry) 15 h (1 hr/week)

S1-P-1: Atomic structure and elementary quantum mechanics 6 h

Black body radiation, heat capacities of solids, Rayleigh Jeans law, Planck's radiation law, photoelectric effect,Limitations of classical mechanics, Compton effect, De Broglie's hypothesis. Heisenberg's uncertainty principle, Schrodinger's wave equation and its importance. Physical interpretation of the wave function, significance of ψ and ψ^2, a particle in a box, energy levels, wave functions and probability densities. Schrodinger wave equation for H-atom. Separation of variables, radial and angular functions (only equation), hydrogen like wave functions, quantum numbers and their importance.

S1-P-2:Gaseous State 5 h

Deviation of real gases from ideal behavior. van der Waals equation of state. Critical phenomenon. PV isotherms of real gases, continuity of state. Andrew's isotherms of CO_2. The van der Waal's equation and critical state. Derivation of relationship between critical constants and van der Waal's constants. The law of corresponding states, reduced equation of states. Joule Thomson effect and inversion temperature of a gas. Liquifaction of gases: i) Linde's method based on Joule Thomson effect ii) Claude's method based on adiabatic expansion of a gas.

S1-P-3: Liquid State 4 h

Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only). Liquid crystals, the mesomorphic state: Classification of liquid crystals in to Smectic and Nematic, differences between liquid crystal and solid / liquid. Application of liquid crystals as LCD devices.

Unit – IV (GeneralChemistry) 15 h (1 hr/week)

S1-G-1 Chemical Bonding 11 h

Ionic solids- lattice and solvation energy, solubility of ionic solids, Fajan's rule, polarity and polarizability of ions, covalent nature of ionic bond, covalent bond - Common hybridization and shapes of molecules.

Molecular orbital theory: Shapes and sign convention of atomic orbitals. Modes of overlapping. Concept of σ and π bonds. Criteria for orbital overlap. LCAO concept. Types of molecular orbitals- bonding, antibonding and non bonding. MOED of homonuclear diatomics - H_2, N_2, O_2,O_2^-,O_2^{2-},F_2 (unhybridized diagrams only) and heteronuclear diatomics CO, CN^- NO, NO^+ and HF. Bond order, stability and magnetic properties.

S1-G-2 Evaluation of analytical data 4 h

Significant figures, accuracy and precision. Errors-classification of errors- determinate and indeterminate errors, absolute and relative errors, propagation of errors in mathematical operations – addition, substraction, division and multiplication (with respect to determinate errors).

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References:

Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers 2001. Chem.
4. Vogel's Qualitative Inorganic Analysis by Svehla
5. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn.
6. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
7. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press 1999.
8. Qualitative analysis by Welcher and Hahn.
9. Textbook of Inorganic Chemistry by R Gopalan
10. College Practical chemistry by V K Ahluwalia, Sunitha Dhingra and Adarsh Gulati

Unit- II

1. Text book of organic chemistry by Morrison and Boyd.
2. Text book of organic chemistry by Graham Solomons.
3. Text book of organic chemistry by Bruice Yuranis Powla.
4. Text book of organic chemistry by Soni.
5. General Organic chemistry by Sachin Kumar Ghosh.
6. Text book of organic chemistry by C N pillai

Unit III

1. Principles of physical chemistry by Prutton and Marron.
2. Text Book of Physical Chemistry by Soni and Dharmahara..
3. Text Book of Physical Chemistry by Puri and Sharma.
4. Text Book of Physical Chemistry by K. L. Kapoor.
5. Physical Chemistry through problems by S.K. Dogra.
6. Text Book of Physical Chemistry by R.P. Verma.
7. Elements of Physical Chemistry byLewis Glasstone.

Unit IV

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers 2001. Chem
4. Analytical chemistry by G. L. David Krupadanam, D. Vijaya Prasad, K. Varaprasada Rao, K.L.N. Reddy and C. Sudhakar

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Laboratory Course **45h (3 h / week)**

Paper IQualitative Analysis - I

I. Preparations:

1. e copper (II) sulphate,
2. h alum $KAl(SO_4)_2.\ 12H_2O$,
3. Bis (dimethylglyoximato) nickel(II)

II. Analysis of two anions (one simple and one interfering)

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Sc I yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER II
Paper II
Chemistry - II

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S2-I-1 p-block Elements -II 7 h

Oxides: Types of oxides (a) Normal- acidic, basic amphoteric and neutral (b) Mixed(c) sub oxide d) peroxide e) superoxide. Structure of oxides of C, N, P, S and Cl - reactivity, thermal stability, hydrolysis.

Oxy acids: Structure and acidic nature of oxyacids of B, C, N, P, S and Cl.Redox properties of oxyacids of Nitrogen: HNO_2 (reaction with $FeSO_4$, $KMnO_4$, $K_2Cr_2O_7$), HNO_3 (reaction with H_2S, Cu), HNO_4 (reaction with KBr, Aniline), $H_2N_2O_2$ (reaction with $KMnO_4$). Redox properties of oxyacids of Potasium: H_3PO_2 (reaction with $HgCl_2$), H_3PO_3 (reaction with $AgNO_3$, $CuSO_4$).
Redox properties of oxyacids of Sulphur: H_2SO_3 (reaction with $KMnO_4$, $K_2Cr_2O_7$), H_2SO_4 (reaction with Zn, Fe, Cu), $H_2S_2O_3$ (reaction with Cu, Au), H_2SO_5 (reaction with KI, $FeSO_4$), $H_2S_2O_8$ (reaction with $FeSO_4$, KI)

Interhalogens- classification- general preparation- structures of AB,AB_3, AB_5 and AB_7 type and reactivity. Poly halides- definition and structure of ICl_2^-, ICl_4^- and I_3^- .Comparison of Pseudohalogens with halogens.

S2-I-2 Chemistry of Zero group elements 2 h

General preparation, structure, bonding and reactivity of Xenon compounds – Oxides, Halides and Oxy-halides. Clatherate compounds and Anomalous behavior of He (II)

S2-I-3Chemistry of d-block elements 6 h

Characteristics of d-block elements with special reference to electronic configuration variable valence, ability to form complexes, magnetic properties &catalytic properties. Stability of various oxidation states and SRP Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu traids. Titanium triad – electronic configuration and reactivity of +3 and +4 states – oxides and halides. Chromium triad – reactivity of +3 and +6 states. Copper triad – reactivity of +1, +2 and +3 states.

Unit - II(Organic chemistry) 15 h (1 hr/week)

S2-O-1:Aromatic Hydrocarbons 7h

Concept of aromaticity –definition, Huckel's rule – application to Benzenoids and Non – Benzenoids (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation).

Preapartions: From acetylene, phenols, benzene carboxylic acids and sulphonic acids

Reactions - General mechanism of electrophilic substitution, mechanism of nitration, sulphonation,and halogenation, Friedel Craft's alkylation(polyalkylation) and acylation. Orientation of aromatic substitution - Definition of ortho, para, and meta directing groups. Ring activating and deactivating groups with examples. Orientation – (i) activating groups: Amino, methoxy and alkyl groups. (ii) Deactivating groups - carboxy, nitro, nitrile, carbonyl and sulphonic acid& halo groups.

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S2-O-2:Arenes and Polynuclear Aromatic Hydrocarbons 3 h

Preparation of alkyl benzenes by Friedel Craft's alkylation, Friedel Craft's acylation followed by reduction, Wurtz-Fittig reaction. Chemical reactivity: Ring substitution reactions,side chain substitution reactions and oxidation.

Polynuclear hydrocarbons – Structure of naphthalene and anthracene (Molecular Orbital diagram and resonance energy) Reactivity towards electrophilic substitution. Nitration and sulphonation as examples.

S2-O-3: Halogen compounds 5 hrs

Nomenclature and classification: alkyl (primary, secondary, tertiary), aryl, aralkyl, allyl, vinyl, benzyl. Chemical reactivity - reduction, formation of RMgX, Nucleophilic substitution reactions – classification into S_N^1 and S_N^2. Mechanism and energy profile diagrams of S_N^1 and S_N^2 reactions. Stereochemistry of S_N^2 (Walden Inversion) 2-bromobutane, S_N^1 (Racemisation) 1-bromo-1-phenylpropane explanation of both by taking the example of optically active alkyl halide. Structure and reactivity – Ease hydrolysis - comparison of alkyl, vinyl, allyl, aryl, and benzyl halides.

Unit – III (Physical Chemistry) 15 h (1 hr/week)

S2-P-1:Solutions 5 h

Liquid - liquid mixtures, ideal liquid mixtures**,** Raoult's and Henry's laws. Non ideal systems. Azeotropes HCl-H_2O and C_2H_5OH - H_2O systems. Fractional distillation,. Partially miscible liquids- Phenol – Water, Trimethyl amine – Water and Nicotine – Water systems. Lower upper consolute temperatures. Effect of impurity on consolute temperature.Immiscible liquids andsteam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law with solvent extraction.

S2-P-2: Dilute Solutions & Colligative Properties 5 h

Dilute Solutions, Colligative Properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis - laws of osmotic pressure, its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, Van't hoff factor, degree of dissociation and assocoation of solutes.

S2-P-3: Solid state Chemistry 5 h

Laws of Crystallography – (i) Law of Constancy of interfacial angles (ii) Law of Symmetry, Symmetry elements in crystals (iii) Law of rationality of indices. Definition of space lattice, unit cell. Bravais Lattices and Seven Crystal systems (a brief review). X-ray diffraction by crystals; Derivation of Bragg's equation, Determination of structure of NaCl, KCl & CsCl (Bragg's method and Powder method).

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Unit – IV (General Chemistry) 15 h (1 hr/week)

S2-G-1: Theory of Quantitative Analysis **5 hours**

Volumetric Analysis: Introduction, standard solutions, indicators, end point, titration curves, Types of titrations: i)neutralization titration- principle, theory of acid base indicators, titration curves and selection of indicators- strong acid - strong base, strong acid –weak base, weak acid- strong base and weak acid –weak base.

Gravimetric analysis- Introduction, nucleation, precipitation, growth of precipitate, filtration and washing, drying and incineration of precipitate, coprecipitation and post precipitation. Determination of Ni^{2+}

S3-G-2: Theories of bonding in metals: **5 h**

Valence bond theory, Explanation of metallic properties and its limitations, Free electron theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors n-type and p-type, extrinsic & intrinsic semiconductors, and insulators.

S2-G-3: Material Science **5 h**

Classification of materials- classification as metals, ceramics, organic polymers, composites, biological materials etc. The property of super conductivity of materials.

Super conducting materials- elements, alloys and compounds. Properties of super conductors- zero resistivity, Meisener effect and thermal properties. Composites-meaning of composites, advanced composites, classification –particle rein forced fiber reinforced and structural composites general characters of composite materials-Particle-reinforced composites – large particle and dispersion- strengthened composite. Fiber reinforced composites (continuous and discontinuous fiber composites).

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3. Text Book of Physical Chemistry by Puri and Sharma
4. Text Book of Physical Chemistry by K. L. Kapoor
5. Physical Chemistry through problems by S.K. Dogra.
6. Elements of Physical Chemistry by Lewis and Glasstone.
7. Material science by Kakani & Kakani

Unit IV

1. Vogel's Text Book of Quantitative Analysis by G.H.Jeffery, J.Bassett, J.Mendham and R.C. Denney 5th edn Addison Wesley Longman Inc. 1999.
2. Quantitative Analysis by Day and Underwood Prentice Hall (India) VI Edn..
3. Nano: The Essentials by T. Pradeep, McGraw-Hill Education.
4. Chemistry of nanomaterials: Synthesis, Properties and applications by CNR Rao et.al.
5. Nanostructured Materials and Nanotechnology, edited by Hari Singh Nalwa, Academic Press
6. College Practical chemistry by V K Ahluwalia, Sunitha Dhingra and Adarsh Gulati

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Laboratory Course **5hrs (3 h / week)**

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Paper II - Qualitative Analysis - II

I Semi micro analysis of mixtures

Analysis of two anions and two cations in the given mixture.

Anions: CO_3^{2-}, SO_3^{2-}, $.S^{2-}$ Cl^-, Br^-, I^- CH_3COO^-, NO_3^- PO_4^{3-}, BO_3^{3-}, SO_4^{2-}

Cations: Ag^+ , Pb^{2+}, Hg^+, Hg^{2+}
Pb^{2+}, Bi^{3+} , Cd^{2+}, Cu^{2+}, $As^{3+/5+}$, $Sb^{3+/5+}$, $Sn^{2+/4+}$
Al^{3+}, Cr^{3+}, Fe^{3+}
Zn^{2+}, Ni^{2+}, Co^{2+}, Mn^{2+}
Ca^{2+}, Sr^{2+}, Ba^{2+}
Mg^{2+}, NH_4

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DEPARTMENT OF CHEMISTRY
OSMANIA UNIVERSITY
(Effective from academic year 2016-2017 for Campus and Constituent colleges
[UNDER CBCS Scheme]

Semester I

	Hrs. /week	internal assessment	Semester exam	Total	Credits
CH101T (*)	4	20 marks	80 marks	100 marks	4
CH102T (*)	4	20 marks	80 marks	100 marks	4
CH103T (*)	4	20 marks	80 marks	100 marks	4
CH104T (*)	4	20 marks	80 marks	100 marks	4
CH151P (IC LAB*)	6			75 marks	3
CH152P (OC LAB*)	(4h + 2T)			50 marks	2
CH153P (PC LAB*)	6			75 marks	3
Total				**600 marks**	**24**

(*Core= compulsory papers common to all students admitted to M.Sc Chemistry, OU)

Semester II

	Hrs. /week	internal assessment	Semester exam	Total	Credits
CH201T (*)	4	20 marks	80 marks	100 marks	4
CH202T (*)	4	20 marks	80 marks	100 marks	4
CH203T (*)	4	20 marks	80 marks	100 marks	4
CH204T (*)	4	20 marks	80 marks	100 marks	4
CH251P (IC LAB*)	6			75 marks	3
CH252P (OC LAB*)	6			75 marks	3
CH253P (PC LAB*)	(4h + 2T)			50 marks	2
Total				**600 marks**	**24**

(*= compulsory papers common to all students admitted to M.Sc Chemistry, OU)

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M.Sc CHEMISTRY SYLLABUS

(Effective from academic year 2016-2017 for Campus and Constituent colleges.

SEMESTER –I

Semester-I and Semester-II syllabus is common for all specializations i.e., Inorganic-Analytical, Organic, Physical, Physical- Organic and Chemistry (Pharmacoinformatics).

Paper 1 CH 101 (INORGANIC CHEMISTRY)

IC 01: Symmetry of molecules
IC 02: Bonding in Metal Complexes - I
IC 03: Coordination equilibria
IC 04: Ligational aspects of diatomic molecules

Teaching hours-4/week Marks-80

IC-01: Symmetry of Molecules: 15 hrs

Concept of Symmetry in Chemistry – Symmetry Operations – Symmetry Elements: Rotational Axis of Symmetry and Types of Rotational Axes, Plane of Symmetry and types of Planes, Improper Rotational Axis of Symmetry , Inversion Center and Identity Element – More about Symmetry Elements – Molecular Point Groups: Definition and Notation of Point Groups, Classification Molecules in to C_1, C_s, C_i, C_n,C_{nv}, C_{nh}, $C_{\infty v}$, D_n, D_{nh}, D_{nd}, $D_{\infty h}$, S_n (n=even), T_d, O_h, I_h, K_h Groups. Descent in Symmetry with Substitution – Exercises in Molecular Point Groups – Symmetry and Dipole moment – Symmetry criteria for Optical activity.

IC – 02: Bonding in metal complexes – I: 15 hrs

Crystal Field Theory: Salient features of CFT. d-orbital splitting patterns in regular Octahedral, tetragonally distorted octahedral, Jahn-Tellar theorem , trigonal bipyramidal, trigonal planar, Pentagonal bipyramidal, and linear geometries. Concept of weak field and strong fields. - Calculation of crystal field stabilization energies (CFSE's) in six and four coordinate complexes.

Types of magnetic behaviour – magnetic susceptibility – calculation of magnetic moment from magnetic susceptibility spin only formula ,- Quenching of orbital angular momentum – Determination of magnetic moment from Guoy's method.. Applications of magnetic moment data for the determination of oxidation states, bond type and stereochemistry. Spin crossover: High spin, low spin cross over phenomenon in $[Fe(Ophen)_2(NCS)_2]$ and $[Fe(R_2NCS_2)_3]$. Spinels.

IC-03: Coordination Equilibria: 15 hrs

Solvation of metal ions- Metal complex formation in solution-Binary metal complexes. Stability constants (types and relationships between them). – Factors influencing the stability constants: (i) Metal ion effects (charge/size, IP, crystal field effect, John-Teller effect, Pearson theory of hard and soft acids and bases (HSAB), elecronegativity and hardness and softness, symbiosis. (ii) Ligand effects (Basicity , Substituent effect , Steric , Chelate(size and number of chelate rings), Macrocyclic and Cryptate effects- crown ethers , crypton, size match selectivity or concept of hole size, limitations, Macrocycles with pendent groups– Methods used for the determination of Stability constants (Basic Principles only): pH metric, Spectrophotometric and Polarographic methods.

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Ternary Metal Complexes – definition – Formation of ternary metal complexes – Step-wise and simultaneous equilibria with simple examples.

IC – 04: Ligational Aspects of Diatomic molecules 15 hrs

Metal Carbonyls:- Carbon monoxide as a ligand – Molecular orbitals of CO - Donor and Acceptor molecular orbitals of CO; Bonding modes of CO- Terminal and Bridging; Evidence for multiple bonding from Bond lengths and Stretching frequencies; 18 Valence electron rule and its application.

Metal Nitrosyls: - NO as a ligand – Molecular orbitals of NO – Donor and Acceptor components; Bonding modes of NO – Terminal (Linear, Bent) and Bridging; Structural aspects of $[IrCl(PPh_3)_2(CO)(NO)]^+$ and $[RuCl(PPh_3)_2(NO)_2]^+$.

Stereo chemical control of valence in $[Co(diars)_2(NO)]^{2+}$ and $[Co(diars)_2(NO)(SCN)]^+$.

Metal Dinitrogen complexes: - N_2 as aligand – Molecular orbitals of N_2; Bonding modes – Terminal and Bridging; Stretching frequencies; Structures of Ru (II) and Os(II) dinitrogen complexes; Chemical fixation of dinitrogen.

Suggested References:

1. Symmetry and Group theory in Chemistry, Mark Ladd, Marwood Publishers, London (2000).
2. Molecular Symmetry and Group Theory, Robert L.Carter, John Wiley & Son (1998).
3. Symmetry and Spectroscopy of Molecules. K.Veera Reddy, New Age International (P) Limited (1999).
4. Advanced Inorganic Chemistry. F.A.Cotton, G.Wilkinson, C.A.Murillo and M.Bochmann, 6th Edition, Wiley Interscience, N.Y (1999
5. Inorganic Chemistry, J.E. Huheey, K.A.Keiter and R.L.Keiter 4 th Edition Harper Cottens College Publications (1993).
6. Homogeneous Catalysis by Metal complexes Vol I, M M Taqui Khan and A E Martell, Academic Press NY (1974).
7. Inorganic Chemistry, Keith F.Purcell and John C.Kotz, Holt-Saunders International Editions, London (1977).

Paper-II: CH 102 T (Organic Chemistry)

OC-01: Stereochemistry
OC-02: Reaction mechanism-1
OC-03: Conformational analysis (Acyclic systems)
OC-04: Heterocyclic compounds & Natural products

OC-01: Stereochemistry 15 hrs

Molecular representations: Wedge, Fischer, Newman and Saw-horse formulae, their description and interconversions.

Molecular Symmetry & Chirality: Symmetry operations and symmetry elements (Cn & Sn). Criteria for Chirality. Desymmetrization.

Axial, planar and helical chirality: Axially chiral allenes,spiranes,alkylidene cycloalkanes, chiral biaryls, atropisomerism, planar chiral ansa compounds and trans- cyclooctene, helically chiral compounds and their configurational nomenclature

Relative and absolute configuration: Determination of configuration by chemical correlation methods.

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Racemisation and resolution techniques: Racemisation, resolutions by direct crystallization, diastereoisomer salt formation chiral chromatography and asymmetric transformation.

Determination of configuration in E, Z-isomers: Spectral and Chemical methods of configuration determination of E,Z isomers. Determination of configuration in aldoximes and ketoximes.

OC-02: Reaction mechanism-I **15 hrs**

Electrophilic addition to carbon carbon double bond: Stereoselective addition to carbon carbon double bond; *anti* addition- Bromination and epoxidation followed by ring opening. *Syn* addition of OsO_4 and $KMnO_4$.

Elimination reactions Elimination reactions E2, E1, E1CB mechanisms. Orientation and stereoselectivity in E2 eliminations. Pyrolytic *syn* elimination and α-elimination, elimination Vs substitution.

Determination of reaction mechanism: Determination of reaction mechanism: Energy profiles of addition and elimination reactions, transition states, product isolation and structure of intermediates, use of isotopes, chemical trapping and crossover experiments. Use of IR and NMR in the investigation of reaction mechanism.

OC-03: Conformational analysis (acyclic systems) **15 hrs**

Conformational isomerism: Introduction to the concept of dynamic stereochemistry. Conformational diastereoisomers and conformational enantiomers .Study of conformations in ethane and 1,2-disubstituted ethane derivatives like butane, dihalobutanes, halohydrin, ethylene glycol, butane-2, 3-diol amino alcohols and 1,1,2,2-tetrahalobutanes. Klyne-Prelog terminology for conformers and torsion angles

Conformations of unsaturated acyclic compounds: Propylene, 1-Butene, Acetaldehyde Propionaldehyde and Butanone.

Factors affecting the conformational stability and conformational equilibrium: Attractive and repulsive interactions. Use of Physical and Spectral methods in conformational analysis.

Conformational affects on the stability and reactivity of acyclic diastereoisomers: Steric and stereoelectronic factors-examples.Conformation and reactivity. The Winstein-Holness equation and the Curtin – Hammett principle

OC-4: Heterocyclic compounds &Natural products **15 hrs**

Heterocyclic compounds: Introduction, Nomenclature Synthesis and reactivity of indole, quinoline, isoquinoline, carbazole and acridine

Natural products : Importance of natural products as drugs.

Terpenoids : General methods in the structure determination of terpenes. Isoprene rule. Structure determination and synthesis of β-carotene, α-terpeniol and camphor.

Alkaloids: General methods of structure determination of alkaloids. Structure determination and synthesis of papaverine

References:

1.Stereochemistry of carbon compounds by Ernest L.Eliel and Samuel H. Wilen
2. Stereochemistry of organic compounds- Principles and Applications by D. Nasipuri
3.Heterocyclic Chemistry, T.L. Gilchrist, Longman UK Ltd, London (1985).
4.Benzofurans A. Mustafa, Wiley-Interscience, New York (1974).

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5.Heterocyclic Chemistry, 3rd Edn J.A.Joule, K.Mills and G..F.Smith, Stanley Thornes Ltd,UK, (1998)
6.The Chemistry of Indole, R.J. Sunderberg, Academic Press, New York (1970).
7.An introduction to the chemistry of heterocyclic compounds, 2nd Edn.R.M.Acheson, Interscience Publishers, New York, 1967.
8.Advanced Organic Chemistry by Jerry March
9.Mechanism and Structure in Organic Chemistry S. Mukerjee

Paper CH 103 (PHYSICAL CHEMISTRY)

PC-01: Thermodynamics-I
PC-02: Electrochemistry-I
PC-03: Quantum Chemistry-I
PC-04: Chemical Kinetics-I

PC-01: Thermodynamics-I 15 hrs

Concept of Entropy, Entropy as a function of V and T, Entropy as a function of P and T. Entropy change in isolated systems- Clausius inequality. Entropy change as criterion for spontaneity and equilibrium.

Third law of thermodynamics. Evaluation of absolute entropies from heat capacity data for solids, liquids and gases. Standard entropies and entropy changes of chemical reactions.

Thermodynamic relations. Gibbs equations. Maxwell relations.

Gibbs equations for non-equilibrium systems. Material equilibrium. Phase equilibium. Clausius-Clapeyron equation .Conditions for equilibrium in a closed system.

Chemical potential of ideal gases. Ideal-gas reaction equlibrium-derivation of equilibrium constant. Temperature dependence of equilibrium constant-the van't Hoff equation.

Solutions: Specifiying the Solution composition. Partial molar poperties-significance. Relation between solution volume and partial molar volume. Measurement of partial molar volumes- slope and intercept methods. The chemical potential. Variation of chemical potential with T and P. Gibbs-Duhem equation-derivation and significance.

PC-02: Electrochemistry- I **15 hrs**

Electrochemical Cells: Derivation of Nernst equation – problems. Chemical and concentration cells (with and without transference). Liquid junction potential (LJP) – derivation of the expression for LJP – its determination and elimination**.** Types of electrodes. Applications of EMF measurements: Solubility product, potentiometric titrations, determination of pH using glass electrode, equilibrium constant measurements.

Decomposition potential and its significance. Electrode polarization – its causes and elimination. Concentration over-potential.

Concept of activity and activity coefficients in electrolytic solutions. The mean ionic activity coefficient. Debye-Huckel theory of electrolytic solutions. Debye-Huckel limiting law (derivation not required). Calculation of mean ionic activity coefficient. Limitations of Debye-Huckel theory. Extended Debye-Huckel law.

Theory of electrolytic conductance. Derivation of Debye-Huckel-Onsager equation – its validity and limitations.

Concept of ion association – Bjerrum theory of ion association (elementary treatment)-ion association constant – Debye-Huckel-Bjerrum equation.

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PC-03: Quantum Chemistry- I 15 hrs

A brief review of Black body radiation-Planck's concept of quantization-Planck's equation, average energy of an oscillator (derivation not required), Wave particle duality and uncertain principle-significance of these for microscopic entities. Emergence of quantum mechanics. Wave mechanics and Schrödinger wave equation.

Operators- Operator algebra. Commutation of operators, linear operators. Complex functions. Hermitian operators. Operators ∇ and ∇^2 .Eigenfunctions and eigenvalues. Degeneracy. Linear combination of eigenfunctions of an operator. Well behaved functions. Normalized and orthogonal functions.

Postulates of quantum mechanics: Physical interpretation of wave function. Observables and Operators. Measurability of operators. Average values of observables. The time dependent Schrodinger equation. Separation of variables and the time-independent Schrodinger equation. Theorems of quantum mechanics. Real nature of the eigen values of a Hermitian operator-significance. Orthogonal nature of the eigen values of a Hermitian operator-significance of orthogonality. Expansion of a function in terms of eigenvalues. Eigen functions of commuting operators-significance. Simultaneous measurement of properties and the uncertainty principle. Particle in a box- one dimensional and three dimensional. Plots of ψ and ψ^2-discussion. Degeneracy of energy levels. Calculations using wave functions of the particle in a box-orthoganality, measurability of energy, position and momentum, average values and probabilities. Application to the spectra of conjugated molecules.

PC-04: Chemical Kinetics- I

Theories of reaction rates: Collision theory, steric factor. Transition state theory. Thermodynamic formulation of transition state theory. Potential energy surface diagram, Reaction coordinate, Activated complex. Activation parameters and their significance. The Eyring equation. Unimolecular reactions and Lindamann's theory.

Complex reactions- Opposing reactions, parallel reactions and consecutive reactions (all first order type). Chain reactions-general characteristics, steady state treatment. Example- H_2-Br_2 reaction. Derivation of rate law.

Effect of structure on reactivity- Linear free energy relationships. Hammett and Taft equations-substituent (σ and σ^*) and reaction constant (ρ and ρ^*) with examples. Deviations from Hammett correlations, reasons- Change of mechanism, resonance interaction. Taft four parameter equation. Correlations for nucleophillic reactions. The Swain – Scott equation and the Edward equation. Reactions in solutions: Primary and secondary salt effects.

The reactivity-selectivity principle – Isokinetic temperature -Isoselectivty rule, Intrinsic barrier and Hammond's postulate.

References:

1. Atkin's Physical Chemistry, Peter Atkins and Julio de Paula, Oxford University press
2. Physical Chemistry, Ira N. Levine, McGraw Hill
3. Physical Chemistry-A Molecular approach, D.A. McQuarrie and J.D. Simon, Viva Books Pvt. Ltd
4. Molecular Thermodynamics, D.A. McQuarrie and J.D. Simon, University Science Books
5. Quantum Chemistry, Ira N. Levine, Prentice Hall
6. Introduction to Quantum Chemistry, A.K. Chandra, Tata McGraw Hill
7. Chemical Kinetics, K.J. Laidler, McGraw Hill

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8. Kinetics and Mechanism of Chemical Transformations, J. Rajaraman and J. Kuriacose, McMillan
9. Introduction to Electrochemistry, S. Glasstone
10. Modern Electrochemistry, J. O. M. Bockris & A. K. N. Reddy, Plenum
11. Principles of physical chemistry, Samuel H. Maron and Carl F. Prutton, Oxford& IBH
12. The Physical Basis of Organic Chemistry by Howard Maskill, Oxford University Press (New York)
13. Chemical Kinetics and Reaction Mechanisms, J. H. Espenson, McGraw Hill
14. Physical Organic Chemistry, N. S. Isaacs, ELBS
15. Elementary Quantum Chemistry, F. L. Pilar, McGraw Hill.
16. Quantum Chemistry – D.A. Mcquarri Viva Publications

Paper-IV: CH 104 (ANALYTICAL TECHNIQUES and SPECTROSCOPY- I)

ASP 01: Techniques of Chromatography
ASP 02: NMR spectroscopy-I (^{1}H NMR)
ASP 03: Rotational and Vibrational spectroscopy
ASP 04: Electronic spectroscopy

ASP-01: Techniques of Chromatography 15 hrs

i. Introduction, Classification of chromatographic techniques, differential migration rates, partition ratio, retention time, relation between partition ratio and retention time, capacity factor, selectivity factor. Efficiency of separation- resolution, diffusion, plate theory and rate theory.

ii. **GC:** Principle, instrumentation, detectors- TCD, FID, ECD. Derivatisation techniques, PTGC.

iii. **HPLC:** Principle, instrumentation, detectors- UV detectors, Photodiode array detector, fluorescence detector.

iv. Applications: Methods of quantitation for GC and HPLC: GC analysis of hydrocarbons in a mixture, GC assay of methyl testosterone in tablets, atropine in eye drops. HPLC assy of paracetamol and asprin in tablets.

ASP 02: NMR spectroscopy-I (^{1}H NMR) 15 hrs

^{1}H NMR spectroscopy: Magnetic properties of nuclei, Principles of NMR Instrumentation, CW and pulsed FT instrumentation, equivalent and non equivalent protons, enantiotopic and diastereotopic protons, Chemical shifts, factors affecting the chemical shifts, electronegativity and anisotropy, shielding and deshielding effects, Signal integration, Spin-spin coupling: vicinal, germinal and long range, Coupling constants and factors affecting coupling constants.

Applications of ^{1}H NMR spectroscopy: Reaction mechanisms (cyclic bromonium ion, electrophilic and nucleophilic substitutions, carbocations and carbanions), E, Z isomers, conformation of cyclohexane and decalins, keto-enol tautomerism, hydrogen bonding, proton exchange processes (alcohols, amines and carboxylic acids), C-N rotation. Magnetic resonance imaging (MRI). ^{1}H NMR of organic molecules and metal complexes: ethyl acetate, 2- butanone, mesitylene, paracetamol, asprin, ethylbenzoate, benzyl acetate, 2-chloro propionic acid, $[HNi(OPEt_3)_4]^+$, $[HRh(CN)_5]$ (Rh I=1/2), $[Pt(acac)_2]$.

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ASP 03: Rotational, Vibrational and Raman spectroscopy 15 hrs

a). Microwave Spectroscopy: Classification of molecules based on moment of inertia. Diatomic molecule as rigid rotator and its rotational energy levels. Selection rules (derivation not required). Calculation of bond lengths from rotational spectra of diatomic molecules. Isotope effect on rotational spectra. Calculation of atomic mass from rotational spectra. Brief description of microwave spectrometer.

b). Vibrational Spectroscopy. Vibrational energy levels of diatomic molecules, selection rules (derivation not required). Calculation force constant from vibrational frequency. Anharmonic nature of vibrations. Fundamental bands, overtones and hot bands, Fermi Resonance. Vibrationrotation spectra diatomic molecules. Vibrations of poly atomic molecules. Normal modes of vibration, concept of group frequencies. Characteristics of vibrational frequencies of functional groups; Stereochemical effects on the absorption pattern in carbonyl group, cis-trans isomerism and hydrogen bonding. Isotopic effect on group frequency. IR spectra of metal coordinated NO_3^-, SO_4^{2-} and CO_3^{2-} ions.

c) Raman Spectroscopy- Classical and Quantum theories of Raman effect. Rotational Raman and Vibrational Raman spectra, Stokes and anti- Stokes lines. Complementary nature of IR and Raman spectra.

ASP 04:Electronic spectroscopy 15 hrs

Electronic spectroscopy: Electronic spectra: Elementary energy levels of molecules-selection rules for electronic spectra; types of electronic transitions in molecules. Chromophores: Congugated dienes, trienes and polyenes, unsaturated carbonyl compounds, Benzene, mono substituted derivative (Ph-R), di substituted derivative (R-C_6H_4-R′) and substituted benzene derivatives (R-C_6H_4-COR′), Woodward-Fieser rules. Polynuclear aromatic compounds (Biphenyl, stilbene, naphthalene, anthracene, phenanthrene and pyrene). Heterocyclic systems. Absorption spectra of charge transfer complexes. Solvent and structural influences on absorption maxima, stereochemical factors. Cis-trans isomers, and cross conjugation. Beer's law application to mixture analysis and dissociation constant of a weak acid.

References:

1. Fundamentals of Molecular Spectroscopy, Banwell and McCash.
2. Introduction to Molecular Spectroscopy, G.M. Barrow.
3. Absorption Spectroscopy of Organic Compounds, J.R. Dyer.
4. Biochemistry: Hames and Hooper.
5. Introduction to Spectroscopy, Pavia Lampman Kriz.
6. Pharmaceutical analysis, Watson
7. NMR in Chemistry- A multinuclear introduction, William Kemp.
8. Organic Spectroscopy, William Kemp.
9. Spectroscopy of organic compounds, P.S. Kalsi.
10. Structural methods n Inorganic chemistry, E.A.V Ebsworth.
11. Organic Spectroscopy, LDS Yadav
12. Organic Spectroscopy, Y.R. Sharma
13. Molecular Spectroscopy – Arhuldas
14. Vibrational spectroscopy – D.N. Satyanarayana

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Practicals:

Paper CH 151: Inorganic chemistry practicals: 6 hrs/week

I. Calibrations:

(i) Calibration of weights.
(ii) Calibration of pipettes.
(iii) Calibration of standard flasks.
(iv) Calibration of burette.

II. EDTA back-titrations:

(i) Estimation of Ni^{2+}.
(ii) Estimation of Al^{3+}.

III. EDTA substitution titrations:

Estimation of Ca^{2+}.

IV. Redox Titrations

(i) Estimation of Ferrocyanide and Ferricyanide in a mixture

V. Preparation of complexes:

(i). Hexaammine nickel (II) chloride.
(ii). Tris (acetylacetanato) manganese.
(iii). Tris (ethylenediamine) nickel (II) thiosulphate.
(iv). Mercury tetrathiocyanato cobaltate (II).
(v). Chloro pentaammine cobalt (III) chloride
(vi). Tetrammine copper (II) sulphate and estimation of NH_3 and calculation of % purity.
(vii) One component gravimetric estimations
  (i) Estimation of Zn^{2+}
  (ii) Estimation of Ba^{2+}

Paper CH 152 Organic Chemistry Lab course 6 hours/ week

Synthesis of the following compounds: p-Bromoacetanilide, p- Bromoaniline, 2,4,6-tribromoaniline, 1,3,5-tribromobenzene, aspirin, tetrahydrocarbazole, 7-hydroxy-4-methyl coumarin, m-dinitrobenzene, m-nitroaniline, hippuric acid, azlactone,anthracene-maleic anhydride adduct, Phthalimide, 2,4-dihydroxyacetophenone

References.

1. Text book of practical organic chemistry, Vogel
2. Text book of practical organic chemistry, Mann and Saunders.

Paper 153 Physical Chemistry Lab course: 6 hrs / week

Physical properties:

Data analysis I: Significant figures, Precision and accuracy

Distribution:

- Distribution of acetic acid between n-butanol and water
- Distribution of iodine between hexanes and water

Chemical kinetics:

- Acid-catalyzed hydrolysis of methyl acetate
- Peroxydisulphate - reaction (overall order)
- Oxidation of iodide ion by hydrogen peroxide- iodine clock reaction

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Conductometry:

- Titration of strong acid vs strong base
- Titration of weak acid vs strong base
- Determination of cell constant
- Determination of dissociation constant of a weak acid

Potentiometry:

- Titration of strong acid vs strong base
- Titration of weak acid vs strong base
- Determination of dissociation constant of a weak acid
- Determination of single electrode potential

Polarimetry:

- Determination of specific rotation of sucrose
- Acid-catalyzed hydrolysis of sucrose (inversion of sucrose)

Adsorption and others:

- Adsorption of acetic acid on animal charcoal or silica gel
- Determination of critical solution temperature of phenol-water system
- Effect of added electrolyte on the CST of phenol-water system

Determination of **molecular weight o f a polymer by viscometry**.

References:

1. Senior Practical Physical Chemistry: B.D. Khosla, V.C. Garg and A. Khosla
2. Experimental Physical Chemistry: V. Athawale and P. Mathur.
3. Practical Physical Chemistry: B. Vishwanathan and P.S. Raghavan.
4. Practical in Physical Chemistry: P.S. Sindhu
5. Advanced Practical Physical chemistr: J.B.Yadav
6. Vogel Text book of Quantitative Analysis, 6th edition, Pearson education Ltd. 2002.

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SEMESTER –II

(Semester-I and Semester-II syllabus is common for all specializations i.e., Inorganic-Analytical, Organic, Physical, Chemistry (Pharmacoinformatics) and Physical- Organic.)

Paper CH 201 INORGANIC CHEMISTRY

IC 05: Reaction mechanisms of transition metalcomplexes
IC 06: Bonding in metal complexes-II
IC 07: Metal clusters
IC 08: Biocoordination chemistry

Teaching hours/week-4 Marks-80

IC-05: Reaction mechanisms of transition metal complexes: 15 hrs

Ligand substitution reactions:

Energy profile of a reaction – Transition state or Activated Complex. Types of substitution reactions (SE, SN, SN^1, SN^2). Langford and Grey classification – A mechanism, D-Mechanism, I_a, I_d, and Intimate mechanism.

Ligand substitution reactions in octahedral complexes:

Aquation or Acid hydrolysis reactions, Factors effecting Acid Hydrolysis , Base Hydrolysis, Conjugate Base Mechanism, Evidences in favour of SN^1CB Mechanism.

Substitution reactions with out Breaking Metal-Ligand bond. Anation reaction

Ligand Substitution reactions in Square-Planar complexes: Mechanism of Substitution in Square-Planar complexes- Trans-effect, Trans-influence, Grienberg's Polarization theory and Π - bonding theory – Applications of Trans-effect in synthesis of Pt (II) complexes.

Electron Transfer Reactions (or Oxidation-Reduction Reactions) in Coordination compounds: Mechanism of One-electron Transfer Reactions: Atom (or group) Transfer or Inner Sphere Mechanism, Direct electron Transfer or Outer Sphere Mechanism. Factrors affecting direct electron transfer reactions, Cross reactions and Marcus-Hush theory.

IC-06: Bonding in Metal Complexes – II: 15 hrs

Free ion terms and Energy levels: Configurations, Terms, States and Microstates – Formula for the calculation of Microstates p^n and d^n configurations – L-S (Russel-Saunders) coupling scheme – j-j coupling scheme – Determination of terms for various p^n and d^n configurations of metal ions. Hole formalism – Energy ordering of terms (Hund's rules) Inter – electron repulsion Parameters (Racah parameters) – Spin-Orbital coupling parameters. Effect of weak cubic crystal fields on S,P,D and F terms- Orgel Diagrams.

IC-07: Metal Clusters: 15 hrs

Carbonyl clusters: Factors favouring Metal-Metal bonding – Classification of Clusters – Low Nuclearity Clusters : M_3 and M_4 clusters , structural patterns in $M_3(CO)_{12}$ (M=Fe,Ru,Os) and $M_4(CO)_{12}$ (M=Co,Rh,Ir) Clusters. Metal carbonyl scrambling – High Nuclearity clusters M_5, M_6, M_7, M_8 and M_{10} Clusters-, Polyhedral skeletal electron pair theory and Total Electron Count theory – Capping rule – Structural patterns in $[Os_6(CO)_{18}]^{2-}$, $[Rh_6(CO)_{16}]$, $\{Os_7(CO)_{21}]$, $\{Rh_7(CO)_{16}]^{3-}$, $[Os_8(CO)_{22}]^{2-}$, $[Os_{10}C(CO)_{24}]^{2-}$ and $[Ni_5(CO)_{12}]^{2-}$.

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Metal Halide clusters: Major structural types in Dinuclear Metal-Metal systems – Edge sharing Bioctahedra, Face sharing Bioctahedra, Tetragonal prismatic and Trigonal antiprismatic structures -. Structure and bonding in $[Re_2Cl_8]^{2-}$ and Octahedral halides of $[Mo_6(Cl)_8]^{4+}$ and $[Nb_6(Cl)_{12}]^{2+}$. Trinuclear halides of Re(III). Hoffman's Isolobal analogy and its Structural implications. Boranes, carboranes, STYX Rule. Stereo chemical non-rigidity in $[Rh_4(CO)_{12}]$ and $[Fe_2(Cp)_2(CO)_4]$.

IC-08: Bio coordination chemistry: 15 hrs

Metal ions in Biological systems: Brief survey of metal ions in biological systems. Effect of metal ion concentration and its physiological effects. Basic principles in the biological selection of elements.

Oxygen transport and storage: Hemoglobin (Hb) and Myoglobin (Mb) primary, secondary, tertiary and quarternary structures and non-covalent bonds present in them. Oxygenation equilibria for Mb and Hb. Factor effecting oxygenation equilibria. Cooperativity and its mechanism. Spin state of iron. Spatial and electronic aspects of dioxygen binding. Allosteric models (T and R states). Role of globin. Transport of NO and CO_2. Hemocynin (Hc) and Hemerythrin (Hr): Introduction-structure of active sites with oxygen and without oxygen. Comparison of Hemerythrin and Hemocyanin with hemoglobin.

Photosynthesis: Structural aspects of Chlorophyll. Photo system I and Photo system II.

Vitamin B_6 model systems: Forms of vitamin B_6 with structures. Reaction mechanisms of (1) Transamination (2) Decarboxylation and (3) Dealdolation in presence of metal ions.

References:

1. Inorganic Reaction Mechanisms. M.L.Tobe and John Burgess, Addison Wesley Longman (1999).
2. Metal ions in Reaction Mechanisms. K.Veera Reddy. Golgotia Publications (P) Ltd
3. Mechanisms of Reactions in Transition Metal Sites. Richard A Henderson, Oxford Science Publications, London (1993).
4. Inorganic Reaction Mechanisms, F.Basolo and R.G.Pearson, New York (1967).
5. Advanced Inorganic Chemistry. F.A.Cotton, G.Wilkinson, C.A.Murillo and M.Bochmann, 6 Th Edition, Wiley Interscience, N.Y (1999
6. Inorganic Chemistry, J.E.Huheey , K.A.Keiter and R.L.Keiter 4 th Edition Harper Cottens College Publications (1993).
7. Inorganic Biochemistry Edited by G.L.Eichorn, Volume 1 Elsevier (1982).
8. The Chemistry of Metal Cluster Complexes. D.F.Shriver, H.D.Kaerz and R.D.Adams (Eds), VCH, NY (1990).
9. Inorganic Chemistry, Keith F.Purcell and John C.Kotz, Holt-Saunders International Editions, London (1977).
10. Bioinorganic Chemistry, I.Bertini, H.B.Gray, S.J.Lippard and S.J.Valentine, Viva Low-Priced Student Edition, New Delhi (1998).
11. Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, W.Kain and B.Schwederski, John Wiley and Sons, NY (1999).

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Paper-II: CH 202 T (Organic Chemistry)

OC-05: Reaction mechanism-II
OC-06: Pericyclic reactions-I
OC-07: Photochemistry
OC-08: Reactive intermediates and molecular rearrangements

OC-05: Reaction mechanism-II **15 hrs**

Nucleophilic Aromatic substitution: Aromatic Nucleophilic substitution: $S_N1(Ar)$, S_N2 (Ar), and benzyne mechanisms; evidence for the structure of benzyne. Von Richter rearrangement. Definition and types of ambident nucleophiles.

Neighbouring group participation : Criteria for determining the participation of neighbouring group. Enhanced reaction rates, retention of configuration, isotopic labeling and cyclic intermediates. Neighbouring group participation involving Halogens, Oxygen, Sulphur, Nitrogen, Aryl, Cycloalky l groups , σ and π- bonds. Introduction to nonclassical carbocations.

Electrophilic substitution at saturated carbon and single electron transfer reactions. Mechanism of aliphatic electrophilic sustitution. S_E1, S_E2, and S_Ei. SET mechanism.

OC-06 Pericyclic reactions **15 hrs**.

Introduction, Classification of pericyclic reactions,

Electrocyclic reactions: con rotation and dis rotation. Electrocyclic closure and opening in 4n and 4n+2 systems.

Cycloaddition reactions: suprafacial and antara facial additions in 4n and4n+2 cycloadditions.

Sigmatropic reactions: [i, j] shifts- suprafacial and antarafacial shifts, Cope and Claisen rearrangement reactions.

Approaches for the interpretation of mechanism of pericyclic reactions: Aromatic Transition States (ATS)/Perturbation Molecular Orbitals (PMO) approach-Concept of Huckel –Mobius aromatic and antiaromatic transition states. Framing Woodward-Hofmann selection rules for all the pericyclic reactions by ATS approach. Solving problems based on ATS approach.

Molecular orbitals: ethylene, 1, 3-butadiene, 1, 3, 5-hexatriene, allyl cation, allyl radical, pentadienyl cation, pentadienyl radical.

Frontier Molecular Orbital (HOMO-LUMO) approach-concept: Framing Woodward-Hofmann selection rules for all the pericyclic reactions by Frontier Molecular Orbital (FMO) approach. Solving problems based on FMO approach.

Conservation of orbital symmetry: (Correlation Diagrams) approach- for electrocylic and cycloadditions & cycloreversions.

OC-07 Photochemistry **15hrs**

Photochemistry: Photochemistry of π-π* transitions: Excited states of alkenes, cis-trans isomerisation, and photo stationary state. Photochemistry of 1,3-butadiene Electrocyclisation and sigmatropic rearrangements, di-π methane rearrangement. Intermolecular reactions, photocycloadditions, photodimeriastion of simple and conjugated olefins. Addition of olefins to α, β-unsaturated carbonyl compounds. Excited states of aromatic compounds, Photoisimerisation of benzene.

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Photochemistry of (n-π*) transitions: Excited states of carbonyl compounds, homolytic cleavage of α- bond, Norrish type I reactions in acyclic and cyclic ketones and strained cycloalkane diones.

Intermolecular abstraction of hydrogen: photoreduction-influence of temperature, solvent, nature of hydrogen donor and structure of the substrate.

Intramolecular abstraction of hydrogen: Norrish type II reactions in ketones, esters and 1,2 diketones, Addition to carbon-carbon multiple bonds, Paterno-Buchi reaction,

Photochemistry of nitrites-Barton reaction.

OC-08: Reactive intermediates and Molecular rearrangements 15 hrs

Reactive Intermediates: Generation, detection, structure, stability and reactions of carbocations, carbanions, carbenes, nitrenes and free radicals.

Molecular rearrangements: Definition and classification. Molecular rearrangements involving 1) electron deficient carbon: Wagner- Meerwein, Pinacol-Pinacolone, Allylic and Wolf rearrangement. 2) electron deficient Nitrogen: Hofmann, Lossen, Curtius, Schmidt and Beckmann rearrangements 3) electron deficient Oxygen: Baeyer-Villiger oxidation. 4) Base catalysed rearrangements: Benzilic acid, Favourski , Transannular , Sommlett-Hauser and Smiles rearrangement

References :

1. Stereochemistry of Carbon compounds by Ernest L Eliel / Samuel H. Wilen
2. Stereochemistry of organic compounds – Principles and Applications by D Nasipuri
3. The third dimension in organic chemistry, by Alan Bassindale
4. Stereochemistry: Conformation and Mechanism by P S Kalsi
5. Stereochemistry by V M Potapov
6. Advanced Organic Chemistry by Jerry March
7. Mechanism and Structure in Organic Chemistry S. Mukerjee
8. Organic chemistry Vol.I and II by I.L.Finar
9. Comprehensive organic chemistry Vol.5 D.H.R.Barton and W.D..Ollis

Paper CH 203 PHYSICAL CHEMISTRY

PC-05: Thermodynamics-II & Statistical Thermodynamics
PC-06: Photochemistry-I
PC-07: Quantum Chemistry-II
PC-08: Solid state chemistry

PC-05:Thermodynamics-II & Statistical Thermodynamics 15 hrs

Ideal solutions. Thermodynamic properties of ideal solutions. Mixing quantities. Vapour pressure -Raoult's law. Thermodynamic properties of ideally dilute solutions. Vapour pressure- Henry's law.

Nonideal systems. Concept of fugacity, fugacity coefficeient. Determination of fugacity. Non ideal solutions. Activities and activity coefficients. Standard-state conventions for non ideal solutions. Determination of activity coefficients from vapour pressure measurements. Activity coefficients of nonvolatile solutes using Gibbs-Duhem equation.

Multicomponent phase equilibrium: Vapour pressure lowering, freezing point depression and boiling point elevation

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Statistical Thermodynamics:

Partition Functions: Concepts of distribution and probability, Boltzmann distribution law. Interpretation of partition functions- translational, rotational, vibrational and electronic partition functions. Relationship between partition functions and thermodynamic functions (only S & G).

PC-06: Photochemistry –I **15 hrs**

Electronic transitions in molecules. The Franck Condon principle. Electronically excited molecules- singlet and triplet states. Radiative life times of excited states-theoretical treatment. Measured life times. Quantum yield and its determination. Experimental set up of a photochemical reaction. Actinometry-ferrioxalate and uranyl oxalate actinometers – problems. Derivation of fluorescence and phosphorescence quantum yields. E-type delayed fluorescence- evaluation of triplet energy splitting(ΔE_{ST}). Photophysical processes-photophysical kinetics of unimolecular reactions. Calculation of rate constants of various photophysical processes-problems, State diagrams

Photochemical primary processes. Types of photochemical reactions- electron transfer, photodissociation, addition, abstraction, oxidation and isomerization reactions with examples. Effect of light intensity on the rates of photochemical reactions. Photosensitization. Quenching-Stern-Volmer equation. Introduction to fast reactions- Principle of flash photolysis.

PC-07: Quantum chemistry-II **15 hrs**

Cartesian, Polar and spherical polar coordinates and their interrelations.

Schrodinger equation for the hydrogen atom- separation into three equations. Hydrogen like wave functions. Radial and angular functions. Quantum numbers *n, l and m* and their importance. The radial distribution functions. Hydrogen like orbitals and their representation. Polar plots, contour pots and boundary diagrams.

Many electron systems. Approximate methods. The variation method-variation theorem and its proof. Trial variation function and variation integral. Examples of variational calculations. Paricle in a box. Construction of trial function by the method of linear combinations. Variation parameters. Secular equations and secular determinant.

Bonding in molecules. Molecular orbital theory-basic ideas. Construction of MOs by LCAO, H_2^+ ion. The variationan integral for H_2^+ ion. Detailed calculation of Wave functions and energies for the bonding and antibonding MOs. Physical picture of bonding and antibonding wave functions. Energy diagram. The MO wave function and the energy of H_2 molecule MO by LCAO method and Valence bond method (detailed calculations not required)-comparison of MO and VB models.

PC-08: Solid state chemistry **15 Hrs**

Electronic properties of metals, insulators and semi-conductors: Electronic structure of solids, Band theory, band structure of metals, insulators and semi-conductors. Electrons, holes and Excitons. The temperature dependence of conductivity of extrinsic semi-conductors. Photo conductivity and photovoltaic effect – p-n junctions.

Superconductivity: Occurrence of superconductivity. Destruction of superconductivity by magnetic fields – Meissner effect. Types of superconductors. Theories of super conductivity – BCS theory.

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High temperature superconductors: Structure of defect perovskites. High T_c superconductivity in cuprates. Phase diagram of Y-Ba-Cu-O system. Crystal structure of $YBa_2Cu_3O_{7-x}$. Prepartion of 1-2-3 materials. Origin of high T_c superconductivity.

Nanoparticles and their applications:

Introduction to nanoparticles. Reduced dimensionality in solids – zero dimensional systems, fullerenes, quantum dots. One dimensional systems, carbon nano tubes, preparation of nano particles –top down and bottom up methods. Preparation of nanomaterials- – sol gel methods, and chemical vapour deposition method; thermolysis. Characterization of nanoparticles – experimental methods – powder X-ray diffraction, transmission electron microscopy (TEM), and atomic force microscopy (AFM) (detailed theory and instrumentation are not required). Optical properties of nanoparticles, Applications of nanoparticles.

References:

1. Atkin's Physical Chemistry, Peter Atkins and Julio de Paula, Oxford University press
2. Physical Chemistry, Ira N. Levine, McGraw Hill
3. Physical Chemistry-A Molecular approach, D.A. McQuarrie and J.D. Simon, Viva Books Pvt Ltd
4. Molecular Thermodynamics, D.A. McQuarrie and J.D. Simon, University Science Books
5. Quantum Chemistry, Ira N. Levine, Prentice Hall
6. Introduction to Quantum Chemistry, A.K. Chandra, Tata McGraw Hill
7. Introduction to Solids, Leonid V. Azaroff, Tata McGraw Hill
8. Solid state Chemistry, D.K. Chakrabarthy, New Age International
9. Solid state Chemistry and its aplications, A.R. West, Plenum.
10. Fundamentals of Photochemistry, K.K.Rohtagi-Mukherji, Wiley-Eastern
11. Molecular Photochemistry, N.J. Turro, Benjamin
12. Photochemistry, R.P.Kundall and A. Gilbert, Thomson Nelson
13. Essentials of Molecular Photochemistry by A. Gilbert and J. Baggott, Blackwell Scientific Publications.
14. Organic Photochemistry by J.M.Coxon and B.Halton, Cambridge University press.
15. Introductory Photochemistry by A.Cox and T.J.Kemp. McGraw-Hill, London.
16. Principles of the Solid State, H. V. Keer, New Age International
17. Elements of Physical Chemistry by Peter Atkins and Julio de Paula, Oxford University Press
18. Elements of Statistical Thermodynamics, L. K. Nash, Addison – Wesley
19. Introduction to Statistical Thermodynamics, T. L. Hill, Addison Wiley
20. Statistical Thermodynamics, M. C. Gupta, New Age International
21. Quantum Chemistry, D.A. McQuarrie, Prentice Hall
22. Elementary Quantum Chemistry, F. L. Pilar, McGraw Hill.
23. Nanostructured Materials and Nanotechnology, edited by Hari Singh Nalwa, Academic Press
24. Self-Assembled Nanostructures, Jin Zhang, Zhong-lin Wang, Jun Liu, Shaowei Chen & Gan-Yu-Liu, Kluwer Academic/Plenum
25. Introduction to Nanotechnology, Charles P. Poole Jr, F. J. Owens, Wiley India Pvt. Ltd.
26. The physics and chemistry of solids by Stephen Elliott, Wiley Publishers.
27. Introductory Photochemistry by A.Cox and T.J.Kemp. McGraw-Hill, London.

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Paper-IV: CH 204 (ANALYTICAL TECHNIQUES and SPECTROSCOPY - II)
ASP-05: Electro and thermal analytical Techniques.
ASP-06: NMR- II
ASP-07: Mass Spectroscopy
ASP-08: Photoelectron & ESR spectroscopy

ASP-05: Electro and thermal Analytical Techniques **15 hrs**

I: Types and Classification of Electro analytical Methods:

a) D.C Polarography:. Instrumentation - Dropping mercury electrode- -polarogram. Types of Currents: Residual, Migration, Limiting. Two and Three electrode assemblies. Ilkovic equation (derivation not necessary) and its consequences. Applications of polarography in qualitative and quantitative analysis. Analysis of mixtures. Application to inorganic and organic compounds. Determination of stability constants of complexes.

b) Brief account of following techniques and their advantages over conventional d.c.polargraphy.

(i) A.C.polarography (ii) Square-wave polarography (iii) Pulse polarography (iv) Differential pulse polarography

c) Amperometric titrations: Principle, Instrumentation. Types and applications of amperometric titrations. Determination of SO_4^{2-}, metal ions viz., Mg^{2+}, Zn^{2+}, Cu^{2+} and other substances.

d) Cyclic Voltammetry: Principle, instrumentation, Applications. Cyclic voltammetric study of insecticide parathion.

II: Thermal Analysis: Thermal techniques-Introduction, types of thermo analytical methods. Thermogravimetry principle and applications of thermogravimetry, differential thermal analysis- principle and applications of DTA. Differential scanning calorimetry. DSC: Principle, and application of DSC.

ASP 06: NMR spectroscopy-II (^{1}H, ^{19}F and ^{31}P NMR) 15 hrs

^{1}H, ^{19}F, ^{31}P and solid state NMR spectroscopy: First order and non first order spectra e.g., AX, AX_2, AX_3, A_2X_3, AMX and AB, ABC. Simplification of complex spectra: increased field strength, deuterium exchange, Lanthanide shift reagents and double resonance techniques. Discrimination of enantiomers by use of chiral NMR solvents (CSAs), chiral lanthanide shift reagents and Mosher's acid. Nuclear Overhauser enhancement (NOE). Fluxional moleculesbullvalene, [η5-C_5H_5M], [η5-$(C_5H_5)_2$ Ti η1-$(C_5H_5)_2$] and [η4$C_8H_8Ru(CO)_3$].

^{19}F NMR spectroscopy: ^{19}F chemical shifts, coupling constants. Applications of ^{19}F NMR involving coupling with ^{19}F, ^{1}H and ^{31}P: 1,2 dichloro-1,1 difluoro ethane, BrF_5, SF_4, PF_5, ClF_3, IF_5, CF_3CH_2OH

^{31}P NMR spectroscopy: ^{31}P chemical shifts, coupling constants. Applications of ^{31}P NMR involving coupling with ^{31}P, ^{19}F, ^{1}H and ^{13}C: ATP, Ph_3PSe, P_4S_3, H_3PO_4, H_3PO_3, H_3PO_2, HPF_2, PF_6^-, PH3, [Rh $(PPh_3)Cl_3$] (Rh I=1/2)

Introduction to solid state NMR: Magic angle spinning (MAS).Applications of solid state NMR.

ASP 07: Mass spectrometry **15 hrs**

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Origin of mass spectrum, principles of EI mass spectrometer. Types of fragments: odd electron and even electron containing neutral and charged species (even electron rule), Nitrogen rule, isotopic peaks, determination of molecular formula, metastable ion peaks. High resolution mass spectrometry. Salient features of fragmentation pattern of organic compounds including β-cleavage, Mclafferty rearrangement, retro Diels – Alder fragmentation and ortho effect. Principle of EI, CI, Fast Atom Bombardment (FAB), Secondary Ion Mass Spectrometry (SIMS), Electrospray (ESI) ionization and Matrix Assisted Laser Desorption Ionization (MALDI) methods. Introduction to principle and applications of Gas Chromatography-Mass Spectrometry (GC-MS) and Liquid chromatography-Mass Spectrometry (LC-MS) techniques.

ASP-08: Photoelectron & ESR sprectroscopy 15 hrs

Photoelectron Spectroscopy

Principle and Instrumentation, Types of Photoelectron Spectroscopy – UPS & XPS. Binding Energies, Koopman's Theorem, Chemical Shifts. Photoelectron Spectra of Simple Molecules: N2, O2, F2, - Vibrational Structure of PES Bands, Potential energy curves, Interpretation of Vibrational spectral data for ionized (M+) species, Prediction of Nature of Molecular Orbitals. ESCA in qualitative analysis, Principles of Auger electron spectroscopy.

Electron Spin Resonance

Introduction, principle, instrumentation, selection rules, interpretation of Lande's factor 'g'. Hyperfine and super hyperfine Coupling. Anisotropy in 'g' values and hyperfine coupling constants. Zero field splitting, Kramer's degeneracy and quadrupolar interactions.
Study of free radicals and transition metal complexes. Evidence for covalency in complexes, ex. Cu(II) Bissalcylaldimine, Bis-acetylacetanatovanadyl(II) and hexachloroiridium(IV) complexes.

References:

1. Spectroscopic identification of organic compounds by R.M. Silverstein and F.X. Webster.
2. Organic spectroscopy by William Kemp
3. Mass Spectrometry for Chemists and biochemists by M. Rose and R.A. W. Johnstone
4. Spectroscopic methods in organic chemistry by D.H. Williams and I. Fleming
5. Practical Pharmaceutical Chemistry by A. H. Beckett and J.B. Stenlake
6. Biological Mass Spectrometry by A.L. Burlingame
7. Principles and Practice of Biological Mass Spectrometry by Chhabil Das
8. Spectrscopic identification of organic compounds by R.M.Silverstein. G.C.Bassler and T.E.Morrill
9. NMR-A multinuclear introduction by William Kemp
10. Stereochemistry of Carbon compounds by Ernest L Eliel / Samuel H. Wilen
11. Principles of Polarography, Heyrovsky.
12. Principles of Polarography, Kapoor.
13. Modern Electroanalytical methods, edited by C.Charlot, Elsevier Company.
14. Principles of Instyrumental analysis, Skoog, Holler and Nieman, Harcourt Asia PTE Ltd.
15. Analytical Chemistry-An Introduction, Skoog, West, Holler and Crouch, Saunders College Publishing.
16. Prinicples of Instrumental Analysis, Skoog and Leary, Saunders College Publishing.
17. International series of Monographs, Vol. **53**: Photoelectron Spectroscopy, Edited by D. Beckerand D. Betteridge 1972.
18. Sructural methods in inorganic chemistry, E.A.V. Ebsworth

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Practicals:

Paper CH 251 : Inorganic chemistry practicals

I. Analysis of Two component mixtures:

(i). Separation of Ni^{2+} and Cu^{2+} Ni^{2+} Cu^{2+} (volumetric).

(ii). Separartion of Fe^{2+} Al^{3+} Fe^{2+} Al^{3+} gravimetrically.

(iii). Separartion of Ag^{+} Ca^{2+} Ag^{+} Ca^{2+} volumetrically

II. Analysis of three component mixtures:

(i). Separation of (Ni^{2+} and Cu^{2+}) from Mg^{2+} in the given mixture and estimation of Mg^{2+} (Gravi).

III Applied titrimetric analysis

(i) Determination of Iron and calcium in Cement

(ii) Determination of Calcium in calcium tablets

(iii) Determination of alkali content in antacid

IV. Ion exchange methods of analysis:

(i). Determination of capacity of an ion exchange resin.

(ii). Separation of Zinc and Magnesium on an anion exchange resin and estimation of Mg^{2+} and Zn^{2+}.

Suggested Books: (For both semesters).

1. (i). Text book of Quantitative Inorganic Analysis by A.I.Vogel, 3rd edition, ELBS 1969.
(ii). Vogel's text book of Quantitative Inorganic analysis. Jeffery etal, 4th edition, ELBS 1988.
(iii). Vogel's text book of Quantitative Inorganic Analysis. 6th edition, Pearson education ltd 2002.
2. Practical Inorganic chemistry By G.Marr and R.W.Rockett 1972.
3. Experimental Inorganic/Physical Chemistry – An Investigative integrated approach to Practical Project work. By Mounir A.Malati, 1999.
4. Advanced experimental Inorganic chemistry by. Ayodhya Singh.
5. Practical Inorganic Chemistry by G. Pass & H. Sutchiffe, 2nd edn John Wiley & sons

Paper CH 252 Organic Chemistry Lab 6 hours/ week

Identification of organic compounds systematic qualitative analysis:

Physical data BP / MP, Ignition test, solubility classification, Extra elements-N,S & Halogens, (Lassagnine sodium fusion test, Beilstein test)

Functional groups tests, Preparation of crystalline derivative and determination of their m.p.s and reference to literature to identify the compounds

A minimum of **8** following compounds to be studied as unknown covering atleast one from each of the solubility classes

Glucose, benzoic acid, 2-chloro benzoic Acid, Anisic acid, p-Nitrobenzoic acid; p-Cresol, p-

N,N-Dimethylaniline,Benzamide, Benzaldehyde, Anisaldehyde, Acetophenone,benzophenone,Ethylbenzoate,methylbenzoate,Nitrobenzene, chlorobenzene, bromobenzene , naphthalene, biphenyl anthracene.

Identification of unknown organic compounds from their IR, UV, ^{1}H nmr and MS.

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Analysis of recorded spectra of **6** compounds belonging to i) aromatic carboxylic acid ii) alcohols and phenols iii) aldehydes and ketones iv) amides v) esters vi) alkenes and alkynes

References

1. Text book of practical organic chemistry, Vogel
2. Text book of practical organic chemistry, Mann and Saunders.
3. Spectral identification of organic compounds Bassler, Silverstein 5th Edition

Paper CH 253: Physical Chemistry Lab: 6 hrs /week

Data analysis II: Mean and standard deviation; absolute and relative errors; linear regression; covariance and correlation coefficient.

Distribution:

1) Distribution of I_2 between hexanes / cyclo hexanes / CCl_4 and aq.KI solution- calculation of equilibrium constant.
2) Study of complex formation between ammonia and metal ion

Chemical Kinetics

1) Stoichiometry of peroxydisulphide- iodide reaction
2) Peroxydisulphide- iodide reaction: order w.r.t [by isolation method
?-] by initial rate method

Condutometry:

1) Titration of a mixture of strong and weak acids vs strong base
2) Determination of the hydrolysis constant of aniline hydrochloride
3) Determination of solubility product

Potentiometry:

1) Titration of Fe^{+2} vs $Cr_2O_7^{-}$ (redox titration)
2) Titration of Cl^- vs Ag^+ (precipitation titration)
3) Determination of solubility product

Polarimetry:

1) Determination of specific rotation of glucose and fructose
2) Enzyme catalysed inversion of sucrose

Colorimetry:

1) Verification of Beer's law and calculation of molar absorption coefficient using CuSO4 and KMnO4 solutions

pH metry:

1) Calibration of a pH meter and measurement of pH of different solutions
2) Preparation of phosphate buffers
3) Titration of strong acid vs strong base

References:

1. Senior Practical Physical Chemistry: B.D. Khosla, V.C. Garg and A. Khosla
2. Experimental Physical Chemistry: V. Athawale and P. Mathur.
3. Practical Physical Chemistry: B. Vishwanathan and P.S. Raghavan.
4. Practical in Physical Chemistry: P.S. Sindhu
5. Advanced Practical Physical chemistr: J.B.Yadav
6. Vogel Text book of Quantitative Analysis, 6th edition, Pearson education Ltd. 2002

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BOS Meeting Resolutions-2017-18, Department of Chemistry

The following resolutions were taken in the meeting.

1. Resolved to the adopt the syllabus prescribed by Osmania University for B.Sc.&M.Sc I to IV Semester without making any changes for the Academic year 2017-18.
2. The division and adoption of syllabus was discussed and decided to split the IV-units in every Semester of B.Sc. Each paper of M.Sc consists four chapters.
3. The pattern of evolution and examination was discussed with two internals in the each semester and average of two would be taken for the semester marks computation. The internals would be of 30 marks and the semester exams would be 70 marks.
4. The practical examinations would be conducted at the end of the every semester .
5. List of reference and prescribed books should mention for prescribing the students as recommended by Osmania University.
6. Question banks would be made for the students for the unit.
7. List of panel of examiner were enlisted for the purpose of evaluation of examinations.
8. Resolved to adopt the Skill Enhancement Course. In III Semester SEC is "Safety Rules in Chemistry Laboratory and Lab Reagents". 2 Credits allotted to SEC. In IV Semester SEC Syllabus is same as University prescribed.

Board of studies
Chairman BOs

University nominee

Board of Studies in Chemistry
Dept of Chemistry
Osmania University Hyd-7

Members

Telangana State Council of Higher Education, Govt. of Telangana B.Sc., CBCS Common Core Syllabi for all Universities in Telangana

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B.Sc., Chemistry

CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
FIRST YEAR- SEMSTER I				
BS 101	Communication	AECC-1	2	2
BS 102	English	CC-1A	5	5
BS 103	Second language	CC-2A	5	5
BS 104	Optional I	DSC-1A	4T+2P=6	4+1=5
BS 105	Optional II	DSC-2A	4T+2P=6	4+1=5
BS 106	**Optional III- Chemistry - I** **Laboratory Course – I (Qualitative Analysis – I)**	**DSC-3A**	**4T** **= 6** **2P**	**4** **=5** **1**
	Total Credits			**27**
FIRST YEAR- SEMSTER II				
BS 201	Environmental studies	AECC-2	2	2
BS 202	English	CC-1B	5	5
BS 203	Second language	CC-2B	5	5
BS 204	Optional I	DSC-1B	4T+2P=6	4+1=5
BS 205	Optional II	DSC-2B	4T+2P=6	4+1=5
BS 206	**Optional III- Chemistry - II** **Laboratory Course - II (Qualitative Analysis – II)**	**DSC-3B**	**4T** **= 6** **2P**	**4** **=5** **1**
	Total Credits			**27**
SECOND YEAR- SEMSTER III				
BS 301	**Safety Rules in Chemistry Laboratory and Lab Reagents**	**SEC-I**	2	2
BS 302	English	CC-1C	5	5
BS 303	Second language	CC-2C	5	5
BS 304	Optional I	DSC-1C	4T+2P=6	4+1=5
BS 305	Optional II	DSC-2C	4T+2P=6	4+1=5
BS 306	**Optional III- Chemistry - III** **Laboratory Course - III (Quantitative Analysis – I)**	**DSC-3C**	**4T** **= 6** **2P**	**4** **=5** **1**
	Total Credits			**27**
SECOND YEAR- SEMSTER IV				
BS 401	**Remedial Methods for Pollution, Drinking Water and Soil Fertility**	SEC-2	2	2
BS 402	English	CC-1D	5	5
BS 403	Second language	CC-2D	5	5
BS 404	Optional I	DSC-1D	4T+2P=6	4+1=5
BS 405	Optional II	DSC-2D	4T+2P=6	4+1=5
BS 406	**Optional III- Chemistry - IV** **Laboratory Course - IV (Quantitative Analysis – II)**	**DSC-3D**	**4T** **= 6** **2P**	**4** **= 5** **1**
	Total Credits			**27**

*__Optional III Chemistry__ AECC: Ability Enhancement Compulsory Course: SEC: Skill Enhancement Course DSC: Discipline Specific Course; GE: Generic Elective;

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Sc. Chemistry II Year
Semester III
Skill Enhancement Course- I (SEC-I)

301 SEC: Safety Rules in Chemistry Laboratory and Lab Reagents
Unit I: Laboratory Safety Rules and Regulations.
General rules and regulations for lab safety: Minimizing Risks of Hazards, Personal Protective Equipment (PPE) - Hair, Dressing for the Laboratory, Eye Protection, Eye-wash fountain, Gloves, Laboratory Protocols, Labeling Chemicals, Careful reading of labels Prevention of Inhaling Harmful Chemicals, Guide to Chemical Hazards, Chemical Spills etc,. Accidents use of fire extinguisher and first aid kit in the laboratory, safety symbols- Preparation of the charts by the students and display of chats in chemistry labs. Calibration of fractional weights, calibration of glass ware - burette, pipette, standard flask, Normality/Molarity and specific gravity of concentrated acids – Preparation of dilute solutions (Numerical problems). Precautions to be taken in the preparation of dilute acids and bases and bases. Preparation of stock solutions of salts with specific examples. Properties of primary standard salt and preparation of standard solution. Good laboratory practices-maintenance of observation book record.

UNIT 2: Preparation of Lab Reagents: Preparation of indicators and use of indicators in volumetric analysis- acid base titrations, redox titrations, precipitation titrations and complexometric titrations. Role of an indicator in detecting end point (Phenolphthalein, Methyl orange, Methyl-red, Potassium Chromate, Diphenylamine, EBT, Murexide, etc). Preparation of buffers – pH 10 ammonical buffer and acetate buffer solutions. Preparation of commonly used reagents : Ammonium hydroxide solution, Ammonium molybdate reagent, Ammonium hydrogen phosphate solution, Bayer's reagent, Benedict's solution, Bromine water, Dimethyl glyoxime reagent, 2,4-Dinitrophenyl hydrazine reagent, Eriochrome black-T reagent Fehling solution, Ferric chloride solution, Ferrous sulphate solution, Iodine solution, Molisch's reagent, Nessler's reagent, Neutral $FeCl_3$, Schiff's reagent, Silver nitrate solution, Sodium carbonate solution , Sodium hydroxide (Caustic soda) solution, Starch solution, Tollen's reagent.
(reference work and submission of assignments). Charts preparation depicting course content.

RECOMMENDED BOOKS

1. Vogel's Text Book of Quantitative Chemical Analysis, 5th edition.
2. Vogel's Text Book of macro and semimicro qualitative inorganic analysis. G. Svehla, 5th edition.
3. Chemistry Reagent Manual Prepared by Chemistry Department, SGTB Khalsa College under DBT's Star College Scheme, University of Delhi (Available: online)
4. American Chemical Society Safety in Academic Chemistry Laboratories 8th edition.

[Course objectives (CO)]
- □ To improve the skills of students in the application of theory and practical knowledge.
- □ To fill the gap between theory and practicals.
- □ To train the students in understanding laboratory safety rules and to improve the skills in preparation of laboratory reagents]

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Sc II yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER III
Paper-III
Chemistry - III

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S3-I-1: Chemistry of f-block elements: 6 h

Chemistry of Lanthanides**:**Position in periodic table,Electronic structure, oxidation state, ionic and atomic radii- lanthanide contraction- cause and consequences, anomalous behavior of post lanthanides-complexation- type of donor ligands preferred. Magnetic properties- paramagnetism. Colour and spectra, f-f transitions –occurrence and separation – ion exchange method, solvent extraction.

Chemistry of actinides- general features – electronic configuration, oxidation state, actinide contraction, colour and complex formation. Comparison with lanthanides.

S3-I-2: Symmetry of molecules 5 h

Symmetry operations and symmetry elements in molecules. Definition of Axis of symmetry types of C_n, Plane of symmetry (σh, σv, σd) Center of symmetry and improper rotational axis of symmetry (S_n). Explanation with examples.

S3-I-3: Non – aqueous solvents 4 h

Classification and characteristics of a solvent. Reactions in liquid ammonia – physical properties, auto-ionisation, examples of ammono acids and ammono bases. Reactions in liquid ammonia – precipitation, neutralization, solvolysis, solvation - solutions of metals in ammonia, complex formation, redox reactions. Reactions in HF – autoionisation, reactions in HF – precipitation, acid – base reactions, protonation.

Unit - II (Organic chemistry) 15 h (1 hr/week)

S3-O-1: Alcohols 6 h

Preaparation: 1°, 2° and 3° alchols using Griganard reagent, Ester hydrolysis, Reduction of Carbonyl compounds, carboxylic acids and esters. Physical properties: H-bonding, Boiling point and Solubility. Reactions with Sodium, HX/$ZnCl_2$ (Lucas reagent), esterification, oxidation with PCC, alk. $KMnO_4$, acidic dichromates, conc. HNO_3 and Oppenauer oxidation.

Diols: Pinacol - pinacolone rearrangement

Phenols: Preapartion: (i) from diazonium salts of anilines, (ii) from benzene sulphonic acids and (iii) Cumene hydroperoxide method.

Properties: Acidic nature, formation of phenoxide and reaction with R-X, electrophilic substitution nitration, halogenation and sulphonation. Riemer Tiemann reaction, Gattermann-Koch reaction, Azo-coupling reaction, Schotton-Boumann raction, Houben-Hoesch condensation, $FeCl_3$ reaction.

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S3-O-2: Ethers and epoxides **2 h**

Nomenclature, preparation by (a) Williamson's synthesis (b) from alkenes by the action of conc. H_2SO_4. Physical properties – Absence of Hydrogen bonding, insoluble in water, low boiling point. Chemical properties – inert nature, action of conc. H_2SO_4 and HI.

S3-O-3 Carbonyl compounds **7 h**

Nomenclature of aliphatic and aromatic carbonyl compounds and isomerism.

Praparation of aldehydes & ketones from acid chloride,1,3-dithianes, nitriles and from carboxylic acids. Special methods of preparing aromatic aldehydes and ketones by (a) Oxidation of arenes (b) Hydrolysis of benzal halides Physical properties – absence of Hydrogen bonding. Keto-enol tautomerism, polarisability of carbonyl groups, reactivity of the carbonyl groups in aldehydes and ketones. Chemical reactivity: Addition of [a] $NaHSO_3$ (b) HCN (c) RMgX (d) NH_3 (e) RNH_2 (f)NH_2OH(g) $PhNHNH_2$ (h) 2,4DNP (Schiff bases). Addition of H_2O to form hydrate (unstable), comparison with chloral hydrate (stable), addition of alcohols - hemi acetal and acetal formation. Base catalysed reactions with mechanism- Aldol, Cannizaro reaction, Perkin reaction, Benzoin condensation, haloform reaction, Knoevengeal condensation. Oxidation reactions – $KMnO_4$ oxidation and auto oxidation, reduction – catalytic hydrogenation, Clemmenson's reduction, Wolf- kishner reduction, Meerwein Pondoff Verly reduction, reduction with LAH, $NaBH_4$. Analysis – 2,4 –DNP test, Tollen's test, Fehlings test, Scihff'stest, haloform test (with equations).

.

UNIT – III (Physical Chemistry) **15 hr (1h/week)**

S3-P-1: Phase Rule **6 h**

Statement and meaning of the terms – Phase, Component and degrees of freedom, Gibb's Phase rule, phase equilibria of one component system – water system. Phase equilibria of two-component system – Solid-Liquid equilibria, simple eutectic – Pb-Ag system, desilverisation of lead. Solid solutions – compound with congruent melting point – Mg-Zn system and incongruent melting point – NaCl-H_2O system.

S3-P-2:Colloids& surface chemistry **9 h**

Definition of colloids. Classification of colloids. Solids in liquids (sols): preparations and properties – (including Kinetic, Optical and Electricalstability of colloids) Protective action. Hardy–Schultz law, Gold number. Liquids in liquids(emulsions): Types of emulsions, preparation and emusifier. Liquids in solids(gels); Classification, preparations and properties, General applications of colloids.

Micelles: Classification of surface active agents. Surfactant action, micellization and micellar interactions, Structure of micelles – spherical and laminar. Critical micellar concentration (CMC). Factors affecting the CMC of surfactants. Counter ion binding to micelles.

Adsorption: Types of adsorption, Factors influencing adsorption. Freundlich adsorption isotherm. Langmuir theory of unilayer adsorption isotherm. Applications**.**

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Unit –IV (General Chemistry) **15 h (1h/week)**

S3-G-1: ***Nanomaterials:*** **3h**

Nano structured materials – Definition, size, description of graphene, fullerenes, carbon nano tubes. Synthetic techniques, bottom-up-sol-gel method, top-down, electro deposition method. Production of carbon nano tubes – arc discharge, laser vaporization methods. General applications of nano materials.

S3-G-2: Stereochemistry of carbon compounds **10 h**

Isomerism: Definition of isomers. Classification of isomers: Constitutional and Stereoisomers - definition and examples. Constitutional isomers: chain, functional and positional isomers. Stereoisomers: enantiomers and diastereomers – definitions and examples.

Optical activity:Definition, wave nature of light, plane polarised light, optical rotation and specific rotation, chiral centers. Chiral molecules: definition and criteria - absence of plane, center and S_n axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans-1,2-dichlorocyclopropane). Molecules with constitutionally symmetrical chiral carbons (Tartaric acid) Molecules with constitutionally unsymmetrical chiral carbons (2,3-dibromopentane)Number of enantiomers and mesomers - calculation. D, L &, R, S configuration for asymmetric and disymmetric molecules (Allenes, spiro compounds and biphenyls), Cahn-Ingold-Prelog rules. Racemic mixture, Racemisation and Resolution techniques. Geometrical isomerism with reference to alkenes and cyclo alkanes– cis, trans and E, Z configuration.

S3-G-3: Conformational analysis **2 h**

Classification of stereoisomers based on energy. Definition and examples Conformational and configurational isomers. Conformational analysis of ethane, n-butane, 1,2-dichloroethane,2-chloroethanol and methylcyclohexane

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Referances:

Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications (1996).
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn Van Nostrand Reinhold Company(1977)
3.
4. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
5. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
6. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press (1989).
7. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press (1999).
8. Textbook of Inorganic Chemistry by R Gopalan(Universities Press(2012)
9. College Practical chemistry by V K Ahluwalia, Sunitha Dhingra and Adarsh Gulati Universities Press (India) Limited(2012)

Unit- II

1. Text book of organic chemistry by Soni. Sultan Chand & Sons; Twenty Ninth edition (2012)
2. General Organic chemistry by Sachin Kumar Ghosh. New Age Publishers Pvt Ltd (2008)
3. Text book of organic chemistry by Morrison and Boyd. Person(2009)
4. Text book of organic chemistry by Graham Solomons. Wiley(2015)
5. Text book of organic chemistry by Bruice Yuranis Powla. (2012)
6. Text book of organic chemistry by C N pillai CRC Press (2012)

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1. Principles of physical chemistry by Prutton and Marron. The Macmillan Company; 4th edition (1970)
2. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand & sons.(2011)
3. Text Book of Physical Chemistry by Puri and Sharma. S. Nagin chand and Co. (2017)
4. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
5. Colloidal and surface chemistry , M. Satake, Y. Hayashi, Y.Mido, S.A.Iqbal and M.S.sethi, Discovery Publishing Pvt.Ltd (2014)
6. Material science by Kakani & Kakani, New Age International(2016)

Unit IV

1. Text book of organic chemistry by Morrison and Boyd, Person(2009)
2. Text book of organic chemistry by Graham solomons, Wiley(2015)
3. Text book of organic chemistry by Sony, Sultan Chand & Sons; Twenty Ninth edition (2012)
4. Text book of organic chemistry by Bruice yuranis Powla, (2012)
5. General Organic chemistry by Sachin kumar Ghosh, New Age Publishers Pvt Ltd (2008)

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Laboratory Course

Paper III- Quantitative Analysis - I **45hrs (3 h / week)**

Acid - Base titrations

1. Estimation of Carbonate in Washing Soda.
2. Estimation of Bicarbonate in Baking Soda.
3. Estimation of Carbonate and Bicarbonate in the Mixture.
4. Estimation of Alkali content in Antacid using HCl.

Redox Titrations

1. Determination of Fe(II) using $K_2Cr_2O_7$
2. Determination of Fe(II) using $KMnO_4$ with sodium oxalate as primary standard.
3. Determination of Cu(II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard

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Sc. Chemistry II Year
Semester IV
Skill Enhancement Course- II (SEC -II)

401 SEC - REMEDIAL METHODS FOR POLLUTION, DRINKING WATER AND SOIL FERTILITY STANDARDS

UNIT I: Remedial Methods for Pollution

Prevention and control of air pollution, Ozone hole-causes and harm due to ozone depletion. The effect of CFC's in Ozone depletion and their replacements. Global Warming and Greenhouse Effect-Precautions to control global warming. Deleterious effect of pollutants - Endangered Monuments- acid rain. Precautions to protect monuments. Sources of Radiation pollution - Chernobyl accident and its Consequences. Radiation effect by the usage of cell phones and protection tips. Deleterious effects of cell phone towers and health hazards. Sources of water pollution-**(i).** Pollution due to pesticides and inorganic chemicals, **(ii).** Thermal pollution **(iii).** Ground water pollution **(iv).** Eutrophication. Methods for control of water pollution and water recycling. Dumping of plastics in rivers & oceans and their effect on aquatic life.

Determination of (i) Dissolved Oxygen and (ii) Chemical Oxygen Demand in polluted water - Illustration through charts **(or)** demonstration of experiments. Sources of soil pollution **(i).** Plastic bags, **(ii).** Industrial and **(iii).** Agricultural sources. Control of soil pollution.

Environmental laws in India. Environmental benefits of planting trees.

UNIT II: Drinking Water and Soil Fertility Standards and Analysis

Water Quality and Common Treatments for Private Drinking Water Systems: Drinking Water Standards-Primary Drinking Water Standards : Inorganics, Organics and Volatile Organic Chemical**s.** Secondary Drinking Water Standards-Inorganics and Physical Problems. Water Testing, Mineral Analysis, Microbiological Tests, Pesticide and Other Organic Chemical Tests. Principle involved in Water Treatment Techniques. (i) Reverse osmosis (ii) Disinfection methods such as chlorination, ultraviolet light, ozonation etc (iii) Chemical oxidation and (iv) Ion exchange (water softeners).
Visit to nearby drinking water plants and interaction at sites.

Introduction to Soil Chemistry- Basic Concepts. Effect of pH on nutrient availability. Macronutrients and their effect on plants -Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus other macronutrients-Calcium, Magnesium and Sulfur. Micronutrients and their effect on plants. Boron ($B_4O_7^{2-}$), Copper (Cu^{2+}), Iron (Fe^{2+}, Fe^{3+}) Manganese (Mn^{2+}) Molybdenum (MoO_4^{2-}) Zinc (Zn^{2+}) Cobalt (Co^{2+}) Chlorine (Cl^-) and Others. Determination of soil nitrogen by Kjeldahl method- Illustration through charts **(Or)** demonstration of experiment.

Visit to nearby agricultural forms and interaction with farmers. Discussion with farmers on the use of Soil Analysis Kits.

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References:

1. A Text book for 'Remedial methods for pollution, drinking water and soil fertility standards', First Edition, Authors: Dr Mudvath Ravi, Gopu Srinivas, Putta Venkat Reddy, Vuradi Ravi Kumar, Battini Ushaiah, ISBN No. 978-93-5311-183-0.
2. Remedial methods for pollution, drinking water and soil fertility standards, Author: Dr G. Vanjatha.
3. Remedial methods for pollution, drinking water and soil fertility standards, Telugu version, Authors: Dr N. Yogi Babu, Dr. G. Vanajatha, M. Srilatha.
4. Environmental Pollution, *download.nos.org/333courseE/10.pdf*

5. CFC Replacements, *butane.chem.uiuc.edu/pshapley/Environmental/L21/3.html*
6. Effects of Acid Rain on Buildings
www.air-quality.org.uk/12.php
7. Acid Rain Effects - Buildings - Chemistry
chemistry.elmhurst.edu/vchembook/196buildings.html
8. How to protect national heritage - ways to protect monuments
www.youthkiawaaz.com/2011/03/how-to-protect-national-heritage/.
9. Chernobyl nuclear power plant accident - NRC
www.nrc.gov/reading-rm/doc-collections/fact-sheets/chernobyl-bg.pdf
10. Side-effects of harmful radiation from mobile phones and towers
pib.nic.in/newsite/printrelease.aspx?relid=116304
11. Cell Phone Radiation Protection - 12 Highly Effective Tips *https:*
www.electricsense.com/775/how-to-protect-yourself-from-cell-phone-radiation/
12. Chemical Waste That Impact on Aquatic Life or Water Quality
blog.idrenvironmental.com/chemical-waste-that-impact-on-aquatic-life-or-water-quality
13. Trees and Your Environment - Clean Air Gardening
www.cleanairgardening.com/plantingtrees
14. water quality and common treatments for private drinking water .
extension.uga.edu/publications/detail.html?number=b939
15. Soil chemistry
https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/2.2-soil-chemistry.pdf
16. Soil Analysis-Determination of Available Nitrogen ... - Amrita Virtual Lab
vlab.amrita.edu/?sub=2&brch=294&sim=1551&cnt=1
17. Determination of dissolved oxygen (DO)
www.cutm.ac.in/pdf/env%20engg%20lab%20manual.pdf
18. Determination of chemical oxygen demand of wastewater
www.pharmaguideline.com › quality control › test

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Sc II yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER IV
Paper-IV
Chemistry - IV

Unit-I (Inorganic Chemistry) 15h (1 h/week)

S4-I-1: Coordination Compounds-I 7 h

Simple inorganic molecules and coordination complexes. Nomenclature – IUPAC rules, 1. Brief review of Werner's theory,Sidgwick's electronic interpretation and EAN rule and their limitations. (Valence bond theory (VBT) – postulates and application to (a) tetrahedral complexes $[Ni(NH_3)_4]^{2+}$, $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ **(**b) square planar complexes $[Ni(CN)_4]^{2-}$, $[Cu(NH_3)_4]^{2+}$, $[PtCl_4]^{2-}$ (c) octahedral complexes $[Fe(CN)_6]^{4-}$, $[Fe(CN)_6]^{-3}$, $[FeF_6]^{4-}$, $[Co(NH_3)_6]^{3+}$, $[CoF_6]^{3-}$. Limitations of VBT).2. Coordination number, coordination geometries of metal ions, types of ligands. 3. Isomerism in coordination compounds, stereo isomerism – (a)geometrical isomerism in (i) square planar metal complexes of the type$[MA_2B_2]$, $[MA_2BC]$, $[M(AB)_2]$, [MABCD]. (ii) Octahedral metal complexes of the type $[MA_4B_2]$, $[M(AA)_2B_2]$, $[MA_3B_3]$ using suitable examples, (b) Optical isomerism in (i). tetrahedral complexes [MABCD], (ii). Octahedral complexes $[M(AA)_2B_2]$, $[M(AA)_3]$ using suitable examples. Structural isomerism: ionization, linkage, coordination ligand isomerism using suitable examples.

S4-I-2:Organometallic Chemistry 4h

Definition, nomenclature and classification of organometallic compounds.Methods of preparation, properties and applications of alkyl and aryl compounds of Li, Mg &Al. Preparation and properties of ferrocene.

S4-I-3: Metal carbonyls and related compounds 4h

18 valence electron rule, classification of metal carbonyls: $Ni(CO)_4$, $Fe(CO)_5$, $Fe_2(CO)_9$, $Fe_3(CO)_{12}$ and $Cr(CO)_6$, Preparation and properties of $Ni(CO)4$.

UNIT - II (Organic chemistry) 15 h (1 hr/week)

S4-O-1: Carboxylic acids and derivatives 6h

Nomenclature, classification and methods of preparation a) Hydrolysis of Nitriles, amides and esters. b) Carbonation of Grignard reagents. Special methods of preparation of Aromatic Acids. Oxidation of the side chain of Arenes. Hydrolysis of benzotrichlorides. Kolbe reaction. Physical properties- hydrogen bonding, dimeric association, acidity – strength of acids with the examples of trimethyl acetic acid and trichloro acetic acid, Relative differences in the acidity of Aromatic, aliphatic acids& phenols. Chemical properties – Reactions involving H, OH and COOH groups -salt formation, anhydride formation, Acid halide formation, Esterification (mechanism) & Amide formation. Reduction of acid to the corresponding primary alcohol - via ester or acid chloride. Degradation of carboxylic acids by Huns Diecker reaction, Schmidt reaction (Decarboxylation). Arndt – Eistert synthesis, Halogenation by Hell – Volhard - Zelensky reaction. Carboxylic acid Derivatives – Reactions of acid halides, Acid anhydrides, acid amides and esters (mechanism of ester hydrolysis by base and acid).

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S4-O-2: Synthesis based on Carbanions **3 h**

Acidity of -Hydrogens of withdrawing groups, structure of carbanion. Preparation of Aceto acetic ester (ethylacetoester) by Claisen condensation and synthetic application of Aceto acetic ester. (a) Acid hydrolysis and ketonic hydrolysis: Butanone, 3-Methyl 2-butanone. Preparation of (i) monocarboxylic acids ii) dicarboxylic acids (b) malonic ester– synthetic applications. Preparation of (i) substituted mono carboxylic acids and (ii) substituted dicarboxylic acids.

S4-O-3Nitro hydrocarbons: **6 h**

Nomenclature and classification of nitro hydrocarbons. Structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity - halogenation, reaction with HNO_2 (Nitrous acid), Nef reaction, Mannich reaction,Michael addition and reduction. Aromatic Nitro hydrocarbons: Nomenclature, Preparation of Nitrobenzene by Nitration. Physical properties, chemical reactivity – orientation of electrophilic substitution on nitrobenzene. Reduction reaction of Nitrobenzenes in different media.

Unit – III (Physical Chemistry) **15 hr(1h/week)**

S4-P-1: Electrochemistry & EMF **15 h**

Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific and equivalent conductance with dilution. Migration of ions and Kholrausch's law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf's method for attackable electrodes. Applications of conductivity measurements: Determination of degree of dissociation, determination of K_a of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Electrolyte and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurement. Computation of EMF. Types of reversible electrodes- the gas electrode, metal-metal ion, metal-insoluble salt and redox electrodes. Electrode reactions, Nernst equation, cell EMF and single electrode potential, standard Hydrogen electrode – reference electrodes (calamel electrode) – standard electrode potential, sign conventions, electrochemical series and its significance.

Applications of EMF measurements, Calculation of thermodynamic quantities of cell reactions (G, H and K). Determination of pH using hydrogen electrode, glass electrode and quinhydrone electrode, Solubility product of AgCl. Potentiometric titrations.

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Unit –IV (General Chemistry) **15 h (1h/week)**

S4-G-1: Pericyclic Reactions **5 h**

Concerted reactions, Molecular orbitals of ethene,1,3-butadiene and allyl radical. Symmetry properties, HOMO, LUMO, Thermal and photochemical pericyclic reactions. Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each and their explanation by FMO theory.

S4-G-2: Synthetic Strategies **5 h**

Terminology – Target molecule (TM), Disconnection approach – Retrosynthesis, Synthon, Synthetic equivalent (SE), Functional group interconversion (FGI), Linear,
Convergent synthesis. Retrosynthetic analysis of the following molecules: 1) acetophenone 2) cyclohexene and 3) phenylethylbromide.

S4-G-3: **Asymmetric synthesis** **5 h**

Definition and classification of stereoslective reactions: substrate, product stereoselective reactions, enantio and diastereo selective reactions. Stereospecific reaction – definition – example – dehalogenation of 1,2-dibromides induced by iodide ion. Enantoselective reactions – definition – example –Reduction of Ethylacetoacetate by Yeast. Diastereoselective reaction-definition-example:Acid catalysed dehydration of 1-phenylproponal and Grignard addition to 2-phenyl propanal. Definition and explanation of enantiomeric excess and diastereomeric excess.

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2. Concise Inorganic Chemistry by J.D. Lee 3rd edn. Van Nostrand Reinhold Company(1977)
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press (1989).
6. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press (1999).
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3. Text Book of Physical Chemistry by Puri and Sharma. S. Nagin chand and Co. (2017)
4. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
5. Physical Chemistry through problems by S.K. Dogra. (2015)
6. Text Book of Physical Chemistry by R.P. Verma.
7. Elements of Physical Chemistry byLewis Glasstone. Macmillan (1966)
8. Industrial Electrochemistry, D. Pletcher, Chapman & Hall, London, 1990

Unit IV

1. Text book of organic chemistry by Morrison and Boyd, Person(2009)
2. Text book of organic chemistry by Graham solomons, Wiley(2015)
3. Fundamentals of organic synthesis and retrosynthetic analysis by Ratna Kumar Kar, NCBA,(2014)
4. Organic synthesis by Dr. Jagadamba Singh and Dr. L.D.S. Yadav, Pragati Prakashan, 2010
6. Stereochemistry of organic compounds by D. Nasipuri, New Academic Science Limited, 2012
7. Organic chemistry by Clayden, Greeves, Warren and Wothers, Oxford University Press, 2001
8. Fundamentals of Asymmetric Synthesis by G. L. David Krupadanam, Universities ress(2014)

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Laboratory Course

Paper IV- Quantitative Analysis - II **45hrs (3h/ week))**

1. Conductometry titrations:
   i) Strong acid Vs Strong base;
   ii) Weak acid Vs Strong base.
2. Potentiometry titration:
   i) Strong acid Vs Strong base;
   ii) Weak acid Vs Strong base.
3. Estimation of Nickel by back titration (Standard $MgSO_4$ solution will be given)
4. Estimation of Barium as Barium Sulphate

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Sc. CHEMISTRY

ORGANIC CHEMISTRY SPECIALISATION
SYLLABUS OF III & IV SEMESTERS
REVISED AS PER NEW (CB) SYLLABUS

FOR STUDENTS ADMITTED FROM THE YEAR 2016 ONWARDS

Sc. CHEMISTRY (ORGANIC CHEMISTRY SPECIALISATION)

Syllabus for III and IV Semesters

(for the batches admitted in academic year 2016 & later under CBCS pattern)

[Under Restructured CBCS Scheme]

Grand total marks and credits (all 4 semesters) 2400 marks – 96 credits

(Approved in the P.G.BOS meeting held on 01-07-2017)

SEMESTER-III

Paper	Instruction Hrs/Week	Internal assessment marks*	Semester marks	Total marks	Total credits
CH(OC)301T	4	20	80	100	4
CH(OC)302T	4	20	80	100	4
CH(OC)303T	4	20	80	100	4
CH(OC)304T	4	20	80	100	4
CH(OC)351P	9	-	100	100	4
CH(OC)352P	9	-	100	100	4
Total				**600**	**24**

SEMESTER - IV

Paper	Instruction Hrs/Week	Internal assessment marks*	Semester marks	Total marks	Total credits
CH(OC)401T	4	20	80	100	4
CH(OC)402T	4	20	80	100	4
CH(OC)403T	4	20	80	100	4
CH(OC)404T	4	20	80	100	4
CH(OC)451P	9	-	100	100	4
CH(OC)452P	9	-	100	100	4
Total				**600**	**24**

**** 15 marks for the written test and 5 marks for the assignment***

Grand total all 4 semesters: 2400 marks and 96 credits

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PAPER TITLES , M.Sc. ORGANIC CHEMISTRY SPECIALISATION
(For the batch admitted during the academic year 2016 onwards under the CBCS pattern)

[Under Restructured CBCS Scheme]

III SEMESTER SYLLABUS	IV SEMESTER SYLLABUS
Paper-1CH (OC) 301T: Synthetic Reagents, Advanced NMR, Conformational Analysis and ORD OC-09: Synthetic Reagents-I OC-10: Synthetic Reagents-II OC-11: ^{13}C NMR and 2D NMR spectroscopy OC-12: Conformational analysis (Cyclic systems) and ORD	**Paper-1 CH (OC) 401T: Drug Design and Drug Discovery** OC-17: Principles of Drug design and drug discovery OC-18: Lead modification and SAR Studies OC 19: QSAR studies and computer aided drug design OC 20: Combinatorial Synthesis
Paper II– CH (OC) 302T: Modern Organic Synthesis OC-13: Asymmetric synthesis OC-14: Synthetic strategies OC-15: New Synthetic reactions OC-16:New techniques and concepts in organic synthesis	**Paper-II CH (OC) 402T:Drug synthesis and mechanism of action** OC-21: Drugs acting on metabolic process, cell wall and specific enzymes OC-22: Drugs acting on genetic material and immune system OC-23: Drugs acting on receptors and ion channels OC-24: Chiral drugs
Elective-3A **Paper-IIICH (OC)303T (CB1): Bioorganic Chemistry** OC(CB1)-1: Carbohydrates OC(CB1)-2: Nucleic acids and Lipids OC(CB1)-3: Proteins and Enzymes OC(CB1)-4: Coenzymes and Vitamins	**Elective-3A** **Paper-III CH (OC)-403T (CB1): Advanced Heterocyclic Chemistry** OC (CB1) 17: Non aromatic heterocyclics& aromaticity OC (CB1)18: Five and six membered heterocyclics with two hetero atoms OC (CB1) 19: Heterocyclics with more than two hetero atoms OC (CB1) 20: Larger ring and other heterocycles
Elective-3B: **Paper-III CH (OC) 303T (CB2): Forensic Chemistry and Toxicology** OC(CB2)-5: Forensic chemistry- I OC(CB2)-6: Forensic chemistry- II OC(CB2)-7: Forensic Toxicology-I OC(CB2)-8: Forensic Toxicology-II	**Elective-3B** **Paper-III CH (OC)-403T (CB2): Polymers , dyes and Pigments** OC (CB2) 21: Polymers- I OC (CB2) 22: Polymers- II OC (CB2) 23: Dyes-I OC (CB2) 24: Dyes-II and pigments
Elective-4A **Paper-IV CH (OC) 304T (CB3): Green chemistry and Organic materials** OC (CB3) - 9: Principles of Green chemistry OC (CB3) -10: Green Synthesis OC (CB3) -11: Organic nanomaterials OC (CB3) -12: Supramolecular chemistry	**Elective-4A (ID Paper)** **Paper-IV CH (OC) 404(CB3)T: Advanced Natural Products** OC(CB3)-25: Biosynthesis of natural products OC(CB3)-26: Structure determination of natural products -I OC(CB3)--27: Structure determination ofnatural products-II OC(CB3)--28: Total stereo selective synthesis of natural products.
Elective-4B **Paper-IV CH (OC) 304T (CB4): Pesticides** OC (CB4) - 13: Introduction to pesticides OC (CB4) - 14: Synthetic insecticides OC (CB4) - 15: Natural insecticides & herbicides OC (CB4) - 16: Fungicides, and Rodenticides	.**Elective-4B (ID Paper)** **Paper-IVCH (OC) 404 (CB4) T: Biopharmaceutics and Pharmacodynamics** OC(CB4)-29 : Pharmacokinetics OC(CB4)-30 : Pharmacodynamics OC(CB4)-31 : Principles of Therapeutics OC(CB4)-32: Drug Interactions
LABORATORY COURSES **Paper-V CH (OC) 351P**: Synthesis of organic molecules, isolation of natural products & TLC. **Paper-VI CH (OC) 352P**: Separation and identification of organic compounds & Column chromatography	**LABORATORY COURSES** **Paper-V CH (OC) 451P**: Spectroscopic identification of organic compounds & practice of chemistry software prgrammes **Paper- VI CH (OC) 452P**: Synthesis and analysis of drugs

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Sc. ORGANIC CHEMISTRY SPECIALISATION
III SEMESTER SYLLABUS

(For the batch admitted during the academic year 2016-2017)

Paper-1CH (OC) 301T: Synthetic Reagents, Advanced NMR,Conformational Analysis and ORD

OC-09: Synthetic Reagents-I
OC-10: Synthetic Reagents-II
OC-11: ^{13}C NMR and 2D NMR spectroscopy
OC-12: Conformational analysis (Cyclic systems) & ORD

Paper II– CH (OC) 302T: Modern Organic Synthesis

OC-13: Asymmetric synthesis
OC-14: Synthetic strategies
OC-15- New Synthetic reactions
OC-16: New techniques and concepts in organic synthesis

Elective-3A Paper-III CH (OC)303T (CB1): Bioorganic Chemistry

OC(CB1)-1: Carbohydrates
OC(CB1)-2: Nucleic acids and Lipids
OC(CB1)-3: Proteins and Enzymes
OC(CB1)-4: Coenzymes and Vitamins

Elective-3B: Paper-III CH (OC) 303T (CB2): Forensic Chemistry andToxicology

OC(CB2)-5: Forensic chemistry- I
OC(CB2)-6: Forensic chemistry- II
OC(CB2)-7: Forensic Toxicology-I
OC(CB2)-8: Forensic Toxicology-II

Elective-4A Paper-IV CH (OC) 304T (CB3): Green chemistry and Organic materials

OC (CB3) - 9: Principles of Green chemistry
OC (CB3) -10: Green Synthesis
OC (CB3) -11: Organic nanomaterials
OC (CB3) -12: Supramolecular chemistry

Elective-4B Paper-IV CH (OC) 304T (CB4): Pesticides

OC (CB4) - 13: Introduction to pesticides
OC (CB4) - 14: Synthetic insecticides
OC (CB4) - 15: Natural insecticides & herbicides
OC (CB4) - 16: Fungicides, and Rodenticides

Laboratory courses:

Paper-V CH (OC) 351P: Synthesis of organic molecules, isolation of natural products and TLC.

Paper-VI CH (OC) 352P: Separation and identification of organic compounds & Column chromatography.

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M.Sc. CHEMISTRY (ORGANIC CHEMISTRY)
III SEMESTER SYLLABUS

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(For the batch admitted during the academic year 2016 -2017 under the CBCS pattern)

Paper-1CH (OC) 301T: Synthetic Reagents, Advanced NMR, Conformational Analysis and ORD

OC-09: Synthetic Reagents-I
OC-10: Synthetic Reagents-II
OC-11: ^{13}C NMR and 2D NMR spectroscopy
OC-12: Conformational analysis (Cyclic systems) & ORD

OC-09: Synthetic Reagents I 15 Hrs

i)Protecting groups: a) Protection of alcoholsby ether, silyl ether and esterformation b) Protection of 1,2-diols by acetal, ketal and carbonate formation c) Protection of amines by benzyloxycarbonyl, t-butyloxycarbonyl,fmoc and triphenyl methyl groups. d) Protection of carbonyls by acetal, ketal and thiol acetal (Umpolung)groups. e) Protection of carboxylic acids by ester and ortho ester (OBO) formation.

ii) Organometallic Reagents: Preparation and application of the following in organic synthesis: 1) Organolithium 2) Organo copper reagents3) Organoboranes in C-C bond formation 4) Organo silicon reagents: reactions involving β-carbocations and α-carbanions, utility of trimethyl silyl halides, cyanides and triflates.

iii) Carbonyl methylenation:a) Phosphorousylide mediated olefination 1) Witting reaction, 2) Horner-Wordsworth-Emmons reaction.b) Titanium- Carbene mediated olefination 1) Tebbe reagent, 2) Petasis reagent 3) Nysted reagent.

iv) Carbene insertions: Rh based carbene complexes, cyclopropanations.

v) C-H Activation: Introduction, Rh catalysed C-H activation.

OC-10:Synthetic Reagents II 15 Hrs

i)Oxidations: a) Oxidation of active C-H functions: DDQ and SeO_2.b) Alkenes to diols: Prevost and Woodward oxidation c) Alcohol to carbonyls:Cr^{VI} oxidants (Jones reagent, PCC, PDC) IBX, DMP, CAN, TEMPO, TPAP, Swern oxidation d) Oxidative cleavage of 1,2-diols: Periodic acid and Lead tetra acetate.

ii) Reductions: a) Catalytic hydrogenation: Homogenous (Wilkinsons's catalytic hydrogenation)and heterogeneous catalytic reduction. b) Non-metallic reductions: Diimide reduction c)Dissolving metal reductions: Birch reduction. d) Nucleophilic metal hydrides: $LiAlH_4$, $NaBH_4$, and their modifications.e) Electrophilic metal hydrides: BH_3, AlH_3 and DIBAL. f) Use of tri-n-butyl tin hydride: Radical reductions.

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OC-11: ^{13}C NMR and 2D NMR spectroscopy 15 Hrs

i)^{13}C NMR spectroscopy: Introduction**,** Types of ^{13}Cnmr spectra: undecoupled, proton-

decoupled and off-resonance decoupled (ORD) spectra. ^{13}C chemical shifts, factors affecting the chemical shifts, chemical shifts of organic compounds. Calculation of chemical shifts of alkanes, alkenes and alkynes. Homonuclear (^{13}C, ^{13}C J) and heteronuclear (^{13}C,^{1}H J and ^{13}C, ^{2}H J) coupling. Applications of ^{13}C-NMR spectroscopy: Structure determination, stereochemistry, reaction mechanisms and dynamic processes in organic molecules. ^{13}C-NMR spectral editing techniques: principle and applications of APT, INEPT and DEPT methods.

ii) 2D-NMR spectroscopy: Principles of 2D NMR, Classification of 2D-experiments. Correlation spectroscopy (COSY) HOMOCOSY (^{1}H-^{1}H COSY) , TOCSY (Total Correlation Spectroscopy), HeteroCOSY (^{1}H,^{13}C COSY,HMQC), long range ^{1}H,^{13}C COSY (HMBC),Homonuclear and Heteronuclear 2D-J-resolved spectroscopy, NOESY and 2D-INADEQUATE experiments and their applications.

OC-12: Conformational analysis (Cyclic systems) & ORD15 Hrs

Conformational analysis (Cyclic systems)

Study of conformations of cyclohexane, mono, di and tri substituted cyclohexanes, (1,3,5-trimethyl cyclohexanes and Menthols), cyclohexanone (2-alkyl and 3 -alkyl ketone effect), 2-halocyclohexanones, cycloheptane . Stereo chemistry of bicyclo[3,3,0]octanes,hydrindanes, decalins and perhydroanthracenes. Conformational structures of piperidine, N-Methylpiperidine, tropane, tropine, pseudotropine, decahydroquinolineand quinolizidine. Factors governing the reactivity of axial and equatorial substituents in cyclohexanes.

(oxidation, S_N2 reaction, rearrangements, Ester hydrolysis) Stereochemistry of addition to the carbonyl group of a rigid cyclohexanone ring.

Optical Rotatory Dispersion (ORD) and CD Spectroscopy: Optical rotation, circular birefringence, circular dichroism and Cotton effect. Plain curves and anomalous curves. Empirical and semiempiricalrules-The axial haloketone rule, the octant rule, Helicity rule, Exciton chirality method. Application of the rules to the study of absolute configuration and conformations of organic molecules.

Recommended Books:

1. Some modern methods of organic synthesis by W. Carruthers
2. Guidebook to organic synthesis, by R K Meckie, D M Smith & R A Atken
3. Organic Synthesis by O House
4. Organic synthesis by Micheal B Smith
5. Reagents for organic synthesis, by Fieser&Fieser, Vol 1-11 (1984)
6. Organic synthesis by Robert E Ireland
7. Handbooks of reagents for organic synthesis by Reich and Rigby, Vol-I-IV
8. Organic chemistry by Jonathan Clayden, Nick Greeves and Stuart Warren
9. Organic Reactions and their mechanisms by P.S.Kalsi
10. Organic reaction mechanisms by V.K.Ahulwalia and Rakesh Kumar Parashar
11. Spectroscopic identification of organic compounds by RM Silverstein, G C Bassler and T B Morrill
12. Organic Spectroscopy by William Kemp
13. Spectroscopic methods in Organic chemistry by DH Williams and I Fleming
14. Modern NMR techniques for chemistry research by Andrew B Derome

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15. NMR in chemistry - A multinuclear introduction by William Kemp
16. Spectroscopic identification of organic compounds by P S Kalsi
17. Introduction to organic spectroscopy by Pavia
18. Carbon-13 NMR for organic chemists by GC Levy and O L Nelson
19. Nuclear Magnetic Resonance Basic principles by Atta-ur-Rahman
20. Basic one and two-dimensional NMR spectroscopy by Horst Friebolin
21. NMR spectroscopy by H.Gunther
22. Stereochemistry of organic compounds — Principles & Applications by D Nasipuri
23. Stereochemistry of Carbon compounds by Ernest L Eliel & Samuel H. wilen
24. Stereochemistry: Conformation & Mechanism by P S Kalsi
25. The third dimension in organic chemistry, by Alan Bassendale
26. Stereo selectivity in organic synthesis by R S Ward.
27. Advanced organic chemistry. Part A Structure & Mechanism by Francis A. Corey and Richard J. Sundberg
28. Optical rotatory dispersion by C Djerassi
29. Optical rotatory dispersion and circular dichroism by P Crabbe
30. Mechanism and Structure in Organic chemistry by S Mukherjee

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Paper II– CH (OC) 302T:Modern Organic Synthesis

OC-13: Asymmetric synthesis
OC-14: Synthetic strategies

OC-15: New Synthetic reactions
OC-16: New techniques and concepts in organic synthesis

OC- l3:- Asymmetric synthesis15 Hrs

Introduction: Brief revision of classification of stereo selective reactions

Prostereoisomerism: Topicity in molecules Homotopic, stereoheterotopic (enantiotopic and diastereotopic) groups and faces- symmetry criteria.

Prochiral nomenclature: Pro chiraility and Pro-R, Pro-S, Re and Si.

Conditions forstereoselectivity: Symmetry and transition state criteria, kinetic and thermodynamic control. Methods of inducing enantioselectivityy.

Analytical methods: % Enantiomeric excess and diastereomeric ratio. Determination of enantiomeric excess: specific rotation, Chiral NMR; Chiralderivatizing agents, Chiral solvent, Chiral shift reagents and Chiral HPLC.

Chiral Substrate controlled asymmetric synthesis: Nucleophilic additions to chiral carbonyl compounds. 1, 2- asymmetric induction, Cram's rule and Felkin-Anh model.

Chiral auxiliary controlled asymmetric synthesis: α-Alkylation of chiral enolates, Evan's oxazolidinone, 1, 4-Asymmetric induction and Prelog's rule..

Chiral reagent controlled asymmetric synthesis: Asymmetric reductions using BINAL-H. Asymmetric hydroboration using IPC_2 BH and $IPCBH_2$.

Chiral catalyst controlled asymmetric synthesis: Sharplessepoxidation. Asymmetric hydrogenations using chiral Wilkinson biphosphincatalyst.

Asymmetric aldol reaction: Diastereoselective aldol reaction (achiral enolate& achiral aldehydes) its explanation by Zimmerman-Traxelmodel.

OC-14: SyntheticStrategies15 Hrs

Introduction: Terminology, Target, synthon, synthetic equivalent, functional group interconversion (FGI), functional group addition. Criteria for selection of target. Linear and convergent synthesis. Retrosynthetic analysis and synthesis involvingchemoselectivity, regioselectivity, reversal of polarity and cyclizations. .

Order of events: S-Salbutamol, Propoxycaine..

One group C-C and C-X disconnections: Introduction .One group C-C disconnections in alcohols and carbonyl compounds. One group C-X disconnections in Carbonyl compounds, alcohols,ethers and sulphides.

Two group C-C and C-X disconnections : Introduction .Two group C-X disconnections in 1,1-difunctionalised, 1,2-difunctionalised and 1,3-difunctionalised compounds.

Two group C-C disconnections: Diels-Alder reaction, 1,3-difunctionalised compounds, 1,5-difunctionalised compounds, Michael addition and Robinson annulation.

Control in carbonyl condensations:oxanamide and mevalonic acid.

Strategic bond: definition, guidelines for disconnection; disconnection of C-X bonds, disconnect to greatest simplification, using symmetry in disconnection, disconnection corresponding to known reliable reaction, high yielding steps and recognizable starting materials. Retrosynthesis ofRetronecene, longifoline.

OC-15: New Synthetic reactions **15 Hrs**

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1. Metal mediated C-C and C-X coupling reactions: Suzuki, Heck, Stille,Sonogishira crosscoupling,Buchwald-Hartwigand Negishi-Kumadacoupling reactions.

2. C=C Formation Reactions: Shapiro, Bamford-Stevens, McMurreyreactions,Julia-Lythgoeolefinationand Peterson's stereoselective olefination.

3. Multicomponent Reactions: Ugi,Passerini, Biginelli, Bergman and Mannichreactions.

4. Ring Formation Reactions: Pausan-Khand reaction, Nazerov cyclisation.

5. Click Chemistry: Click reaction, 1,3-dipolar cycloadditions.

6.Metathesis: Grubb's 1st and 2nd generation catalyst, Olefin cross coupling metathesis(OCM), ring closing metathesis(RCM), ring opening metathesis(ROM), applications.

7. Other important synthetic reactions: Baylis-Hilman reaction,Eschenmoser-Tanabe fragmentation,Mitsunobu reaction,Stork-enamine reaction and Michael reactions.

OC-16: New techniques and concepts in organic synthesis 15 Hrs

1. Techniques in peptide synthesis: Solid phase peptide synthesis, commonly used resins (Rink resin, Wang resin and Ellman resin,synthesis of cross linked Merrifield resin and drawbacks of solid phase synthesis.

2. Solid phase oligodeoxynucleotide synthesis: Phosphotriester, phosphitetriester and phosphoramidite pathway

3. Oligosaccharide synthesis: Glycosidation**:**cylicoxocarbeniumion, glycosyl donors and glycosyl acceptors, Kahneglycosidation, convergent and linear oligosaccharide synthesis.

4. Phase Transfer catalysis: Onium and crwon ethers as PTC.

5. Tandem synthesis: Tandem reactions; conjugate addition-aldol reaction, polymerization-cyclisation, elctrocylic-Diels Alder reaction.

6. Baldwin Rules: Exo and Endo cyclisation, tetrahedral, trigonal and diagonal systems, favoured and disfavouredcyclisations.

7.Chiron approach in organic synthesis: Nature's chiral pool, carbohydrates, amino acids, hydroxy acids, terpenes as chiral precursors. Synthesis of shikimic acid from D-arabinose, furanonycin from D-glucose, S-(-)-ipsenol from S-leucine.

8) Determination of absolute configuration: Mosher's method.

Recommended Books:

1. Asymmetric synthesis by Nogradi
2. Asymmetric organic reactions by J D Morrison and H S Moschcr
3. Principles in Asymmetric synthesis by Robert E. Gawley&Jeffrey aube
4. Stereo differentiating reactions by Izumi
5. Some modern methods of organic synthesis by W Carruthers
6. Guidebook to organic synthesis, by R K Meckie, D M Smith & R A Atken
7. Organic synthesis by Michael B Smith
8. Organic Synthesis-The disconnection approach by S Warren
9. Organic Synthesis by C Willis and M Willis
10. Problems on organic synthesis by Stuart Warren
11. Organic chemistry Jonathan Clayden, Nick Greeves and Stuart Warren
12. The logic of chemical synthesis by Elias James Corey and Xue-Min Cheng
13. Name reactions by JieJacj Li

Elective-3A

Paper-III CH (OC)303T (CB1): Bioorganic Chemistry

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OC(CB1)-1: Carbohydrates
OC(CB1)-2: Nucleic acids and Lipids
OC(CB1)-3: Proteins and Enzymes
OC(CB1)-4: Coenzymes and Vitamins

OC(CB1)-1: Carbohydrates **15 Hrs**

Introduction to the importance of Carbohydrates. Types of naturally occuring sugars. Deoxy sugars, aminosugars, branched chain sugars mrthyl ethers and acid derivatives of sugars. Determination of configuration and determination of ring size of D-glucose and D-Fructose. Conformational analysis of monosaccharides. $^4C_1$ and $^1C_4$ conformations of D-glucose. Reactions of six carbon sugars: Ferrier, Hanesian reaction and Ferrier rearrangement. Synthesis of amino, halo and thio sugars. Structure, ring size determination of sucrose and maltose.Conformational structures of sucrose, lactose, maltose, cellobiose and gentobiose. Structure and biological functions of starch, cellulose, glycogenand chitin. Role of sugars in cell to cell recognition, blood groups.

OC(CB1)-2: Nucleic acids & lipids **15 Hrs**

Nucleic acids: Retro synthetic analysis of nucleic acids - Nucleotides, Nucleosides, Nucleotide bases and Sugars. Structure and synthesis of nucleosides and nucleotides. Primary, secondary and tertiary structure of DNA. Types of mRNA,tRNA and rRNA. Replication, transcription and translation. Genetic code. Protein biosynthesis. DNA finger printing.

Lipids: Introduction and classification of lipids. Stereochemical notation in lipids.Chemical synthesis and biosynthesis of phospholipids and glycolipids. Properties of lipid aggregates, micelles, bilayers, liposomes and biological membranes.

OC(CB1)-3: Proteinsand Enzymes15 Hrs

Proteins: Introduction. Peptide bond, classification and nomenclatue of peptides. Amino acid sequence of polypeptides and proteins: terminal residue analysis and partial hydrolysis. Peptide synthesis by solution phase and solid phase synthesis methods. Proteins - Biological importance and classification - Primary, secondary and tertiary structure of proteins.

Enzymes: Definition. Classification based on mode of action.Mechanism of enzyme catalysis - Lock and Key, Induced- Fit and three point contact models. Enzyme selectivity –chemo, regio, diastereo and enantio selectivity – illustration with suitable examples. Factors affecting enzyme catalysis.Enzyme inhibition- reversible and irreversible inhibition. Enzymes in organic synthesis. Immobilised enzymes

OC(CB1)-4: Coenzymes and Vitamins **15 Hrs**

Coenzymes: Introduction. Co-factors -cosubstrates -prosthetic groups.

Classification — Vitamin derived coenzymes and metabolite coenzymes.Structure and biological functionsof coenzyme A, thiamine pyrophosphate (TPP), pyridoxal phosphate (PLP), oxidized and reduced forms of I) nicotinamide adenosine dinucleotide / their phosphates (NAD), NADH, $NADP^+$ NADPH) ii) Flavin adenine nucleotide FAD, $FADH_2$ and iii) Flavin mononucleotide (FMN, $FMNH_2$) lipoic acid, biotin, tetrahydrofolate and ubiquinone. Adenosine triphosphate (ATP)and adenosine diphosphate (ADP), S-adenosyl

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methionine (SAM) and uridine diphosphosugars (UDP-sugars) Mechanism of reactions catalyzed by the above coenzymes.

Vitamins: Introduction, classification and biological importance of vitamins. Structure determination and synthesis of vitamins A, B_1, and B_2. Synthesis of vitamins - B_6, C, E and K. Structure of vitamin B_{12}.

Reference Books:

1. Organic Chemistry Vol.I and Vol.II by I.L.Finar
2. Carbohydrate Chemistry by Barton Volumes
3. Carbohydrate chemistry by G.J.Boons
4. The chemistry of natural products:vol.V - carbohydrates by S.F.Dyke
5. Organic Chemistry by McMurry
6. Nucleic acids in Chemistry and Biology by G M Blackbum MI Gait
7. LehningerPrinciples of Biochemistry by D L Nelson and M MCoxon
8. Outlines of Biochemistry by Conn and Stumpf
9. Enzyme structure and mechanism by Fersht and Freeman
10. Enzymes for green organic synthesis by V.K.Ahluwalia
11. Biotransformations in Organic Chemistry by K Faber.
12. Principles of biochemistry by Horton &others.
13. Bioorganic chemistry - A chemical approach to enzyme action by Herman Dugasand Christopher Penney.
14. Concepts in Biotechnology by D.Balasubramanian& others
15. Chemistry and physiology of the vitamins by H.R.Rosenberg.

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Elective-3B

Paper-III CH (OC)303T (CB2): Forensic Chemistry & Toxicology

OC(CB2)-5: Forensic chemistry- I
OC(CB2)-6: Forensic chemistry- II
OC(CB2)-7: Forensic Toxicology-I
OC(CB2)-8: Forensic Toxicology-II

OC(CB2)-5: Forensic chemistry-I 15 Hrs

Forensic Chemistry - Introduction - Types of cases / exhibits - Preliminary screening - presumptive tests (colour and spot tests) - Examinations procedures involving standard methodsand instrumental techniques

Qualitative and quantitative forensic analysis of inorganic and organic material - Chemical fertilizers (N,P,K) _ Insecticides (Endosulfan, Malathion, Carbaryl) - Metallurgical analysis (Fe, Cu, Zn, Au, Ag) – Natural products (tobacco, tea, sugars, rubber) – Industrial chemicals - Sulphuric, Nitric and Hydrochloric acids, Sodium, Potassium hydroxide, Ammonium nitrate, Potassium chlorate, Organic solvents like Methanol, Ethanol, Acetone, Chloroform and Ether Organic chemicals like Acetanilide, P- Aminophenol, and Nitrobenzene etc. with reference to forensic work.

OC(CB2)-6: Forensic chemistry-II 15 Hrs

Examination of petroleum products - Distillation and fractionation - various fractions and theircommercial uses - Standard method of analysis of petroleum products – Analysis of petroleumproducts for adulteration and arson residues. Chemistry of fire - Investigation and evaluation of fires – Causes of fire - Analysis of arsonresidues by conventional and instrumental methods. Analysis of trace evidence - Cosmetics, Dyes, Trap related evidence materials, Paints, Pigments,Fibres, Oils fats, Greases, Industrial dusts, Chemicals and Plant materials.

OC(CB2)-7: Forensic Toxicology-I15 Hrs

Toxicology- Introduction- History- Scope- Areas of Toxicology- Role of forensic toxicologist- Poisons- Classification of poisons- Types of poisoning- Sample collection and preservation oftoxicological exhibits in fatal and survival cases- Storage of samples- Signs and symptoms ofpoisoning- Toxicological investigation/examination of poisoned death- Interpretationoftoxicologicaldata- Courtroom testimony in toxicological cases.Case Histories.

OC(CB2)-8: Forensic Toxicology-II 15 Hrs

Principles of Toxicology- Introduction – Pharmacokinetics - Methods of transportation oftoxicant- Absorption- Distribution- Storage of toxicants- Redistribution - Metabolism- Oxidation

– Reduction – Hydrolysis – Conjugation - Excretion- Other routes of elimination-Toxicokinetics- one and two compartmental model – Toxicodynamics- Spectrum of undesired(toxic) effects- Interaction of chemicals- Tolerance- Dose response relationship- Developmentaland reproductive toxicity- Mutagenicity- Toxicity testing.

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Recommended books:

1. James, S. H. and Nordby, J. J.: Forensic Science: An Introduction to Scientific and Investigative Techniques, 2003.
2. Saferstein, R: Criminalistics - An Introduction to Forensic Science, Prentice Hall, 1995.
3. Sarkar, S: Fuels and Combustion, Orient Longman, 1990
4. Verma, R. M: Analytical Chemistry – Theory and Practice, CBS Pub., 1994
5. Svehla, G. Ed.: Vogel's Qualitative Inorganic Analysis, Longman, 1998.
6. Bassett: Vogel's Text Book of Quantitative Inorganic Analysis, Longman, 1978
7. Vogel, A. I: Text Book of Practical Organic Chemistry including Qualitative OrganicAnalysis, ELBS, 1971.
8. Narayanan, T. V: Modern Techniques of Bomb Detection and Disposal, R. A. Security System, 1995.
9. Almirall, J. R. and Furton, K. G: Analysis and Interpretation of Fire Scene Evidence, CRC Press, 2004.
10. Bogusz, M. J: Handbook of Analytical Separations : Vol. 2 ,Forensic Science, Elsevier, 2000.
11. Bureau of Indian Standards: Specifications and Methods of Analysis for Petroleum Products.
12. Wilson and Wilson's Comprehensive Analytical Chemistry Volumes
13. Standard Methods of Chemical Analysiss
14. AOAC: Official Methods of Analysis
15. Daeid, N.N.: Fire Investigation: Theory and Practice, Taylor and Francis, 2003
16. Klaassen, C. D.,:Casarett and Doull's Toxicology: The Basic Science of Poisons, 5thed, McGraw-Hill, 1995.
17. Moffat, A.C. : Osselton, D. M. Widdop, B. : Clarke's Analysis of Drugs and Poisons in Pharmaceuticals, body fluids and postmortem material, 3rd ed., Pharmaceutical Press2004.
18. Bogusz, M. J.,: Hand Book of Analytical Separations, Vol. 2: Forensic Science, 1st ed., Elsevier Science ,2000.
19. Siegel, J.A., Saukko, P. J., Knupfer, G.,: Encyclopedia of Forensic Sciences (Vol3), Academic Press, 2000.
20. Paranjape, H.M., Bothara, G.K., Jain, M.M.: Fundamentals of Pharmacology, 1st ed.,Nirali Prakashan,1990.
21. Budhiraja, R.D.: Elementary Pharmacology and Toxicology, Popular Prakashan, 2nd ed., 1999.
22. Laboratory procedure Manual, Forensic Toxicology: DFS, 2005
23. Cravey, R.H; Baselt, R.C.: Introduction to Forensic Toxicology , Biochemical Publications, Davis, C.A. (1981)
24. Stolmen, A.; Progress in Chemical Toxicology: Academic Press, New York (1963)
25. Modi, Jaisingh, P.; Textbook of Medical Jurisprudence& Toxicology, M.M. TripathiPublication (2001)
26. Eckert; An Introduction to Forensic Science, CRC Press

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Elective-4A

Paper-IV CH (OC) 304T (CB3): Green chemistry and Organic materials

OC (CB3) -9: Principles of Green chemistry
OC (CB3) -10: Green Synthesis
OC (CB3) -11: Organic nanomaterials
OC (CB3) -12: Supramolecular chemistry

OC (CB3)-9: Principles of Green Chemistry **15 Hrs**

Green chemistry: Introduction

Principles of Green Chemistry: Designing a Green Synthesis using these principles; Prevention of Waste/by-products; maximum incorporation of the starting materials used in the synthesis into the final products (Atom Economy); prevention/minimization of hazardous/toxic products; designing safer chemicals ; selection of appropriate auxiliary substances - green solvents, ionic liquids and solvent-free synthesis: energy requirements for reactions - use of microwaves, ultrasonic energy in organic synthesis; prevention of unnecessary derivatization – careful use of protecting groups; use of catalytic reagents in preference to stoichiometric reagents; designing of biodegradable products; prevention of chemical accidents; strengthening/development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes.

OC (CB3) -10: Green Synthesis **15Hrs**

i)Microwave Assisted Organic Synthesis (MAOS): introduction, benefits and limitations

a) Microwave assisted reactions in organic solvents: Esterification, Fries rearrangement, Claisen rearrangement and Diels- Alder reaction.

b)Microwave assisted Solvent-free reactions: Deacetylation, saponification of esters, alkylation of reactive methylene compounds and synthesis of nitriles from aldehydes.

ii)Ultrasound Assisted Organic Synthesis: introduction, applications of ultrasound-Cannizaro reaction, Reformatsky reaction and Strecker synthesis.

iii) Organic Synthesis in Green Solvents: introduction

a) Aqueous Phase Reactions: Diels-Alder Reaction, Heck reaction, Hoffmann elimination, Claisen-Schmidt condensation hydrolysis and diydroxylationreactions.

b)Organic Synthesis using Ionic liquids: Introduction, applications-Beckmann rearrangement Suzuki Cross-Coupling Reaction and Diels- Alder reaction.

iv) Green Catalysts in organic synthesis: introduction

a) Phase Transfer Catalysts in Organic Synthesis: Introduction, Williamson ether synthesis and Wittig reaction

b) Biocatalysts in Organic Synthesis: Biochemical (microbial) oxidations and reductions.

OC (CB3) -11: Organic Nanomaterials **15Hrs**

Introduction:The 'top-down' approach, the 'bottom-up' approach and Nanomanipulation.

Molecular Devices: Photochemical devices, Liquid crystals, Molecular wires, Rectifiers, Molecular switches and Molecular Muscles.

New Carbon family: Types of Fullerenes, Types of Carbon nanotubes (Zig-Zag, Armchair and Chiral), Graphenes. Growth, Chemical Synthesis and optoelectronic properties of Fullerenes, CNTs (Zig Zag, Armchair and Chiral), singlewalled CNTs (SWCNTs) and multi walled MWCNTs)and Graphenes.

Structures of aromatics belts, nano car and molecular machines.

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Optoelectronic molecules: OLEDs, Organic Solar Cells (Basic OLED mechanism and structures)

Natural Benzheterazoles and their synthetic modifications as optoelectronic molecules.

OC (CB3) -12: Supramolecular Chemistry 15Hrs

I**ntroduction**: Supramolecular interactions (ion-ion, ion-dipole, H-bonding, cation-π, anion-π, π-π and Van der Walls interactions),Ionophore and molecular receptors.

Host-Guest Chemistry: Lock and key anology, Structures and applications of Cryptands,Spherands, Calixerenes, Cyclodextrins, Cyclophanes, Carcerands and hemicarcirands.

Self-assembly: Ladder, polygons, helices, rotaxanes, catanenes, Molecular necklace, dendrimers, self-assembly capsules their synthesis, properties and applications.

Enantioselective molecular recognition: Cyclodextrins, Crown ethers with chiral frame work, Chiral receptor from Kemp's triacid. Chiral receptors for tartaric acid.

Recommended books:

1.P.T. Anastes & J.K. Warmer: Oxford Green Chemistry- Theory and Practical, University Press (1998).

2. A.S. Matlack: Introduction to Green Chemistry, Marcel Deckkar, (2001).

3. M.C. Cann & M.E. Connely: Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).

4. M.A. Ryan & M. Tinnesand, Introduction to Green Chemistry, American Chemical Society, Washington (2002).

5. V.K. Ahluwalia & M.R. Kidwai: New Trends in Green Chemistry, Anamalaya Publishers

6. Enantioselective organocatalysis, Peter I Dallco, Willey-VCH

7. Core Concepts in Supramolecular Chemistry and Nanochemistry by Jonathan W. Steed, David R. Turner and Karl J. Wallace; John-Wiley and Sons Publications

9. Supramolecular Chemistry by Jonathan W. Steed and Jerry L. Atwood, John-Wiley and Sons Publications

10. Supramolecular Chemistry-Concepts and Perspectives by J M. Lehn; Wiley-VCH (1995) Publications

11. Supramolecular Chemistry by P. D. Beer, P. A. Gale and D. K. Smith; Oxford University Press (1999)

12. Stereochemistry of organic compounds -Principles & Applications by D Nasipuri

13. Nanochemistry by G.B. Sergeev; Elsevier

14. Nanochemistry: A chemical approach to nano materials , G.A. Ozin& A.C. Arsenault; RSC publishers.

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Elective-4B

Paper-IV CH (OC) 304T (CB4): Pesticides

OC(CB4)- 13:Introduction to pesticides
OC(CB4)- 14: Synthetic insecticides
OC(CB4)- 15:Natural insecticides& herbicides
OC(CB4)- 16:Fungicides, and Rodenticides

OC (CB4)-13: Introduction to pesticides **15 Hrs**

i) Defination ,Classification and importance of pesticides

ii) Pest control: Different methods –chemical – insecticides, fungicides, herbicides, rodenticides, fumigants, chitin synthesis inhibitors and insect repellents.

a) Biological–pheremones: Definition and classification, synthesis of Disparlure, Exobrevicomin, Endobrevicomin, frontalin and grandiso pheromones, synthetic sex attractants.

b) Insect juvenile hormones: JH-A, JH-B,Synthesis of juvabione. Structural formula and importance of methopren.

c) Moultingharmones-structural formulae and mode of action of ecdysones

d) Antibiotics and secondary metabolites of microbial origin as insecticides and fungicides in agricultiure. Structural formula and importance of Blasticidin-S, Kasugamycin, Avermectin-B, Invermectin, piercidins and phytoalexins.

iii) Environmental pollution from pesticides.iv) Integrated pest management.

v) Pesticide formulations: Dusts, Granules, Wettable powders, Emmulsions and Aerosols.

OC (CB4)- 14: Synthetic insecticides **15 Hrs**

i)**Organochlorine insecticides**- synthesis and mode of action of methoxychlor, perthan, Dicofol, Heptachlor, Dieldrin and Endosulfan.

ii) **Organophosphorous insecticides** –synthesis and mode action of Phosphoric acid derivatives, phosdrin, Dichlorophos, parathion, Zolone, Aninphomethyl, TEPP and Sachradan.

iii) **Carbamate insecticides**- synthesis and mode of action of carbamyl, Furadan, Baygon, Aldicarb and Zectron.

iv) Formulation and residue analysis of organochlorine, organophophorous and carbamate insecticides.

OC (CB4)- 15: Natural insecticidesand herbicides15 Hrs

i) **Insecticides of palnt origin** –synthesis and importance of pyrethrins (I and II), Rotenone and Nicotine. Main constituents Neem-structural formula of Azadirachtin. Synthesis of polygodial and warbunganol(Antifeedants).

ii)Synthesis of pyrethroids: synthesis of Allethrin, Bioallethrin, Cypermethrin, Fenvalerate, Decemethrin and pyrithrelone.

iii) **Concept of Bioinsecticides** – Bacillus thiuringiensis.

iv) **Concept of pro-insecticides**-structure and mode of action of pro-pheremones and pre-pro-insecticides.

v) **Herbicides** – synthesis,applications and mode of action of the following

a)Aryloxyalkyl carboxylic acid derivative:2,4-D, MCPA,2,4,5-T and 2,4,5-TP.b) Carbamates-propham and chloropham, c)Urea derivatives –Monouron and diuron, d) Aliphatic acids-Dalapon,TCA, e)Aromatic acids -2,3,6-TBA,Dicomba and Amiben, f)Nitrogen heterocyclic dericvatives –Simazine,Atrazine,Amitrole,Maleic hydrazide Diquat and paraquat, g) Phenols-PCP and Dinoseb, h) Benzonitrile compounds

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OC (CB4)-16: Fungicides, and Rodenticides 15 Hrs

i) Fungicides –classification ,synthesis application and mode of action of the following classes: **a**)Carbamatesb)Quinones-chloranil,Dichloneand Benquinoxc)perchloromethylmercaptan derivative –captan,folpet,Difolatan and Mesulfan d) Benzimidazoles-carbendazim, Benomyl and Thiabandazole

ii) Rodenticides, a) Anticoagulents-synthesis and application of warfarin, Coumachlor, Vacor, Coumatetrallyl, Dicoumarol and Bromodiolen.b) Acute poisons- application of pindone,Ratindan,SodiumFluoroacetate ,Barium fluoroacetate,Antu,Tetramine,pindone and castrix.

Referencebooks:

1) Naturally occurring insecticides: M.Jacobson and D.G.Crosby.
2) Insecticides for future:Jacobson
3) Insect juvenile harmone chemistry and action : J.J Mann and M.Beroza
4) Polygodial and warburganal.Terpenoidantifeedants part-II rec,Tran,chin 106
5) Insect antifeedants :S.V.ley&P.L Toogood,chemistry in Britain ,Jan 1990 P.31
6) Synthesis of Insecticides :Metcalf
7) Fungicides-Frear
8) Fungicides-Nene
9) Residue reviews vol.36 : Melnikov
10) Safer insecticides :E.Hodgson
11) Crop protection agents from Nature: leonard G Copping
12) Biofertilizers and Bioinsecticides : A.M.Deshmukh
13) Insecticides and Fungicides :U Sriramulu.
14) Organo chlorine insecticides : persistent organic pollutants :F.Moriary
15) Herbicides :P.C.Kearney&D.D.Kaufnan
16) Analytical Method for pesticides :Z.Weig (Vol III)
17) Pesticide formulations :Van Valkenburg
18) Insecticides :A.S.Tahori
19) Herbicides,fungicides,formulation chemistry-A.S.Tahori
20) Environmental pollution by pesticides :C.A.Edwards
21) Pespticides managements and insecticide resistance :Watson and brown
22) Organo phosphorous pesticides M.eto

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Laboratory courses:

Paper CH (O) 351P: Synthesis of organic molecules, isolation of natural products & TLC

(A) Laboratory synthesis of the following compounds:

Phenyl indole (Fischer indole synthesis), 7-hydroxy-3-methyl flavone (Baker-Venkatraman reaction), 2,5-Dihydroxy acetophenone (Fries reaction), 4- Chlorotoluene from p-toluidine (Sandmeyer reaction), Benzilic acid from benzoin (Benzillic acid rearrangement), Benzpinacol (photochemical reaction), 7-hydroxy coumarin (Pechman synthesis), Photo-dimerization of maleic anhydride, benzophenone (Friedel-Crafts reaction), Benzanilide (Beckmann rearrangement), Vanillyl alcohol from vanillin ($NaBH_4$ reduction), 2- and 4-nitrophenols (nitration and separation by steam distillation), Acridone from Phthalic anhydride.

(B) Isolation of the following natural products:

Caffeine from tea leaves (solvent extraction), Piperine from pepper (Soxhlet extraction), Eucalyptus oil from leaves (steam distillation),Lycopene from tomatoes.

(C) n layer chromatography : Thin layer chromatography: Determination of purity(All the above preparations) , monitoring the progress of chemical reactions (any of the four above preparations), identification of unknown organic compounds by comparing the R_f values of known standards.

Paper CH (O) 352P: Separation and identification of organic compounds & Column chromatography

Separation of two component mixtures by chemical methods and their identification by chemical reactions — separation by using solvent ether, 5 % aqueous sodium bicarbonate, 5% sodium hydroxide and dil hydrochloric acid, checking the purity of the two components by TLC, identification of the compounds by a systematic study of the physical characteristics (mp/bp), extra elements (nitrogen, halogens and sulfur), solubility, functional groups, preparation of crystalline derivatives and identification by referring to literature. A minimum of **09** mixtures should be separated and analyzed by these procedures.

Cannizzaro reaction: 4-Chloro benzaldehyde as substrate and separation of the resulting two component mixture

Separation of three component mixtures by chemical methods. A minimum of two mixtures should be separated and analyzed.

Column chromatography: Separation of a mixture of *ortho* and *para*-nitroanilinesand any one of the two component mixture using silica gel as adsorbent and chloroform as the eluent. The column chromatography should be monitored by TLC.

Recommended Books:

1. Practical organic chemistry by Mann & Saunders
2. Text book of practical organic chemistry by Vogel
3. The systematic identification of organic compounds by Ralph L. Shriner, Christine K. F. Hermann, Terence C. Morrill and David Y. Curtin

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M.Sc. ORGANIC CHEMISTRY SPECIALISATION
IV SEMESTER SYLLABUS
(For the batch admitted during the academic year 2016-2017)

Paper-1 CH (OC) 401T: Drug Design and Drug Discovery
OC-17: Principles of Drug design and drug discovery
OC-18: Lead modification and SAR Studies
OC 19: QSAR studies and computer aided drug design
OC-20: Combinatorial Synthesis

Paper-II CH (OC) 402T: Drug synthesis and mechanism of action
OC-21: Drugs acting on metabolic process, cell wall and specific enzymes
OC-22: Drugs acting on genetic material and immune system
OC-23: Drugs acting on receptors and ion channels
OC-24: Chiral drugs

Elective-3A Paper-III CH (OC)-403T (CB1): Advanced Heterocyclic Chemistry
OC (CB1) 17: Non aromatic heterocyclics& aromaticity
OC (CB1) 18: Five and six membered heterocyclics with two hetero atoms
OC (CB1) 19: Heterocyclics with more than two hetero atoms
OC (CB1) 20: Larger ring and other heterocycles

Elective-3B Paper-III CH (OC)-403T (CB2): Polymers , dyes and Pigments
OC (CB2) 21: Polymers- I
OC (CB2) 22: Polymers- II
OC (CB2) 23: Dyes-I
OC (CB2) 24:Dyes-II and pigments

Elective-4A Paper-IV CH (OC) 404(CB3)T: Advanced Natural Products
OC(CB3)-25: Biosynthesis of natural products
OC(CB3)-26: Structure determination of natural products -I
OC(CB3)-27: Structure determination of natural products-II
OC(CB3)--28: Total stereo selective synthesis of natural products.

Elective-4B Paper-IV CH (OC) 404(CB4)T: Biopharmaceutics and Pharmacodynamics
OC(CB4)-29 : Pharmacokinetics
OC(CB4)-30 : Pharmacodynamics
OC(CB4)-31 : Principles of Therapeutics
OC(CB4)-32: Drug Interactions

Laboratory courses

Paper-VCH (OC) 451P: Spectroscopic identification of organic compounds & practice of chemistry software prgrammes
Paper-VI CH (OC) 452P: Synthesis and analysis of drugs

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M.Sc. CHEMISTRY (ORGANIC CHEMISTRY)
IV SEMESTER SYLLABUS
(For the batch admitted during the academic year 2016 -2017 under the CBCS pattern)

Paper-1 CH(OC) 401T: Drug Design and Drug Discovery

OC-17: Principles of Drug design and drug discovery
OC-18: Lead modification and SAR Studies
OC 19: QSAR studies and computer aided drug design
OC 20: Combinatorial Synthesis

OC- 17: Principles of Drug design and drug discovery **15 Hrs**

Introduction to drug discovery. Folklore drugs, stages involved in drug discovery- disease, drug targets, bioassay. Discovery of a lead- screening of natural products and synthetic compound libraries. Existing drugs as leads (me too drugs). Pharmacokinetics (ADME), pharmacodynamics. Nature of drug – receptor interactions and their theories – Occupancy theory, Induced – fit theory, Macromolecular purturbation theory and Two-state model of receptor activation. Natural products as lead structures in drug discovery – Pharmacophore - structure pruning technique e.g. morphine.Discovery of lead structure from natural hormones and neurotransmitters.Principles of design of agonists (e.g.Salbutamol), antagonists e.g. cimitidine) and enzyme inhibitors (e.g. captopril). Drug discovery without lead – serendipity- Penicillin and Librium as examples. Principles of prodrug design. Introduction to drug patents and Clinical trials.

OC-18: Lead modification and SAR Studies **15 Hrs**

SAR*:* Lead modification strategies, Bioisosterism, variation of alkyl substituents,chain homologation and branching, variation of aromatic substituents,extension of structure, ring expansion and ring contraction, ring variation, variation and position of hetero atoms, ring fusion, simplification of the lead, rigidification of lead.Discovery of oxaminquine, salbutamol, cimitidine and captopril Structure-Activity Relationship studies in sulfa drugs,benzodiazepines, and taxol analogs.

OC-19: QSAR studies and computer aided drug design **15Hrs**

QSAR: Introduction, physicochemical properties - pKa, electronic effects and Hammett constants(σ), lipophilicity constant(π), steric effects and Taft's constant, linear and nonlinear relationship between biological activityLipophilicity Substituent constants. Lipinski rule of five. Hansch analysis, Craig's plot,Topliss scheme, Free Wilson approach, cluster significant analysis. Two case studies (QSAR study on pyranenamine and design of Crizotinib).

Computer aided drug design: Introduction, active site, allosteric binding site,use of grids in docking , rigid docking , flexible docking and induced fit docking of ligands. Basic principles and difference between structure and ligand based drug design, denovo drug design and utility to optimize the lead structure.

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OC-20: Combinatorial Synthesis **15Hrs**

Introduction. Combinatorial approach. Combinatorial libraries, technologies. Solid phase synthesis, types of resins. Linkers. Reactants for solid phased synthesis. Methods of Parallel synthesis: Haughton's tea bag procedure. Automated parallel synthesis. Methods in Mixed combinatorial synthesis: general principles. Furkas mix and split combinatorial synthesis, Structure determination of active compounds-Deconvolution, Methods in deconvolution-recursive deconvolution, tagging and use of decoded sheets. Examples of Combinatorial Chemistry. Planning and designing of combinatorial synthesis, Spider like scaffolds, drug molecules. Automation in Combinatorial chemistry. High throughput screening.

Reference books

1. Burger's medicinal chemistry and drug discovery by Manfred E. Wolf.
2. Introduction to Medicinal chemistry by Patrick.
3. Introduction to drug design by R Silverman
4. Comprehensive medicinal chemistry. Vol 1-5 by Hanzsch.
5. Principles of medicinal chemistry. by William Foye
6. Biochemical approach to medicinal chemistry. by Thomas Nogrady.
7. Pharmaceutical Chemistry and Drug synthesis by Roth and Kleeman
8. Drug design by E.J.Arienes
9. Principles of Medicinal Chemistty Vol I & II by Kadam et al
10. Medicinal chemistry An introduction by Garreth Thomas
11.Organic and Pharmaceutical chemistry By Delgrado
12. Organic Pharmaceutical chemistry By Harikishansingh
13. Medicinal Chemistry By Ashtoshkar
14. Medicinal Chemistry By Chatwal
15. Organic Drug synthesis By Ledneicer Vol 1-6
1 6.Strategies for organic drug synthesis and design By Daniel Ledneicer.
1 7.Top Drugs: Top synthetic routes By John Saunders
I 8.Chirotechnoiogy By Roger A. Sheldon
19. Burger's Medicinal Chemistry and Drug Discovery: Principles and Practices. Vol. 1.
20. Medicinal Chemistry by G. Patricks.
21. Text book of Drug Design and Discovery, Edited by PovlKrogsgaard – Larsen Tommy Liljefors.
22. Structure Based Drug Design of Crizotinib (PF-02341066), a Potent and Selective Dual Inhibitor of Mesenchymal–Epithelial Transition Factor (c-MET) Kinase and Anaplastic Lymphoma Kinase (ALK) Martin P. Edwards, J. Med. Chem., 2011, 54 (18), pp 6342–6363.

http://www.pfizer.com/news/featured_stories/featured_stories_martin_edwards.jsp

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Paper-II CH (OC) 402T: Drug synthesis and mechanism of action

OC-21: Drugs acting on metabolic process, cell wall and specific enzymes
OC-22: Drugs acting on genetic material and immune system
OC-23: Drugs acting on receptors and ion channels
OC-24: Chiral drugs

OC-21: Drugs acting on metabolic process, cell wall and specific enzymes

Basic concepts of mechanism of drug action: Introduction to macromolecular targets, carbohydrates, proteins, lipids and nucleic acids as possible drug targets. Classification of drugs. Enzyme inhibition and its types.

a**)** Drugs acting on metabolic process:

Antifolates –Discovery and mechanism of action of sulphonamides, Synthesis of sulfomethoxazole, sulfodoxine, sulfaguanidine and dapsone.

Diaminopyrimidines -trimethoprim, bacterial resistance to sulfonamides and drug synergism

b**)**Drugs acting on cell wall: Structure of bacterial cell wall, β-Lactam antibiotics – mechanism of action of penicillins and cephalosporins. Synthesis of pencillin-G and cephalosporin-C, cefalexin and cycloserine. Resistance to pencillins, broad spectrum penicillins – cloxacillin, methicillin, ampicillin, amoxicillin and carbenicillin. β-Lactamase inhibitors- Structural formulae and mode of action of clavulanic acid and sulbactum

c)Drugs acting on specific enzymes: H^+/K^+ -ATPase inhibitors- synthesis of Omeprazole and Carbonic anhydrase inhibitors-synthesis of Acetazolamide.

OC-22: Drugs acting on genetic material and immune system

Drugs acting on genetic material:Introduction, classification and mechanism of action.

a) DNA-intercalating agents-Anticancer and antimalarial agents. Structural formulae of Daunomycin, Adriamycin and Amsacrine. Synthesis of Amscarine, Nitracrine, Quinacrine and Chloroquine.

b) DNA- Binding and nicking agents: Antiprotozoal drugs. Synthesis of Metronidazole, Dimetridazole and Tinidazole.

c) DNA-Alkylators: Synthesis of Cyclophosphamide and Bisulphan.

d) DNA-Polymerase inhibitors: Antiviral agents- Synthesis of Acyclovir and AZT.

e) DNA-Topoisomerase inhibitors: Anti bacterial agents.Synthesis of Ciprofloxacin and Norfloxacin. Structural formulae ofloxacin and Lomefloxacin.

f) Inhibitors of transcribing enzymes: Anti-TB and antileprosy agents-structural formulae of Rifamycins and partial synthesis of Rifampicin.

g) Drugs interfering with translation process: Antibacterial drugs- Structural formulae of Erythromycin, 5-Oxytetracycline and Streptomycin. Synthesis of Chloromycetin

Drugs acting on immune system: Introduction to immune system. Immunosupressing agent-structural formula of Cyclosporin. Immunoenhancers-use of vaccines and strucrural formula of levamisol.

OC-23: Drugs acting on receptors and ion channels

Introduction to nervous system: structure of neuron, nerve transmission. Definition and examples of agonist, antagonist, neurotransmitters and receptors.

Drugs acting on receptors:

a)Adrenergic receptors - Introduction and classification. α-Adrenergic-receptor agonists and antagonists- Synthesis and biological activity of Nor-adrenaline, Methyl L dopa and Tetrazosin.

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β-Adrenergic-receptor - agonists and antagonists – Synthesis and pharmacological activity of Salbutamol, Tetrabutalin, Propranolol and Atenolol.

b) Cholinergic-receptors: Introduction and classification.Cholinergic-receptor agonists and antagonists- Structural formulae of Nicotine, Atropine and Tubocurarine. Synthesis of Acetyl choline and Succinyl choline

c) Dopamine receptors: Introduction and classification.Dopamine- receptoragonists and antagonists- Biosynthesis of Dopamine. Synthesis of L-Dopa and Chlorpromazine.

d)Serotonin receptors: Introduction and classification.Serotonin receptoragonists and antagonists-synthesis and pharmacological activity of Serotonin and Metoclopramide.

e)Histamine receptors:Introduction and classification.Histamine receptor agonists and antagonists-synthesis and biological action of Histamine, Chloropheneramine, and Ranitidine.

f) Hormones and their receptors: Introduction to estrogen receptors, Structural formulae of Tamoxifen

Drugs acting on ion channels: Introduction to ion channels, drugs acting on Ca^{2+}, Na^{+} and Cl^{-} channels and their mode of action. Structural formulae of Tetracaine and synthesis and of Nifedipine, Diltiazem, Tetracine and 4-Aminopyridine.

OC-24: Chiral drugs

Introduction to chiral drugs. Three-point contact model, Eutomer, Distomer and eudesmic ratio. Pfeiffer's rule. Role of chirality on biological activity: Distomers – a) with no side effects b)with undesirable side effects c) both isomers having independent therapeutic value d)combination products having therapeutic advantages e) metabolic chirality inversion.

Synthesis and pharmacological activity of S-Ibuprofen, S- Metaprolol, Ininavir sulfate, Levocetrazine, 2S-Verapamil, S,S-Ethambutol , (+)Lomefloxacin, Fluvastatin, Dextropropoxyphen, (+)Ephedrine, (+)Griseofulvin, Dexormaplatin, R-Indacrinone, Nateglinide, Oxybutynin hydrochloride, S,S- Captopril and S,S,S- Enalaprilate.

Reference Books:

1. Burger's medicinal chemistry and drug discovery. By Manfred B. Wolf.
2. Introduction to Medicinal chemistry. By Graham Patrick.
3. Introduction to drug design. By R.B.Silverman
4. Comprehensive medicinal chemistry. Vol 1-5 by Hanzsch.
5. Principles of medicinal chemistry. By William O. Foyeetal.
6. Biochemical approach to medicinal chemistry. By Thomas Nogrady.
7. Pharmaceutical Chemistry and Drug synthesis By Roth and Kleeman
8. Drug design By E.J. Arienes
9. Principles of Medicinal Chemistry. Vols.1 & 2 By Kadam etal
10. Medicinal chemistry An introduction By Gareth Thomas
11. Wilson and Gisvold,s text book of Organic, Medicinal and Pharmaceutical chemistry By J.N.Delgado and W.A.Remers.
12. Organic Pharmaceutical chemistry By Harikishansingh.
13. Medicinal Chemistry By Ashutoshkar
14. Medicinal Chemistry By G.Chatwal
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Elective-3A

Paper-III CH (OC)-403T (CB1): Advanced Heterocyclic Chemistry

OC (CB1) 17: Non aromatic heterocyclics& aromaticity

OC (CB1) 18: Five and six membered heterocyclics with two hetero atoms

OC (CB1) 19: Heterocyclics with more than two hetero atoms

OC (CB1) 20: Larger ring and other heterocycles

OC (CB1) 17: Nonaromatic heterocyclics& Aromaticity15 Hrs

Different types of strains, interactions and conformational aspects of nonaromatic heterocycles. Synthesis, reactivity and importance of the following ring systems. Azirines, Aziridines, Oxiranes, Thiiranes, Diazirenes, Diaziridines, Oxaziridines, Azetidines, Oxetanesandthietanes

Aromaticity: Introduction, Aromatic and anti aromatic compounds. Criteria for aromaticity. Huckel's 4n+2 electron rule for benzene and non benzenoid aromatic compounds. Eg. Cyclopropenium ion, cyclopentadienyl ion, cycloheptatrienium ion, azulene and annulenes.

OC (CB1) 18: Five and six membered heterocyclics with two hetero atoms 15 Hrs

Synthesis, reactivity, aromatic character and importance of the following heterocycles: Pyrazole, Imidazole, Oxazole, Thiazole, Isoxazole, Isothiazole, Pyridazine, Pyrimidine. Pyrazine, Oxazine, thiazine, benzimidazole, benzoxazole and benzthiazole.

OC (CB1) 19: Heterocyclics with more than two hetero atoms 15 Hrs

Synthesis, reactivity, aromatic character and importance of the following Heterocycles: 1,2,3-triazoies,1,2,4-triazoles, Tetrazoles, 1,2,4-oxadiazole, 1 ,3,4-oxadiazole, 1,2,5- oxadiazole, 1,2,3-thiadiazoles, 1,3,4- thiadiazoles, 1,2,5- thiadiazoles, 1,2,3-triazine, 1,2,4- triazine, 1,3,5-triazine, tetrazines. Synthesis and importance of purines and pteridines. Syntheis of Caffeine, theobromine and theophylline.

OC (CB1) 20: Larger ring and other Heterocycles 15 Hrs

Synthesis, structure, stability and reactivity ofAzepines, Oxepines and Thiepines. Synthesis of Diazepines rearrangements of 1,2 - diazepines. Synthesis of Benzoazepines, Benzodiazepines, Benzooxepines, Benzothiepines, Azocines and Azonines. Synthesis of selenophenes, Tellerophenes,Phospholesand Boroles.

Recommended Books:

1. Heterocyclic Chemistry, T.Gilchrist
2. An introduction to the Chemistry of heterocyclic compounds, R.M.Acheson
3. Heterocyclic Chemistry, J.A.Joule&K.Mills
4. Principles of Modern Heterocyclie Chemistry, A.Paquette
5. Heterocyclic Chemistry, J,A.Joule& Smith
6. Handbook of Heterocyclic Chemistry, A.R.Katritzky
7. The aromaticity III level, units 17-19 British open university volumes
8. Aromatic character and aromaticity by G.M.Badger
9. Non-benzenoid aromatic compounds by D.Ginsberg
10. Nonbenzenoid compounds by Lloy

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Elective-3B

Paper-III CH (OC)-403T (CB2): Organic Polymers, Dyesand Pigments

OC (CB2) 21: Polymers- I
OC (CB2) 22: Polymers- II
OC (CB2) 23: Dyes-I
OC (CB2) 24:Dyes-II and pigments

OC (CB2) 21:Organic Polymers - I15 Hrs

Introduction, Classification of Polymers – according to origin, structure, intermolecular interactions. Types of polymerization – addition, condensation, radical, ionic and coplymerization with mechanism, Ziegler-Natta polymerization with mechanism. Stereochemistry of polymers, Plasticity – types of plastics. Molecular mass of polymers. Resins and plastics – Polystyrene and styrene copolymers, poly(vinyl chloride/vinyl acetate)and related polymers, acrylic polymers, polyesters, phenol-formaldehyde polymers, polyurethanes and epoxide polymers with examples. Natural and synthetic rubbers.

OC (CB2) 22: Organic Polymers - II 15 Hrs

a) Functional polymers :

i) Electrically conducting polymers: Introduction, basic principles. Brief description of polyanilines, polypyrroles, polyacetylenes, polythiophenes and their applications.

ii) Photoconductive polymers: Liquid crystal polymers, smectoc, nematicamd cholesteric structures, ion-exchange polymers – cationic, anionic exchange polymers and their uses.

iii) Smart materials: Uses in sensing device and communication networks.

iv)Biodegradable polymers: Definition, classification. Brief description polyhydroxyalkanoates, polycaprolactones, polyactic, polyvinyl alcohol and their applications.

b) Membranes: Filtration, micro, ultra, nano filtration. Separation of gases-Permeselectivity and gas permeability representative polymers. Liquid separation-dialysis, electroosmosis and reverse osmosis.

c) Fire retarding polymers and photonic polymers.

Polymers in biomedical application, artificial organs and controlled drug delivery.

OC (CB2) 23: Dyes – I 15 Hrs

Synthetic and Natural dyes

Introduction, nomenclature and classification of synthetic dyes. Color and constitution - chromospheres and auxochromes with suitable examples, Witt's theory, Armstrong's theory, Baeyer's theory, Nietzki's theory, Waston's theory, Modern theories, Valence Bond Theory and Molecular orbital theory. Chemistry and synthesis of triphenyl methane dyes[malachite green, rosaniline, para aniline blue, crystal violet methyl violet, hydroxytriphenyl methane dyes, Aurin, chrome violet], Azo dyes - types of azo dyes, synthesis of acidic and basic azo dyes, mono azo, di azo, tri azo and poly azo dyes. Chemistry and synthesis of cyanine dyes. Natural dyes – structure determination and synthesis of alizarine, Quinazarin and Indigo.

OC (CB2) 24:Dyes–II and Pigments 15 Hrs

a)Introduction to Fluorescence dyes

Interaction of organic molecules with electromagnetic radiation. Energy diagram. Activation and deactivation of organic molecules by light. Fluorescence and delayed fluorescence. Effect of molecular structure on fluorescence. General properties of fluorescent dyes and their requirements. Triplet-triplet absorption of organic molecules. Fluorescent quantum

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yields and factors affecting them. Synthesis of Fluorescent aromatic hydrocarbons. and Fluorescent heteroaromatic compounds.

b) **Introduction to laser dyes**. Synthesis of Oligophenylenes. Oxazoles and benzoxzoles. Stilbenoid compoundsCoumarin laser dyes, Rhodamine laser dyes.

c) **Pigments:** Introduction, Structures of Porphyrins , Bile pigments. Synthesis of Haemin and Chlorophyll. Synthetic pigments – preparation of phthalocyanines.

ReferenceBooks

1. Organic polymer chemistry by K.J.Sanders
2. Polymer syntheses, Vol.I by S.R.Sandler and W.Karo
3. The elements of Polymer Science and Engineering by A.Rudin
4. Principles of Polymer Chemistry by A.Ravve
5. Polymer Science by V.R.Gowariker , N.V.Viswanathan and J.Sreedhar
6. Polymer Chemistry by C.E.Carraher , Jr.
7. A text book of polymers, Vol. I,II,III, M.S. Bhatnagar , S. Chand
8. Polymer Chemistry, B. Vollmert
9. Textbook of Polymer Science, F. W. Billmeyer Jr, John Wiley & sons
10. Organic Chemistry , Vol.1,2 by I.L.Finar
11. Color and constitution of organic molecules by J.Griffiths
12. Functional Dyes, Elsevier BV 2006,,,,,,S H.KIM
13. Colorants for non-textile Applications, Elsevier BV 2000 …H S Freeman and A T Peters
14. Industrial Dyes-Chemistry, Properties, Applications. WILEY-VCH Verlag, 2003 Klaus Hunger
15. Introduction to Fluorescence Sensing, Springer 2009, by A P Demchenko
16. Natural Dyes and their Applications in Textiles by M. L. Gulrajani, IIT Delhi
17. Handbook on Natural Dyes for Industrial Applications by P. S. Vankar, National Institute of Industrial Research
18. Steroelectronic Effects in Organic Chemistry by Pierre Deslongchams, Pergamon Press
19. Chemistry and Biochemistry of plant pigments, Vol. 2, by T.W.Goodwin
20. Contemporary Polymer Chemistry, H. R. Alcock& F. W. Lambe, Prentice Hall
21. Materials scince and engineering an introduction by William D Callister, Jr. Wiley Publishers

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Elective-4A(ID Paper)
Paper-IVCH (OC) 404(CB3)T: Advanced Natural Products

OC(CB3)-25: Biosynthesis of natural products
OC(CB3)-26: Structure determination of natural products-I
OC(CB3)--27: Structure determination of natural products-II
OC(CB3)--28: Total stereo selective synthesis of natural products.

OC(CB3)-25: Biosynthesis of natural products 15 Hrs

Biosynthesis of secondary metabolites: Introduction,Difference between Laboratory synthesis and biosynthesis. Methods for determination of biosynthetic mechanism. Isolation and identification of Biosynthetic precursors, Feeding experiments – use of radioisotopes Measurement of incorporation – absolute incorporation, specific incorporation. Identification of the position of labels in labeled natural products by chemical degradation and spectral methods. Major biosynthetic pathways: 1) Acetate-Malonate pathway: Biosynthesis of aromatic compounds, 2) Shikimic acid pathway ; Biosynthesis of essential amino acids – phenylalanine, tyrosine and tryptophan, carboxylic acid derivatives, flavonoids and morphine alkaloids. 3) Mevalonic acid pathway : Biosynthesis of terpenes – mono,sesqui, di, tri (β-amyrin) and carotenoids, steroids – cholesterol.

OC(CB3)-26:Structure determination of natural products-I15Hrs

Determination of structure and stereochemistry of morphine, reserpine, abietic acid, cholesterol and rotenone.

OC(CB3)-27: Structure determination of natural products-II 15 Hrs

Spectroscopic techniques IR, UV, ^{1}Hnmr, ^{13}Cnmr, COSY, HETEROCOSY, NOESY, 2D-INADEQUATE and MS in the structure elucidations of natural products, Examples, flavones, biflavones, flavanones, isoflavones, coumarins, quinolines, isoquinolines.

Study of the following solved problems: Mass, IR, ^{1}H, ^{13}C NMR, HOMOCOSY, HECTOR, DEPT, 2D-INADEQUATE and NOE of Geraniol, INEPT of **menthol**, APT of **apparicine**,

Heteronuclear 2D-J resolved spectrum of **stricticine**,NOESY of **buxaquamarine**, HETEROCOSY of **strictanol**, 2D-INADEQUATE of **α-picoline** and **β-methyl tetrahydran furan**.

OC(CB3)-28: Total stereoselective synthesis of natural products. 15 Hrs

Nicalou's synthesis of Dynemicin A , Corey's synthesis of prostaglandins (E2, F2α) and paeoriflorin, Sharpless synthesis of L-hexoses, Nicolaous synthesis of taxol, Danishefsky synthesis of indolizomycin, Takasago synthesis of menthol, Hoffmann-LaRoche synthesis of Biotin.

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Reference books:

1. Textbook of organic chemistry, Vol II by I L Finar
2. Chemistry of natural products, Vol 12, by Atta-Ur-Rahman
3. An introduction to the chemistry of terpenoids and steroids, by William templeton
4. Systematic identification of flavonoid compounds by Mabry &Markham
5. Steroids by Fieser arid Fieser
6. Alkaloids by Manske
7. Alkaloids by Bentley
8. The chemistry of terpenes by A Pinder
9. The terpenes by Simenson
10. Terpenoids by Mayo
11. Alkaloids by Pelletier
12. Total synthesis of Natural Products by Apsimon Vol 1-5
13. Biosynthesis by Geismann
14. Principles of organic synthesis 3rd Ed. R O C Norman and J M Coxen
15. One and two dimensional nmr spectroscopy by Atta Ur Rahman
16. Classics in total synthesis K C Nicolaou and E J Sorenson
17. Spectrometric identification of organic compounds by Silverstein and Webster

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Elective-4B(ID Paper)
Paper-IV CH (OC) 404(CB4)T: Biopharmaceutics and Pharmacodynamics

OC(CB4)-29 : Pharmacokinetics
OC(CB4)-30 : Pharmacodynamics
OC(CB4)-31 : Principles of Therapeutics
OC(CB4)-32: Drug Interactions

OC(CB4)-29: Pharmacokinetics.
Introduction and importance of ADME studies of drugs. Routes of administration . i)Absorption: Definition, absorption of drugs across the membranes. Physico chemical factors affecting the drug absorption (emphasis on pH partition hypothesis and Drug Dissolution). Methods of determination of drug absorption. Bioavailability. ii)Distribution: Apparent volume of drug distribution. Factors affecting distribution, plasma protein binding. iii) Metabolism: Sites of drug metabolism, metabolic rate constant, bioactivation and biotransformation of drugs (phase I and phase II reactions) iv)Elimination: Types of elimination and overall apparent elimination rate constant and half-life, concept of clearance.

OC(CB4)-29: **Pharmacodynamics.**
Introduction, targets for drug action, receptor concept. Pharmacological binding terms. Two-statereceptor model, receptor families- structure and signal transduction mechanisms- channel linked proteins, gating mechanism, G-protein coupled receptors, G-protein and their role, Targets for G-proteins, Kinase linked receptors, receptors that regulate gene transcription. Theories of concentration -response relationship, dose-response curves.

OC(CB4)-30: **Principles of Therapeutics**
Plasma Drug concentration vs Time profile,Definition and explanation of various terms: MEC, MSC, MTC, AUC(graph). Peak plasma concentration, time of peak concentration. Therapeutic range. Steady state concentration, onset of action, onset of time, duration of action, intensity of action. LD50, ED50. Therapeutic objective. Dosage regimen, Design of dosage regimes: Dose size, dosing frequency, drug accumulation during multiple dosing, time to reach steady-state during multiple dosing, average concentration and body content on multiple dosing to steady state, loading dose, maintenance dose, maintenance of drug within the therapeutic range, design of dosage regimen from plama concentration. Kinetics of fixed dose, fixed time interval regimes. Modification to dosage regime: Dosing of drugs in obese patients, dosing of drugs in Neonates, infants & children, dosing of drugs in geriatrics (elderly), dosing of drugs in Hepatic disease, dosing of drugs in renal disease.

OC(CB4)-31: Drug Interactions.
Introduction, classification, Mechanisms of drug interactions.– pharmacokinetic interactions(alteration of gastrointestinal absorption, compexation and adsorption, alteration of distribution, alteration of metabolism and alteration of excretion) & pharmacodynamic interactions (antagonistic effects, synergistic effects, alteration of electrolyte levels, interactions involving adrenergic system, alteration of receptor site interaction and antibiotic combinations). Influence of alcohol(Anti biotics, Anti coagulants, Anti histamines, Anti psychotic drugs, sedatives and Hypnotics), smoking(Theophylline, Diazepam, a Tri cyclic antidepressants), food (Bronchodaliators, Diuretics, ACE Inhibitors, Anti coagulants,Tetracyclines) on drug action.

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Reference books:

1. Pharacokinetics. By Shobha Rani
2. Elements of Pharmacology. By Gandhi,Desani& Goyal.
3. Goodmann&Gilmann's " The pharmacological basis of therapeutics. By Gilman &Rali.
4. Pharmacology. By Rang.
5. Biopharmaceutics and pharmacokinetics By Brahmanikar
6. Pharmacology By Lippincot
7. Modern Pharmacology with Clinical Applications. By R.Craig.
8. Compehensive pharmacy review by Leon Shargel
9. Hospital and clinical pharmacy
10. Burger's medicinal chemistry and drug discovery. By Manfred E. Wolf.
11. Introduction to Medicinal chemistry. By Patrick.
12. Comprehensive medicinal chemistry. Vol 1-5 By Hanzsch.
13. Principles of medicinal chemistry. By William Foye
14. Biochemical approach to medicinal chemistry. By Thomas Nogrady.

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Laboratory courses

Paper CH (OC) 451P: Spectroscopic identification of organic compounds & practice of chemistry software prgrammes

1. Identification of unknown organic compounds by interpretation of IR, UV, ^{1}H -NMR, ^{13}C NMR, and mass spectral data(two examples with 2D-NMR). A minimum of 30 representative examples should be studied.
2. **Chemistry software programmes:** Chem Draw, analysis of IR and NMR using ACD/Id NMR processor. EXCEL: Drawing graphs, Molecular docking.

Paper CH (OC) 452P: Synthesis and analysis of drugs

(A) Laboratory Synthesis of the following drugs:

Paracetamol, Phenytoin, Benzocaine, 6-Methyluracil, Chloritone,FIuorescien, Aminobenzene sulfonamide, antipyrineand phenothiazine

(B)* Estimation of the following drugs*:

Aspirin (titrimetry), Ibuprofen (titrimetry), Analgin (titrimetry), Chloride in Ringer's lactate (argentometry), ascorbic acid {titrimetry, Iodometry and Cerimetry), colorimetry}, Isoniazid(Iodometry), Riboflavin(colorimetry),Zn ions in Bactracin Zinc, Ca^{+2} ions in Calcium gluconate injection(complexometry), Riboflavin (UV-Visible Spectrophotometer).

Reference books:

1. Practical organic chemistry by Mann & Saunders
2. Text book of practical organic chemistry by Vogel
3. The systematic identification of organic compounds by Shriner et.al
4. Analytical chemistry by G N David Krupadanam et.al
5. Advanced practical medicinal chemistry by Ashutoshkar
6. Pharmaceutical drug analysis by Ashutoshkar
7. Quantitative analysis of drugs in pharmaceutical formulations by P D Sethi
8. Practical pharmaceutical chemistry part-1 and part-2 by A H Beekett and J B Stenlake
9. Spectroscopic identification of organic compounds by R M Silverstein and F X Webster

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BOS Meeting Resolutions-2018-19, Department of Chemistry

The following resolutions were taken in the meeting.

1. Resolved to adopt the syllabus prescribed by Osmania University for M.Sc. I to VI Semesters without making any changes for the Academic year 2018-19 where as for B.Sc.(I to VI semesters) slight changes have been done.
2. The division and adoption of syllabus was discussed and decided to split the IV-units of 12 chapters in I to VI Semesters of B.Sc.
3. Resolved to adopt the same syllabus prescribed by the Osmania University for Skill Enhancement Course [SEC-I, SEC-II, SEC-III & SEC-IV] in the III, IV, V and VI semesters respectively and 2 credits are allotted for each SEC. In the V and VI semester the ~~General~~ Generic Elective papers [GE-I and GE-II] syllabus is same as Osmania University prescribed.
4. The pattern of evolution and examination was discussed with two internals in the each semester and average of two would be taken for the semester marks computation. The internals would be of the 30 marks and the semester exams would be 70 marks. The Skill Enhancement Course would be for 40 marks for External exam and 10 marks for Internal Assessment.
5. The practical examinations would be conducted at the end of the each semester

6. List of reference and prescribed books should mention for prescribing the students as recommended by Osmania University with few additions.
7. Question banks would be made for the students for the unit.
8. List of panel of examiner were enlisted for the purpose of evaluation of examinations.
9. Resolved to adopt the same syllabus prescribed by the Osmania University for Skill Enhancement Course [SEC-I, SEC-II, SEC-III & SEC-IV] in the III, IV, V and VI semesters respectively. In the V and VI semester the ~~General~~ Generic Elective papers [GE-I and GE-II] syllabus is same as Osmania University prescribed.

Board of studies
Chairman BOs

Members

1. Ch. Sarala Devi
2. P. Leela
3. P. Veena 20.7.2018
4.
5.
6.
7.
8.
9. Shravani

B.Sc. III year CHEMISTRY SEMESTER WISE SYLLABUS SEMESTER VI
Paper-VII
Chemistry - VII

Unit-I (Inorganic Chemistry) 11 h

S6-I-1:Inorganic reaction mechanisms 4h

Labile and inert complexes, Thermodynamic and kinetic stability based on VBT & CFT: ligand substitution reactions – S_N1 and S_N2 in Octahedral complexes; substitution reactions of square planar complexes – Trans effect and applications of trans effect.
Reactions of tetrahedral complexes - Hydrolysis of silicon halides and phosphorous oxides.

S6-I-2:Bioinorganic chemistry 5h

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl^-). Toxic metal ions As, Hg & Pb
Oxygen transport and storage – structure of hemoglobin, binding and transport of oxygen. Fixation of CO_2 in photosynthesis- overview of light and dark reactions in photosynthesis. Structure of chloroph$_+$yll and coordination of magnesium. Electron transport in light reactions from water to NADP (Z – scheme).

S6-I-3:Hard and soft acids bases (HSAB) 2h

Classification, Pearson's concept of hardness and softness, application of HSAB principles – Stability of compounds / complexes, predicting the feasibility of reaction

UNIT - II (Organic Chemistry) 11 h

S6-O-1:Carbohydrates 6 h

Introduction: Classification and nomenclature – classification into mono, oligo and polysaccharides, into pentoses, hexoses *ETC*., into aldoses and ketoses.

Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structural elucidation: Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acids). Number of optically active, isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (No proof for configuration is required). Evidence for cyclic structure of glucose (some negative aldehyde tests and mutarotation). Cyclic structure of glucose: Proposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 – ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-n-hexane) Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure,Haworth formula).

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Inter Conversion of Monosaccharides: Aldopentose to aldo hexose – eg: Arabinose to D-glucose, D- mannose (kiliani – Fischer method). Epimers, Epimerisation- Lobry de bruyn van Ekenstein rearrangement. Aldohexose – Aldopentose eg: D-glucose to D-arabinose by Ruff's degradation. Aldohexose(+) (glucose) to ketohexose (–)(Fructose) and Ketohexose (Fructose) to aldohexose (Glucose).

S6-O-2Amino acids and proteins **5 h**

acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples – Glycine, Alanine, valine and Leucene) by following methods: a) From halogenated Carboxylic acid b)Malonic ester synthesis c) strecker's synthesis.Physical properties: Optical activity of naturally occurring amino acids: L – configuration, irrespective of sign of rotation. Zwitter ion structure – salt like character, solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups – Lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins, peptide synthesis

Unit-III (Physical Chemistry) **11 h**

S6-P-1:Thermodynamics –I **11h**

A brief review of - Energy, work and heat units, mechanical equivalent of heat, definition of system, surroundings. I law of thermodynamics statement- various forms mathematical expression. Thermodynamic quantities- extensive properties and intensive properties, state function, path functions energy as a state function, and exact differential. Work of expansion and heat absorbed as path function.

Expression for work of expansion, sign convention problems on I law. Heat changes at constant pressure and heat changes at constant volume. Enthalpy. Heat capacities at constant pressure and constant volume. Derivation Cp-Cv = R.

Isothermal adiabatic processes. Reversible and irreversible processes. Reversible change and maximum work. Derivation of expression for maximum work for isothermal reversible process. Problems. Internal energy of an ideal gas. Joules experiment and Joule-Thompson coefficient. Adiabatic changes in ideal gas derivation of equation, PV^{γ} = constant. P-V curves for isothermal and adiabatic processes.

Heat of a reaction at constant volume and at constant pressure, relation between ΔH and ΔV.

Variation of heat of reaction with temperature. Kirchhoff's equation and problems. Limitations of I law and need for II law. Statement of II law of thermodynamics. Cyclic process. Heat engine, Carnot's theorem, Carnot's cycle. Derivation of efficiency of heat engine problems. Thermodynamic scale of temperature.

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Unit-IV **12 h**

S6-G-1: Proton Magnetic Resonance Spectroscopy **4h**

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals – spin-spin coupling, representation of
1
proton NMR spectrum – Integrations. H^1 NMR spectrum of – ethyl bromide, acetaldehyde,
1,1, 2-tribromo ethane, ethyl acetate and acetophenone. First order and Second order spectra and complex spetra, Nuclear Overhauser enhancement Efffect (NOE).
NMR Spectra of Fluxional molecules- Examples

S6-G-2: Mass Spectrometry **4 h**

Electron Impact Mass: Basic principles, Nitrogen rule, types of ions: Molecular ion, fragment ion and isotopic ions, representation of mass spectrum, types of peaks (molecular ion, fragment and isotopic ion peaks). Determination of molecular weight Mass spectrum of ethyl chloride, ethyl bromide and acetophenone.

S6-G-3: Thermodynamics- II **4 h**

Entropy: Definition from Carnot's cycle. Entropy as a state function. Entropy as a measure of disorder. Sign of entropy change for spontaneous and non- spontaneous processes & equilibrium processes. Entropy changes in i). Reversible isothermal process, ii). reversible adiabatic process, iii). phase change, iv). reversible change of state of an ideal gas. Problems. Entropy of mixing inert perfect gases. Free energy Gibb's function (G) and Helmholtz's function (A) as thermodynamic quantities. Concept of maximum work and net work ΔG ascriteria for spontaneity. Derivation of equation $\Delta G = \Delta H - T\Delta S$. significance of the equation.
Gibbs equations and the Maxwell relations. Variation of G with P, V and T.

References :

Unit- I

1. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd Wiley Publishers (2001).
2. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
3. Metal Ions In Reaction mechanisms, K.Veera Reddy. Galgotia Publications Pvt Ltd(2004)

Unit- II

1. Text book of organic chemistry by Soni. Sultan Chand & Sons; Twenty Ninth edition (2012)
2. General Organic chemistry by Sachin Kumar Ghosh. . New Age Publishers Pvt Ltd (2008)
3. Text book of organic chemistry by Morrison and Boyd. Person(2009)
4. Text book of organic chemistry by Graham Solomons. Wiley(2015)
5. Text book of organic chemistry by Bruice Yuranis Powla. 2nd Edition **(2012)**

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Unit III

1. Principles of physical chemistry by Prutton and Marron. The Macmillan Company; 4th edition (1970)
2. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand & sons.(2011)
3. Text Book of Physical Chemistry by Puri, Sharmaand Pattania. chand and Co.(2017)
4. Physical Chemistry by Atkins & De Paula, 8th Edition, **2009**
5. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
6. Physical Chemistry through problems by S.K. Dogra. (2015)
7. Text Book of Physical Chemistry by R.P. Verma.
8. Elements of Physical Chemistry byLewis Glasstone. Macmillan (1966)
9. Thermodynamics by Rajaram, Vishal Publishing Co,(2013)

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Unit IV

1. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd Wiley Publishers (2001).
2. Organic Spectroscopy, William Kemp Palgrave Macmillan; 2nd Revised edition edition (1 February 1987)
3. Principles of physical chemistry by Prutton and Marron.(The Macmillan Company; 4th edition (1970)
4. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand & sons.(2011).
5. Text Book of Physical Chemistry by Puri,Sharmaand Pattania. chand and Co.(2017)
6. Thermodynamics by Rajaram. Vishal Publishing Co,(2013)

Semester - VI

Laboratory Course

Paper VII

Qualitative and Spectral Analysis of Organic Compounds: 45hrs (3 h/w)

Qualitative analysis: Identification of an Organic compound through the functional group analysis, determination of melting points/boiling points, functional group tests and preparation of suitable derivatives of the following:

Carboxylic acids, phenols, amines, urea, thiourea, carbohydrates, aldehydes, ketones, amides, nitro hydrocarbons, ester and naphthalene.

Spectral analysis Determination of structures from combined spectral data (IR, ^{1}H-NMR and Mass): Minimum of five problems.

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B.Sc. Chemistry III Year
Semester-VI, Paper-VIII
Elective-A (3 Credits)
Medicinal Chemistry 45Hrs

Unit- I:Introduction and Terminology 11Hrs

S6-E-A-I: Diseases: Common diseases, infective diseases–insect borne, air-borne, water-borne and hereditary diseases.

Terminology in Medicinal Chemistry: Drug, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics, metabolites, anti metabolites and therapeutic index.

Drugs: Nomenclature: Chemical name, Generic name and Trade names with examples; Classification: Classification based on structures and therapeutic activity with examples. **ADME**: a) Absorption: Definition, absorption of drugs across the membrane – active and passive absorption, routes of administration of drugs. b) Distribution: definition and effect of plasma protein binding. c) Metabolism: definition, phase I and phase II reactions.
d) Elimination: definition and renal elimination.

Unit-II: Enzymes and Receptors **11Hrs**

S6-E-A-II: Enzymes: Introduction. Mechanism and factors affecting enzyme action, Specificity of enzyme action (including stereo specificity), Enzyme inhibitors and their importance. Types of inhibition - reversible, irreversible and their subtypes with examples.

Receptors: Introduction, Drug action-receptor theory, Mechanism of drug action, concept of agonists and antagonists with examples. Drug receptor interactions involved in drug receptor complex. binding role of –OH group, -NH_2 group, quaternary ammonium salts and double bond. Structure – activity relationships of drug molecules, explanation with sulfonamides.

Unit- III: Synthesis and Therapeutic Activity of Drugs **12Hrs**

S6-E-A-III: Introduction, synthesis and therapeutic activity of :

Chemotherapeutics: Sulphanilamide, dapsone, Pencillin-G (semi synthesis), Chloroquin, Isoniazid, Cisplatin and AZT.

Drugs to treat metabolic disorders: Anti diabetic - Tolbutamide; Antiinflammatiory – Ibuprofen; Cardiovascular- Glyceryl trinitrate; Antipyretic (paracetamol, aspirin) and Antacid- Omeprazole.

Drugs acting on nervous system: Anesthetics-definition, Classification-local and general. Volatile- Nitrous oxide, chloroform uses and disadvantages. Local anesthetics – benzocaine.

Unit- IV: Molecular Messengers and Health Promoting Drugs **11Hrs**

S6-E-A-IV: Molecular Messengers: Introduction to hormones and neurotransmitters, Thyroid hormones, Antithyroid drug-Carbimazol. Adrenaline: Adrenergic drugs- salbutamol, atenelol. Serotonin: SSRIs- fluoxetine. Dopamine: Antiparkinson drug- Levodopa .

Health promoting drugs: Introduction, sources, Deficiency disorders and remedy of Vitamins A,B, C, D, E K and micronutrients – Na, K, Ca, Cu, Zn and I .

Reference books

1. G.L. Patrick: Introduction to Medicinal Chemistry, Oxford University Press, New York. 2013.
2. Thomas Nogrady, Medicinal Chemistry, Oxford Univ. Press, New York.2005.
3. David William and Thomas Lemke, Foye's Principles of Medicinal Chemistry, Lippincott Williams & Wilkins, 2008.
4. Ashutosh Kar Medicinal Chemistry, New Age International, 2005.
5. O.D.Tyagi & M.Yadav Synthetic Drugs by, Anmol Publications,1998.
6. Medicinal Chemistry by Alka L. Gupta, PragatiPrakashan.
7. G. L. David Krupadanam, D.Vijaya Prasad, K.Varaprasad Rao, K. L. N. Reddy, C. Sudhakar, Drugs, Universities Press (India) Ltd. 2012.

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B.Sc. Chemistry III Year
Semester –VI, Paper-VIII
Elective-B (3 Credits)
Agricultural and Fuel Chemistry **45 Hrs**

Unit I: – Pesticides **12Hrs**

S6-E-B-I: Introduction, Definition, classification of pesticides based on use (target). Toxicity and chemical structure with examples. Adverse effects of pesticides and its impact on environmental pollution.

Synthesis, technical manufacture and uses of representative pesticides in the following classes: Organochlorines (Cypermethrin); Organophosphates (Parathion); Carbamates (carbaryl); Quinones (Chloranil), Anilides (Alachlor).

Pesticide formulations: Dusts, Granules, Wettable powders, Emulsions and Aerosols.

Biopestcides : Introduction: Potential pesticidal plants of India, Role of Neem in plant protection-constituents, Azadirachtin and its role in pest control, Structure and mode of action of Pyrethrins(pyrethrin-1) and Pyrethroids (permethrin) and nicotinoids (Imidacloprid).

Unit II: – Fertilizers **11Hrs**

S6-E-B-II: Introduction: (need of fertilizers), functions of essential plant nutrients (N, P, K), Classification formula and uses of fertilizers:

Nitrogenous fertilizers: Ammonium nitrate, Urea, Calcium Cyanamide, Calcium Ammonium Nitrate, Sodium Nitrate, Ammonium Chloride and their uses.

Phosphate fertilizers: Normal super phosphate, Triple Super Phosphate, Ammonium Phosphate and their uses.

Potassium fertilizers: Potassium chloride, potassium nitrate, potassium sulphate and uses. **Complex fertilisers:** Diaammonium Phosphate and mixed fertilizers their uses. Manufacture of urea and Super phosphate of lime and their reactions in the soil.

Biofertilizers – Introduction, definition, classification, Rhizobium, Azatobactor, Azospirillium, Azolla, Blue Green Algae, Vermicomposting and uses.

Organic farming: The principal methods, crop rotation, green manures and compost, biological pest control, and mechanical cultivation and uses.

Unit III: Energy Sources and Coal **11Hrs.**

S6-E-B-III: Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.

Coal: Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Unit IV: Petroleum, Petrochemical Industry and Lubricants **11Hrs.**

S6-E-B-IV: Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications.

Fractional Distillation - Principle and process, Cracking -Thermal and catalytic cracking, Reforming of Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from

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biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene and their uses.

Lubricants: Classification of lubricants, Properties and functions of lubricants (viscosity index, cloud point, pour point) and their determination. Lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants.

Reference books

1. N. N. Melnikov, Chemistry of pesticides; Springer-Verlag- Technology & Engineering (2012).
2. Thomas A. Unger Pesticide Synthesis Handbook; Elsevier, (2000).
3. R. Cremlyn Pesticides; John Wiley, 1980.
4. A. K. Kolay Manures and Fetrtilisers; Published by Atlantic (2007).
5. Stocchi, E. Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK (1990).
6. Jain, P.C. & Jain, M. Engineering Chemistry Dhanpat Rai & Sons, Delhi.
7. Sharma, B.K. & Gaur, H. Industrial Chemistry, Goel Publishing House, Meerut (1996).

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Semester - VI

Laboratory course

Experiments in Physical Chemistry-II

Paper VIII (Physical Chemistry) **45hrs (3 h/w)**

1. Kinetics

a) Determination of specific reaction rate of the hydrolysis of methyl acetate catalyzed by hydrogen ion at room temperature.

b) Determination of rate of decomposition of hydrogen peroxide catalyzed by $FeCl_3$.

2. Electrochemistry

A. Potentiometry:

a) Determination of redox potential of Fe^{2+} /Fe^{3+} by potentiometric titration of ferrous ammonium sulphate vs. potassium dichromate.

b) Precipitation titration of KCl vs. $AgNO_3$ -Determination of given concentration of silver nitrate.

B. pH metry:

a) pH metric titration of strong acid (HCl) vs. strong base- Determination of the concentration of the given acid.

b) pH metric titration of weak acid(acetic acid) with strong base(NaOH).- Determination of acid dissociation constant (K_a) of weak acid.

3. Conductometry:

Determination of overall order: Saponification of ethyl acetate with NaOH by conductance measurements.

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RESOLUTIONS

After discussion the following resolutions were adopted.

1) It was resolved to adopt the syllabus prescribed by Osmania University for B.Sc (Chemistry), & M.Sc(Organic Chemistry) (I and II Year) without making any major changes for the Academic year 2019-2020. This includes Course Structure, Course Objectives, Course Outcomes, credits, syllabus, and Instructional Hours under the reorganized CBCS.
2) It was resolved to follow the syllabus (for I to IV semesters) of Osmania University *in toto*. There will be 4 units and 5 credits(including theory and Practicals) for I to VI semesters of Chemistry for B.Sc. The students who are in the II & III year (III to VI semesters)will study the syllabus prescribed by the university last year (2018-19). The syllabus, question paper blue print for III and IV semesters will be followed as per the resolution taken in the last BoS meeting.
3) The question paper pattern will be followed as per the decision taken in the academic council. The pattern is 70:30. For B.Sc. I and II semester, there will be 2 sections, namely A and B. Section A consists of 8 questions, with choice of 6 questions by the student, each question carrying 5 marks. Section 'B' consists of 4 questions with internal choice, each question carrying 10 marks each. The blue print, scheme of examination submitted by the department of Chemistry was approved.Internal assessment consists of 5 multiple choice questions, 5 fill in the blanks (1 mark each) and 5 short answer questions (each question carries 2 marks).
4) For B.Sc. III, IV, V and VI semesters has also 70:30 pattern and there will be 3 sections, namely A, B and C. Section A consists of 8 questions, with choice of 4 questions by the student, each question carrying $2^{1/2}$ marks. Section B consists of 8 questions, with choice of 4 questions by the student, each question carrying 5 marks. Whereas section 'C' consists of 4 questions with internal choice, each question carrying 10 marks each. The blue print, scheme of examination submitted by the department of Chemistry was approved. Internal assessment consists of 5 multiple choice questions, 5 fill in the blanks (1 mark each) and 5 short answer questions (each question carries 2 marks).
5) It was resolved to approve the panel of examiners prepared by the department of Chemistry.
6) Practical Examination Pattern for both B.Sc. and M.Sc. will remain same as last year. Syllabus of M.Sc. (Organic Chemistry) is adopted *in toto*. Question paper pattern will be as per last academic year.

Telangana State Council of Higher Education, Govt. of Telangana B.Sc., CBCS Common Core Syllabi for all Universities in Telangana

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B.Sc., Chemistry from 2019-2020

CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
FIRST YEAR- SEMESTER I				
BS 101	Ability Enhancement Compulsory Course AECC-1	ES	2	2
BS 102	English	CC-1A	4	4
BS 103	Second language	CC-2A	4	4
BS 104	Optional I	DSC-1A	4T+3P=7	4+1=5
BS 105	Optional II	DSC-2A	4T+3P=7	4+1=5
BS 106	**Optional III- Chemistry - I**	**DSC-3A**	**4T = 7 3P**	**4 =5 1**
	Laboratory Course – I (Qualitative Analysis - Semi Micro Analysis of Mixtures)			
	Total Credits		**31**	**25**
FIRST YEAR- SEMSTER II				
BS 201	Ability Enhancement Compulsory Course AECC-2	BCS	2	2
BS 202	English	CC-1B	4	4
BS 203	Second language	CC-2B	4	4
BS 204	Optional I	DSC-1B	4T+3P=7	4+1=5
BS 205	Optional II	DSC-2B	4T+3P=7	4+1=5
BS 206	**Optional III- Chemistry - II**	**DSC-3B**	**4T = 7 3P**	**4 =5 1**
	Laboratory Course - II (Quantitative Analysis – Titrations)			
	Total Credits		**31**	**25**
SECOND YEAR- SEMSTER III				
BS 301	i) Safety Rules in Chemistry Laboratory and Lab Reagents ii) Remedial methods for pollution, drinking water and Soil fertility	**SEC-1 SEC-2**	**2 2**	**2 2**
BS 302	English	CC-1C	3	3
BS 303	Second language	CC-2C	3	3
BS 304	Optional I	DSC-1C	4T+3P=7	4+1=5
BS 305	Optional II	DSC-2C	4T+3P=7	4+1=5
BS 306	**Optional III- Chemistry - III**			
	Laboratory Course - III (Synthesis of Organic compounds)	**DSC-3C**	**4T = 7 3P**	**4 =5 1**
	Total Credits		31	**25**
SECOND YEAR- SEMSTER IV				
BS 401	i) Materials and their Applications ii) Chemistry of Cosmetics and Food Processing	**SEC-3 SEC-4**	**2 2**	**2 2**
BS 402	English	CC-1D	3	3
BS 403	Second language	CC-2D	3	3
BS 404	Optional I	DSC-1D	4T+3P=7	4+1=5
BS 405	Optional II	DSC-2D	4T+3P=7	4+1=5
BS 406	**Optional III- Chemistry - IV**	**DSC-3D**	**4T = 7 3P**	**4 = 5 1**
	Laboratory Course - IV (Qualitative Analysis of Organic Compounds)			
	Total Credits		31	**25**

* AECC: Ability Enhancement Compulsory Course, SEC: Skill Enhancement Course, DSC: Discipline Specific Course, GE: Generic Elective, ES: Environmental Science , BCS : Basic computer skills.

B.Sc. I Yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER I
Paper – I
Chemistry - I

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S1- I-1. Chemical Bonding 8 h

Ionic solids- lattice and solvation energy, solubility of ionic solids, Fajan's rule, polarity and polarizability of ions. VSPER Theory - Common hybridization-sp, sp^2, sp^3 , sp^3d, sp^3d^2 and sp^3d^3, shapes of molecules. Molecular orbital theory: Shapes and sign convention of atomic orbitals. Modes of bonds. Criteria for orbital overlap. LCAO concept. π and σoverlapping. Concept of Types of molecular orbitals- bonding, antibonding and non bonding. MOED of homonuclear diatomics - H_2, N_2, O_2^-, O_2^{2-}, F_2 (unhybridized diagrams only) and heteronuclear diatomics CO, CN^-, NO, NO^+ and HF. Bond order, stability and magnetic properties.

S1-I-2. P-Block Elements 1 7 h

Group–13: Structure of diborane and higher Boranes (B_4H_{10} and B_5H_9), Boron nitrogen compounds ($B_3N_3H_6$ and BN), Lewis acid nature of BX_3.
Group – 14: Carbides-Classification – ionic, covalent, interstitial – .Structures and reactivity. Industrial applications. Silicones – Classification – straight chain, cyclic and cross-linked.
Group – 15: Nitrides – Classification – ionic, covalent and interstitial. Reactivity – hydrolysis. Reactions of hydrazine, hydroxyl amine, phosphazenes.

Unit - II (Organic Chemistry) 15h(1 hr/week)

S1-O-1: Structural Theory in Organic Chemistry 5 h

Bond polarization: Factors influencing the polarization of covalent bonds, electro negativity – inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance - Mesomeric effect, application to (a) acidity of phenol. (b) acidity of carboxylic acids and basicity of anilines. Stability of carbo cations, carbanions and free radicals. Hyper conjugation and its application to stability of carbonium ions, free radicals and alkenes.

S1-O-2: Acyclic Hydrocarbons 6 h

Alkanes– Methods of preparation: From Grignard reagent, Kolbe synthesis. Chemical reactivity - inert nature, free radical substitution, Halogenation example- reactivity, selectivity and orientation.

Alkenes - Preparation of alkenes (with mechanism) (a) by dehydration of alcohols
(b) dehydrohalogenation of alkyl halides (c) by dehalogenation of 1,2 dihalides, Zaitsev's rule. Properties: Anti-addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti – Markonikov's addition). Oxidation (cis – additions) – hydroxylation by $KMnO_4$, OsO_4,

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anti addition- peracids (via epoxidation), hydroboration, ozonolysis – location of double bond. Dienes – Types of dienes, reactions of conjugated dienes – 1,2 and 1,4 addition of HBr to 1,3 – butadiene and Diels – Alder reaction.

Alkynes– Preparation by dehydrohalogenation of vicinal dihalides, dehalogenation of tetrahalides. Physical Properties: Chemical reactivity – electrophilic addition of X_2, HX, H_2O (tautomerism), Oxidation (formation of enediol, 1,2 diones and carboxylic acids) and reduction (Metal-ammonia reduction, catalytic hydrogenation).

Aromatic Hydrocarbons **4h**

Introduction to aromaticity: Huckel's rule – Benzene, Naphthalene and Anthracene. Reactions - General mechanism of electrophilic substitution, mechanism of nitration, sulphonation and halogenation, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para, and meta directing groups. Ring activating and deactivating groups with examples. Orientation – (i) activating groups: Amino, methoxy and alkyl groups. (ii) Deactivating groups - nitro, nitrile, carbonyl, carboxylic acid, sulphonic acid and halo groups.

Unit – III (Physical Chemistry) 15h(1 hr/week)

S1-P-1: Atomic structure and elementary quantum mechanics **3 h**

Black body radiation, heat capacities of solids, Rayleigh Jeans law, Planck's radiation law, photoelectric effect, Limitations of classical mechanics, Compton effect, de Broglie's hypothesis. Heisenberg's uncertainty principle.

S1-P-2: Gaseous State **5 h**

Deviation of real gases from ideal behavior. van der Waals equation of state. Critical phenomenon. PV isotherms of real gases, continuity of state. Andrew's isotherms of CO_2. The van der Waal's equation and critical state. Derivation of relationship between critical constants and van der Waal's constants. The law of corresponding states, reduced equation of states. Joule Thomson effect and inversion temperature of a gas. Liquifaction of gases: i) Linde's method based on Joule Thomson effect ii) Claude's method based on adiabatic expansion of a gas.

S1-P-3: Liquid State and Solutions **4 h**

Liquid State

Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only).

Solutions **3 h**

Liquid - liquid mixtures, ideal liquid mixtures**,** Raoult's and Henry's laws. Non ideal systems. Azeotropes: HCl-H_2O and C_2H_5OH - H_2O systems. Fractional distillation. Partially miscible liquids: Phenol – Water, Trimethyl amine – Water and Nicotine – Water systems.

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Unit - IV (General Chemistry) 15h(1 hr/week)

S1-G-1. General Principles of Inorganic Qualitative Analysis 6 h

Anion analysis: Theory of sodium carbonate extract,classification and reactions of anions- CO_3^{2-}, Cl^-, Br^-, SO_4^{2-}, PO_4^{3-}, BO_3^{3-}, CH_3COO^-, NO_3^-. Interfering ions. Cation Analysis: Principles involved - Solubility product, common ion effect, general discussion for the separation and identification of group I individual cations (Hg_2^{2+}, Ag^+, Pb^{2+}) with flow chart and chemical equations. Principle involved in separation of group II & IV cations. General discussion for the separation and identification of group II (Hg^{2+}, Pb^{2+}, Bi^{3+}, Cd^{2+}, Sb^{3+}), III (Al^{3+}, Fe^{3+}), IV (Mn^{2+}, Zn^{2+}) individual cations with flow chart and chemical equations. General discussion for the separation and identification of group V individual cations (Ba^{2+}, Sr^{2+}, Ca^{2+}) with flow chart and chemical equations. Theory of flame test. Identification of Group VI cations (Mg^{2+}, NH_4^+).

S1-G-2. Isomerism 5 h

Isomerism: Definition of isomers. Classification of isomers: Constitutional and Stereoisomers - definition and examples. Constitutional isomers: chain, functional and positional isomers. Stereoisomers: enantiomers and diastereomers – definitions and examples. Representation of stereoisomers – Wedge, Fischer projection, Sawhorse, Newmann formulae.

Conformational analysis : Classification of stereoisomers based on energy. Definition and examples Conformational and configurational isomers. Conformational analysis of ethane, n-butane, 1,2- dichloroethane,2-chloroethanol .Cyclic compounds: Baeyer's strain theory, Conformational analysis of cyclohexane

Cis-trans isomerism: E-Z-Nomenclature

S1-G-3: Solid state Chemistry 4 h

Laws of Crystallography: (i) Law of Constancy of interfacial angles (ii) Law of Symmetry-Symmetry elements in crystals (iii) Law of rationality of indices. Definition of space lattice, unit cell. Bravais Lattices and Seven Crystal systems (a brief review). X-ray diffraction by crystals; Derivation of Bragg's equation. Determination of structure of NaCl, KCl and CsCl (Bragg's method and Powder method).

References

General reference: B.Sc I Year Chemistry : Semester I, Telugu Academy publication, Hyd

Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers 2001. Chem.

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5. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn.
6. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
7. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press 1999.
9. Textbook of Inorganic Chemistry by R Gopalan.

Unit- II

1. Organic Chemistry by Morrison and Boyd.
2. Organic Chemistry by Graham Solomons.
3. Organic Chemistry by Bruice Yuranis Powla.
4. Organic Chemistry by L. G. Wade Jr.
5. Organic Chemistry by M. Jones, Jr
6. Organic Chemistry by John McMurry.
7. Organic Chemistry by Soni.
8. General Organic chemistry by Sachin Kumar Ghosh.
9. Organic Chemistry by C N pillai

Unit III

1. Principles of physical chemistry by Prutton and Marron.
2. Text Book of Physical Chemistry by Soni and Dharmahara..
3. Text Book of Physical Chemistry by Puri and Sharma.
4. Text Book of Physical Chemistry by K. L. Kapoor.
5. Physical Chemistry through problems by S.K. Dogra.
6. Text Book of Physical Chemistry by R.P. Verma.
7. Elements of Physical Chemistry byLewis Glasstone.

Unit IV

1. Qualitative analysis by Welcher and Hahn.
2. Vogel's Qualitative Inorganic Analysis by Svehla.
3. Text Book of Organic Chemistry by Morrison And Boyd.
4. Text Book of Organic Chemistry by Graham Solomons.
5. Text Book of Organic Chemistry by Bruice Yuranis Powla.
6. Text Book of Organic Chemistry by Soni.
7.Text Book of Physical Chemistry by Soni And Dharmahara..
8. Text Book of Physical Chemistry by Puri And Sharma.
9. Text Book of Physical Chemistry by K. L. Kapoor.

Laboratory Course 45h (3 h / week)

Paper I - Qualitative Analysis - Semi micro analysis of mixtures

Analysis of two anions (one simple, one interfering) and two cations in the given mixture.

Anions: $CO_3^{2-}, SO_3^{2-}, S^{2-}, Cl^-, Br^-, I^-, CH_3COO^-, NO_3^-, PO_4^{3-}, BO_3^{3-}, SO_4^{2-}$. .

Cations: Hg_2^{2+}, Ag^+, Pb^{2+}

$Hg^{2+}, Pb^{2+}, Bi^{3+}, Cd^{2+}, Cu^{2+}, As^{3+/5+}, Sb^{3+/5+}, Sn^{2+/4+}$

$Al^{3+}, Cr^{3+}, Fe^{3+}$

$Zn^{2+}, Ni^{2+}, Co^{2+}, Mn^{2+}$

$Ba^{2+}, Sr^{2+}, Ca^{2+}$

Mg^{2+}, NH_4^+

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SEMESTER WISE SYLLABUS
SEMESTER II
Paper – II
Chemistry – II

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S2-I-1 P-block Elements -II **7 h**

Oxides: Types of oxides (a) Normal- acidic, basic amphoteric and neutral (b) Mixed (c) sub oxide d) peroxide e) superoxide. Structure of oxides of C, N, P, S and Cl - reactivity, thermal stability, hydrolysis.

Oxy acids: Structure and acidic nature of oxyacids of B, C, N, P, S, Cl and I. Redox properties of oxyacids of Nitrogen: HNO_2 (reaction with $FeSO_4$, $KMnO_4$, $K_2Cr_2O_7$), HNO_3 (reaction with H_2S, Cu), HNO_4 (reaction with KBr, Aniline), $H_2N_2O_2$ (reaction with $KMnO_4$). Redox properties of oxyacids of Phosphorus: H_3PO_2 (reaction with $HgCl_2$), H_3PO_3 (reaction with $AgNO_3$, $CuSO_4$) . Redox properties of oxyacids of Sulphur: H_2SO_3 (reaction with $KMnO_4$, $K_2Cr_2O_7$), H_2SO_4 (reaction with Zn, Fe, Cu), $H_2S_2O_3$ (reaction with Cu, Au), H_2SO_5 (reaction with KI, $FeSO_4$), $H_2S_2O_8$ (reaction with $FeSO_4$, KI). Redox properties of oxy acids of Chlorine.

Interhalogens- Classification- general preparation- structures of AB, AB_3, AB_5 and AB_7 type and reactivity.

Poly halides- Definition and structure of ICl_2^-, ICl_4^- and I_3.

Pseudohalogens: Comparision with halogens.

S2-I-2: Chemistry of Zero group elements **2 h**

Isolation of noble gases, Structure, bonding and reactivity of Xenon compounds – Oxides, Halides and Oxy-halides. Clatherate compounds and Anomalous behavior of He (II)

S2-I-3: Chemistry of d-block elements **6 h**

Characteristics of d-block elements with special reference to electronic configuration, variable valence, ability to form complexes, magnetic properties &catalytic properties. Stability of various oxidation states and standard reduction potentials. Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu traids. Titanium triad – electronic configuration and reactivity of +3 and +4 states – oxides and halides. Chromium triad – reactivity of +3 and +6 states. Copper triad – reactivity of +1, +2 and +3 states.

Unit - II (Organic Chemistry) **15h(1 hr/week)**

S2-O-1: Halogen compounds **4 h**

Classification: alkyl (primary, secondary, tertiary), aryl, aralkyl, allyl, vinyl, benzyl. Chemical reactivity - reduction, formation of RMgX, Nucleophilic substitution reactions – classification into S_N1 and S_N2. Mechanism and energy profile diagrams of S_N1 and S_N2 reactions. Stereochemistry of S_N2 (Walden Inversion) 2-bromobutane, S_N1 (Racemisation) 1-bromo-1-phenylpropane Structure and reactivity – Ease of hydrolysis - comparison of alkyl, vinyl, allyl, aryl, and benzyl halides.

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S2-O-2: Hydroxy compounds and ethers **6 h**

Alcohols: Preaparation: 1°, 2° and 3° alcohols using Griganard reagent, Reduction of Carbonyl compounds, carboxylic acids and esters. Physical properties: H-bonding, Boiling point and Solubility. Reactions with Sodium, HX/$ZnCl_2$ (Lucas reagent), esterification, oxidation with PCC, alk. $KMnO_4$, acidic dichromates, conc. HNO_3 and Oppenauer oxidation (Mechanism).

Phenols: Preapartion: (i) from diazonium salts of anilines, (ii) from benzene sulphonic acids and (iii) Cumene hydroperoxide .

Properties: Acidic nature, formation of phenoxide and reaction with R-X, electrophilic substitution; halogenations, Riemer Tiemann reaction (Mechanism), Kolbe reaction (Mechanism), Gattermann-Koch reaction, Azo-coupling reaction, Schotton-Boumann raction, Houben-Hoesch condensation, .

Ethers: Nomenclature, preparation by (a) Williamson's synthesis (b) from alkenes by the action of conc. H_2SO_4. Physical properties – Absence of Hydrogen bonding, insoluble in water, low boiling point. Chemical properties – inert nature, action of conc. H_2SO_4 and HI.

S2-O-3 Carbonyl compounds **5 h**

Preparation of aldehydes & ketones from acid chloride,1,3-dithianes, nitriles and from carboxylic acids. Special methods of preparing aromatic aldehydes and ketones by (a) Oxidation of arenes (b) Hydrolysis of benzal halides Physical properties – absence of Hydrogen bonding. Reactivity of the carbonyl groups in aldehydes and ketones. Chemical reactivity: Addition of (a) $NaHSO_3$ (b) HCN (c) RMgX (d) NH_3 (e) RNH_2 (f) NH_2OH (g) $PhNHNH_2$ (h) 2,4-DNP (Schiff bases). Addition of H_2O to form hydrate , chloral hydrate (stable), addition of alcohols - hemi acetal and acetal formation. Cannizaro reaction. Oxidation reactions – $KMnO_4$ oxidation and auto oxidation, reduction – catalytic hydrogenation, mechanism of Clemmenson's reduction, Wolf-kishner reduction, Meerwein Pondoff Verly reduction. Reduction with LAH, $NaBH_4$.

Unit - III (Physical Chemistry) 15h(1 hr/week)

S2-P-1: Electrochemistry **15 h**

Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific and equivalent conductance with dilution. Migration of ions and Kholrausch's law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law - its uses and limitations. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf's method for attackable electrodes. Applications of conductivity measurements: Determination of degree of dissociation, determination of Ka of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Electrolytic and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. Electro motive force (EMF) of a cell and its measurement. Computation of EMF. Types of reversible electrodes- the gas electrode, metal-metal ion, metal-insoluble

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salt and redox electrodes. Electrode reactions, Nernst equation, cell EMF and Single electrode potential, Standard Hydrogen electrode – reference electrodes (calomel electrode) – standard electrode potential, sign conventions, electrochemical series and its significance. Applications of EMF measurements. Calculation of thermodynamic quantities of cell reactions (Gibbs free energy G, Helmholtz free energy and Equilibrium constant K). Determination of pH using hydrogen electrode, glass electrode and quinhydrone electrode. Solubility product of AgCl. Potentiometric titrations.

Unit – IV (General Chemistry) 15 h (1 hr/week)

S2-G-1: Theory of Quantitative Analysis 6 h

Volumetric Analysis: Introduction, standard solutions, indicators, end point, titration curves, Types of titrations: i) neutralization titration- principle, theory of acid base indicators, titration curves and selection of indicators- strong acid - strong base, strong acid –weak base, weak acid-strong base and weak acid –weak base. Theory of redox titrations - internal($KMnO_4$) and external indicators – use of diphenylamine and ferroin indicators. Theory of complexometric titrations – use of EBT, Murexide and Fast sulphone black indicators. Role of pH in complexometric titrations. Precipitation titrations – theory of adsorption indicators.

Gravimetric analysis- Introduction, nucleation, precipitation, growth of precipitate, filtration and washing, drying and incineration of precipitate, coprecipitation and post precipitation. Determination of Ni^{2+}

S2-G-2: Stereoisomerism 5 h

Optical activity: Definition, wave nature of light, plane polarised light, optical rotation and specific rotation, chiral centers. Chiral molecules: definition and criteria - absence of plane, center and S_n axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans-1,2-dichlorocyclopropane). Molecules with constitutionally symmetrical chiral carbons (Tartaric acid) Molecules with constitutionally unsymmetrical chiral carbons (2,3dibromopentane). D, L configuration – examples. R, S – configuration: Cahn-Ingold-Prelog rules, examples for asymmetric and disymmetric molecules.

S2-G-3: Dilute Solutions & Colligative Properties 4 h

Dilute Solutions, Colligative Properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis - laws of osmotic pressure, its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point.

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References

General reference: B.Sc I Year Chemistry : Semester II, Telugu Academy publication, Hyd

Unit I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications1996.
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers 2001.
4. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press1989.
5. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press 1999.
6. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th Edn.
7. Textbook of inorganic chemistry by R Gopalan.

Unit II

1. Organic Chemistry by Morrison and Boyd.
2. Organic Chemistry by Graham Solomons.
3. Organic Chemistry by Bruice Yuranis Powla.
4. Organic Chemistry by L. G. Wade Jr.
5. Organic Chemistry by M. Jones, Jr
6. Organic Chemistry by John McMurry.
7. Organic Chemistry by Soni.
8. General Organic chemistry by Sachin Kumar Ghosh.
9. Organic Chemistry by C N pillai

Unit III

1. Physical chemistry by P W Atkins
2. Principles of physical chemistry by Prutton and Marron.
3. Text Book of Physical Chemistry by Soni and Dharmahara.
4. Text Book of Physical Chemistry by Puri and Sharma
5. Text Book of Physical Chemistry by K. L. Kapoor
6. Physical Chemistry through problems by S.K. Dogra.
7. Elements of Physical Chemistry by Lewis and Glasstone.
8. Material science by Kakani & Kakani

Unit IV

1. Vogel's Text Book of Quantitative Analysis by G.H.Jeffery, J.Bassett, J.Mendham and R.C. Denney 5th edn Addison Wesley Longman Inc. 1999.
2. Quantitative Analysis by Day and Underwood Prentice Hall (India) VI Edn..
3. Nano: The Essentials by T. Pradeep, McGraw-Hill Education.
4. Chemistry of nanomaterials: Synthesis, Properties and applications by CNR Rao et.al.
5. Nanostructured Materials and Nanotechnology, edited by Hari Singh Nalwa, Academic Press
6. Practical chemistry by V K Ahluwalia, Sunitha Dhingra and AdarshGulati.

Laboratory Course — 45hrs (3 h / week)

Paper II- Quantitative Analysis

Acid - Base titrations

1. Estimation of Carbonate in Washing Soda.
2. Estimation of Bicarbonate in Baking Soda.
3. Estimation of Carbonate and Bicarbonate in the Mixture.

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4. Estimation of Alkali content in Antacid using HCl.
5. Estimation of NH_4^+ by back titration

Redox Titrations

1. Determination of Fe(II) using $K_2Cr_2O_7$
2. Determination of Fe(II) using $KMnO_4$ with sodium oxalate as primary standard.
3. Determination of Cu(II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard

Complexometric Titrations

1. Estimation of Mg^{2+}
2. Estimation of Cu^{2+}

B.Sc II Yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER III
Paper-III
Chemistry - III

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S3-I-1: Chemistry of f-block elements: 5 h

Chemistry of Lanthanides**:** Position in periodic table,Electronic structure, oxidation state, ionic and atomic radii- lanthanide contraction- cause and consequences, anomalous behavior of post lanthanides-complexation- type of donor ligands preferred. Magnetic properties-paramagnetism. Colour and spectra, f-f transitions –occurrence and separation– ion exchange method, solvent extraction.

Chemistry of actinides- general features – electronic configuration, oxidation state, actinide contraction, colour and complex formation. Comparison with lanthanides.

S3-I-2: Coordination Compounds-I 6 h

Simple inorganic molecules and coordination complexes. Nomenclature – IUPAC rules, 1. Coordination number, coordination geometries of metal ions, types of ligands. 2.Brief review of Werner's theory,Sidgwick's electronic interpretation and EAN rule and their limitations. (Valence bond theory (VBT) – postulates and application to (a) tetrahedral complexes $[Ni(NH_3)_4]^{2+}$, $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ **(**b) Square planar complexes $[Ni(CN)_4]^{2-}$, $[Cu(NH_3)_4]^{2+}$, $[PtCl_4]^{2-}$ (c) Octahedral complexes $[Fe(CN)_6]^{4-}$, $[Fe(CN)_6]^{3-}$, $[FeF_6]^{4-}$, $[Co(NH_3)_6]^{3+}$, $[CoF_6]^{3-}$. Limitations of VBT. 3. Isomerism in coordination compounds, stereo isomerism – (a)geometrical isomerism in (i) square planar meta l complexes of the type$[MA_2B_2]$, $[MA_2BC]$, $[M(AB)_2]$, [MABCD]. (ii) Octahedral metal complexes of the type $[MA_4B_2]$, $[M(AA)_2B_2]$, $[MA_3B_3]$ using suitable examples, (b) Optical isomerism in (i). tetrahedral complexes [MABCD], (ii). Octahedral complexes $[M(AA)_2B_2]$, $[M(AA)_3]$ using suitable examples. Structural isomerism: ionization, linkage, coordination ligand isomerism using suitable examples.

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RESOLUTIONS

After discussion the following resolutions were adopted.

1) It was resolved to adopt the syllabus prescribed by Osmania University for B.Sc (Chemistry), & M.Sc(Organic Chemistry) (I and II Year) without making any major changes for the Academic year 2020-2021. This includes Course Structure, Course Objectives, Course Outcomes, credits, syllabus, and Instructional Hours under the reorganized CBCS.
2) It was resolved to follow the syllabus (for I to IV semesters) of Osmania University *in toto*.There will be 4 units and 5 credits(including theory and Practicals) for I to VI semesters of Chemistry for B.Sc. The students who are in the III year (V to VI semesters) will study the syllabus prescribed by the university for the academic year-2018-19. The syllabus, question paper blue print for VI and VI semesters will be followed as per the resolution taken in the last BoS meeting.
3) The question paper pattern will be followed as per the decision taken in the academic council. The pattern is 70:30. For B.Sc. I-VI semester, there will be 2 sections, namely A and B. Section A consists of 8 questions, with choice of 6 questions by the student, each question carrying 5 marks. Section 'B' consists of 4 questions with internal choice, each question carrying 10 marks each. The blue print, scheme of examination submitted by the department of Chemistry was approved.Internal assessment consists of 5 multiple choice questions, 5 fill in the blanks (1 mark each) and 5 short answer questions (each question carries 2 marks).
4) It was resolved to approve the panel of examiners prepared by the department of Chemistry.
5) Practical Examination Pattern for both B.Sc. and M.Sc. will remain same as last year. Syllabus of M.Sc. (Organic Chemistry) is adopted *in toto*. Question paper pattern will be as per last academic year.
6) In the present pandemic situation of COVID-19 any regulations and guidelines given by UGC, New Delhi, Higher education, Govt. of Telangana and Osmania University, Hyderabad will be adopted and implemented accordingly.

4. Estimation of Alkali content in Antacid using HCl.
5. Estimation of NH_4^+ by back titration

Redox Titrations

1. Determination of Fe(II) using $K_2Cr_2O_7$
2. Determination of Fe(II) using $KMnO_4$ with sodium oxalate as primary standard.
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B.Sc II Yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER III
Paper-III
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Chemistry of actinides- general features – electronic configuration, oxidation state, actinide contraction, colour and complex formation. Comparison with lanthanides.

S3-I-2: Coordination Compounds-I 6 h

Simple inorganic molecules and coordination complexes. Nomenclature – IUPAC rules, 1. Coordination number, coordination geometries of metal ions, types of ligands. 2.Brief review of Werner's theory,Sidgwick's electronic interpretation and EAN rule and their limitations. (Valence bond theory (VBT) – postulates and application to (a) tetrahedral complexes $[Ni(NH_3)_4]^{2+}$, $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ **(**b) Square planar complexes $[Ni(CN)_4]^{2-}$, $[Cu(NH_3)_4]^{2+}$, $[PtCl_4]^{2-}$ (c) Octahedral complexes $[Fe(CN)_6]^{4-}$, $[Fe(CN)_6]^{3-}$, $[FeF_6]^{4-}$, $[Co(NH_3)_6]^{3+}$, $[CoF_6]^{3-}$. Limitations of VBT. 3. Isomerism in coordination compounds, stereo isomerism – (a)geometrical isomerism in (i) square planar meta l complexes of the type$[MA_2B_2]$, $[MA_2BC]$, $[M(AB)_2]$, [MABCD]. (ii) Octahedral metal complexes of the type $[MA_4B_2]$, $[M(AA)_2B_2]$, $[MA_3B_3]$ using suitable examples, (b) Optical isomerism in (i). tetrahedral complexes [MABCD], (ii). Octahedral complexes $[M(AA)_2B_2]$, $[M(AA)_3]$ using suitable examples. Structural isomerism: ionization, linkage, coordination ligand isomerism using suitable examples.

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S3-I-3: Metal carbonyls and Organometallic Chemistry 4 h

Metal carbonyls: Preparation and properties of $Ni(CO)_4$. Structural features of $Ni(CO)_4$, $Fe(CO)_5$, $Fe_2(CO)_9$, $Fe_3(CO)_{12}$ and $Cr(CO)_6$ -18 valence electron rule.

Definition, nomenclature and classification of organometallic compounds. Methods of preparation, properties and applications of alkyl and aryl compounds of Li, Mg & Al.

Unit - II (Organic Chemistry) 15h(1 hr/week)

S3-O-1: Carboxylic acids and derivatives 5 h

Preparation: a) Hydrolysis of Nitriles, amides and esters. b) Carbonation of Grignard reagents. Special methods of preparation of Aromatic Acids - Oxidation of Arenes. Physical properties- hydrogen bonding, dimeric association,. Chemical properties – Reactions involving H, OH and COOH groups -salt formation, anhydride formation, Acid halide formation, Esterification (mechanism) & Amide formation. Reduction of acid to the corresponding primary alcohol - via ester or acid chloride. Degradation of carboxylic acids by Huns Diecker reaction, Schmidt reaction (Decarboxylation). Arndt – Eistert synthesis, Halogenation by Hell – Volhard - Zelensky reaction. Carboxylic acid Derivatives – Hydrolysis nand Amonolysis of acid halides, Acid anhydrides and esters (mechanism of ester hydrolysis by base and acid). Hydrolysis and dehydration of amides.

S3-O-2: Nitrohydrocarbons 3 h

Preparation of Nitroalkanes. Reactivity - halogenation, reaction with HNO_2 (Nitrous acid), Nef reaction, reduction. Aromatic Nitrohydrocarbons: Preparation of Nitrobenzene by Nitration. Physical properties, chemical reactivity –Reduction of Nitrobenzenes in different media.

S3-O-3: Amines, Cyanides and Isocyanides 7 h

Amines: classification into 1°, 2°, 3° Amines and Quarternary ammonium compounds. Preparative methods – Ammonolysis of alkyl halides, Gabriel synthesis, Hoffman's bromamide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties. Use of amine salts as phase transfer catalysts. Chemical Properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation. Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines). Electophilic substitutions of Aromatic amines – Bromination and Nitration, oxidation of aryl and 3° Amines, diazotisation. Diazonium salts: Preparation with mechanism. Synthetic importance – a) Replacement of diazonium group by – OH, X (Cl)- Sandmeyer and Gatterman reaction, by fluorine (Schiemann's reaction), by iodine, CN, NO_2, H and aryl groups. Coupling Reaction of diazonium salts. i) with phenols ii) with anilines. Reduction to phenyl hydrazines.

Cyanides and isocyanides: Structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iii)

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reduction iv) oxidation.

Unit III (Physical Chemistry) 15 h (1 hr/week)

S3-P-1:Thermodynamics –I **10 h**

A brief review of - Energy, work and heat units, mechanical equivalent of heat, definition of system, surroundings. First law of thermodynamics statement- various forms mathematical expression. Thermodynamic quantities- extensive properties and intensive properties, state function and path functions. Energy as a state function and exact differential. Work of expansion and heat absorbed as path function.

Expression for work of expansion, sign convention problems on first law. Heat changes at constant pressure and heat changes at constant volume. Enthalpy. Heat capacities at constant pressure and constant volume. Derivation of Cp-Cv = R. Isothermal adiabatic processes. Reversible and irreversible processes. Reversible change and maximum work. Derivation of expression for maximum work for isothermal reversible process. Problems. Internal energy of an ideal gas. Joules experiment. Joule-Thompson coefficient. Adiabatic changes in ideal gas, derivation of equation, PV^{γ}= constant. P-V curves for isothermal and adiabatic processes. Heat of a reaction at constant volume and at constant pressure, relation between ΔH and ΔV. Variation of heat of reaction with temperature. Kirchhoff's equation and problems. Limitations of first law and need for second law. Statement of second law of thermodynamics. Cyclic process. Heat engine, Carnot's theorem, Carnot's cycle. Derivation of efficiency of heat engine. Problems. Thermodynamic scale of temperature.

S3-P-2: Thermodynamics-II **5 h**

Entropy: Definition from Carnot's cycle. Entropy as a state function. Entropy as a measure of disorder. Sign of entropy change for spontaneous and non- spontaneous processes &equilibrium processes. Entropy changes in i). Reversible isothermal process, ii). Reversible adiabatic process, iii). Phase change, iv). Reversible change of state of an ideal gas. Problems. Entropy of mixing of ideal gases. Free energy Gibb's function (G) and Helmholtz'sfunction (A) as thermodynamic quantities. Concept of maximum work and network ΔG as Criteria for spontaneity. Derivation of equation $\Delta G = \Delta H - T\Delta S$. Significance of the equation. Gibbs equations and Maxwell relations. Variation of G with P, V and T.

Unit – IV (General Chemistry) 15 h (1 hr/week)

S3-G-1 Evaluation of analytical data **4 h**

Significant figures, accuracy and precision. Errors-classification of errors- determinate and indeterminate errors, absolute and relative errors. Problems based on mean, median, range, standard deviation

S3-G-2: Carbanions-I **5 h**

Introduction, acidic nature of α-hydrogens and tautomerism in carbonyl compounds, nitro hydrocarbons, ethyl acetoacetate, diethyl malonate. Terminal alkynes. Stabilty of carbanions Reactions : Aldol reaction, Perkin reaction, Benzoin condensation, haloform reaction, conversion of smaller alkynes to higher alkynes.

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S3-G-3: Phase Rule **6 h**

Statement and meaning of the terms – Phase, Component and Degrees of freedom, Gibb's Phase rule, phase equilibria of one component system – water system. Phase equilibria of two-component system – Solid-Liquid equilibria, simple eutectic –Pb-Ag system, desilverisation of lead. Solid solutions – compound with congruent melting point – Mg-Zn system and incongruent melting point – NaCl-H_2O system.

References

General reference: B.Sc II Year Chemistry : Semester III, Telugu Academy publication, Hyd

Unit- I

1. Analytical chemistry by G. L. David Krupadanam, D. Vijaya Prasad, K. Varaprasada Rao, K.L.N. Reddy and C. Sudhakar
2. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications(1996).
3. Concise Inorganic Chemistry by J.D. Lee 3rd edn Van Nostrand Reinhold Company(1977)
4. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
5. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
6. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press(1989).
7. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press (1999).
8. Textbook of Inorganic Chemistry by R Gopalan(Universities Press(2012)
9. College Practical chemistry by V K Ahluwalia, Sunitha Dhingra and Adarsh Gulati Universities Press (India) Limited(2012)

Unit- II

1. Text book of organic chemistry by Soni. Sultan Chand & Sons; Twenty Ninth edition (2012)
2. General Organic chemistry by Sachin Kumar Ghosh. New Age Publishers Pvt Ltd (2008).
3. Text book of organic chemistry by Morrison and Boyd. Person(2009)
4. Text book of organic chemistry by Graham Solomons. Wiley(2015)
5. Text book of organic chemistry by Bruice Yuranis Powla. (2012)
6. Text book of organic chemistry by C N pillai CRC Press (2012)
7. Organic Chemistry by L. G. Wade Jr.
8. Organic Chemistry by M. Jones, Jr
9. Organic Chemistry by John McMurry.

Unit III

1. Principles of physical chemistry by Prutton and Marron. The MacmillanCompany; 4th Edn.(1970)
2. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand and Sons.(2011)
3. Text Book of Physical Chemistry by Puri and Sharma. S. Nagin chand and Co.(2017)
4. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
5. Colloidal and surface chemistry , M. Satake, Y. Hayashi, Y.Mido, S.A.Iqbal and
6. M.S.sethi, Discovery Publishing Pvt.Ltd (2014)
7. Material science by Kakani & Kakani, New Age International(2016)
8. Physical Chemistry by Ira Levine (Author) McGraw-Hill Education; 6 edition (May 9, 2008)

Unit IV

1. Text book of organic chemistry by Morrison and Boyd, Person(2009)

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2. Text book of organic chemistry by Graham solomons, Wiley(2015)
3. Text book of organic chemistry by Sony, Sultan Chand & Sons; 29th edition (2012)
4. Text book of organic chemistry by Bruice yuranis Powla, (2012)
5. General Organic chemistry by Sachin kumar Ghosh, New Age Publishers Pvt Ltd (2008)

Laboratory Course

Paper III (Organic Synthesis) **45 h (3h/week)**

1. **Synthesis of Organic compounds:**

   Acetylation: Acetylation of salicylic acid, Benzoylation of Aniline.

   Aromatic electrophilic substitution: Nitration: Preparation of nitro benzene and m-dinitro benzene.

   Halogenation: Preparation of p-bromo acetanilide, Preparation of 2,4,6-tribromo phenol

   Oxidation: Preparation of benzoic acid from benzyl chloride.

   Esterification: Preparation of n-butyl acetate from acetic acid.

   Methylation: Preparation of - naphthyl methyl ether.

   Condensation: Preparation of benzilidine aniline and Benzaldehyde and aniline.

   Diazotisation: Azocoupling of β-Naphthol.

2. **Microwave assisted synthesis of Asprin – DEMO (demonstration only)**

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B.Sc. II yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER IV
Paper-IV
Chemistry - IV

Unit-I (Inorganic Chemistry) 15h (1 h/week)

S4-I-1: Coordination Compounds –II 11 h

Crystal field theory (CFT)- Postulates of CFT, splitting patterns of d-orbitals in ctahedral, tetrahedral, square planer with suitable examples. Crystalfield stabilization energies and its calculations for various dn configurations in octahedral complexes. High Spin Low Spin complexes. Colour and Magnetic properties of transition metal complexes. Calculations of magnetic moments spin only formula. Detection of complex formation - basic principles of various methods- change in chemical properties, solubility, colour, pH, conductivity, magnetic susceptibility.

Hard and soft acids bases (HSAB) - Classification, Pearson's concept of hardness and softness, application of HSAB principles – Stability of compounds / complexes, predicting the feasibility of reaction. Thermodynamic and kinetic stability of transition of metal complexes. Stability of metal complexes –stepwise and overall stability constant and their relationship and chelate effect determination of composition of complex by Job's method and mole ratio method.

Applications of coordination compounds: Applications of coordination compounds a) in quantitative and qualitative analysis with suitable examples b) in medicine for removal of toxic metal ions and cancer therapy c) in industry as catalysts polymerization – Ziegler Natta catalyst d) water softening.

S4-I-2:Bioinorganic Chemistry 4 h

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl-). Toxic metal ions As, Hg & Pb Oxygen transport and storage – structure of hemoglobin, binding and transport of oxygen. Fixation of CO2 in photosynthesis- overview of light and dark reactions in photosynthesis. Structure of chlorophyll and coordination of magnesium. Electron transport in light reactions from water to NADP+ (Z – scheme).

Semester-IV

Unit - II (Organic Chemistry) 15h(1 hr/week)

S4-O-1: Carbohydrates 6 h

Introduction: Classification and nomenclature. Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structural elucidation: Evidences for straight chain pentahydroxy aldehyde structure. Number of optically active, isomers possible for the structure, configuration

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of glucose based on D-glyceraldehyde as primary standard (No proof for configuration is required). Evidence for cyclic structure of glucose (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 – ketohexose structure. Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure,Haworth formula).

Inter Conversion of Monosaccharides: : Arabinose to D-glucose, D- mannose (kiliani – Fischer method). Epimers, Epimerisation- Lobry de bruyn van Ekenstein rearrangement. D-glucose to D-arabinose by Ruff's degradation. Aldohexose(+) (glucose) to ketohexose (–) (fructose) and Ketohexose(Fructose) to aldohexose (Glucose).

S4-O-2: Amino acids and proteins **5 h**

Classification. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples – Glycine, Alanine, Valine and Leucine) by following methods: a) From halogenated Carboxylic acid b)Malonic ester synthesis c) strecker's synthesis. Physical properties: Optical activity of naturally occurring amino acids. Zwitter ion structure – salt like character, definition of isoelectric point. Chemical properties: General reactions due to amino and carboxyl groups – Lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides. Primary structure of proteins, di peptide synthesis

S4-O-3: Heterocyclic Compounds **4 h**

Introduction and definition: 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring systems –Numbering. Aromatic character

Resonance structures: Explanation of feebly acidic character of pyrrole, electrophillic substitution, Halogenation, Nitration and Sulphonation. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene Paul-Knorr synthesis. Structure of pyridine, Basicity – Aromaticity – Comparison with pyrrole – preparation by Hantsch method and properties – Reactivity towards Nucleophilic substitution reaction – chichibabin reaction.

Unit III (Physical Chemistry) 15h (1 hr/week)

S4-P-1: Chemical Kinetics **11 h**

Introduction to chemical kinetics, rate of reaction, variation of concentration with time, rate laws and rate constant. Specific reaction rate. Factors influencing reaction rates: effect of concentration of reactants, effect of temperature, effect of pressure, effect of reaction medium, effect of radiation, effect of catalyst with simple examples. Order of a reaction.

First order reaction, derivation of equation for rate constant. Characteristics of first order reaction. Units for rate constant. Half- life period, graph of first order reaction, Examples- Decomposition of H_2O_2 and decomposition of oxalic acid, Problems.

Pseudo first order reaction, Hydrolysis of methyl acetate, inversion of cane sugar, problems. Second order reaction, derivation of expression for second order rate constant, examples-

Saponification of ester, $2O_3 \rightarrow 3O_2$, $C_2H_4+H_2 \rightarrow C_2H_6$. Characteristics of second order reaction, units for rate constants, half- life period and second order plots. Problems

S4-P-2: Photochemistry **4 h**

Introduction to photochemical reactions, Difference between thermal and photochemical reactions, Laws of photo chemistry- Grotthus Draper law, Stark–Einstein's Law of photochemical equivalence. Quantum yield. Examples of photo chemical reactions with different quantum yields. Photo chemical combinations of H_2–$Cl_2$and H_2–Br_2 reactions, reasons for the high and low quantum yield. Problems based on quantum efficiency. Consequences of light absorption. Singlet and triplet states. Jablonski diagram. Explanation of internal conversion, inter- system crossing, phosphorescence, fluorescence.

Unit III (General Chemistry) 15h (1 hr/week)

S4-G-1: Theories of bonding in metals **4 h**

Valence bond theory, Explanation of metallic properties and its limitations, Free electron theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors n-type and p-type, extrinsic & intrinsic semiconductors, and insulators**.**

S4-G-2: Carbanions-II **5 h**

Mannich reaction , Michael addition and Knoevengeal condensation Synthetic applications of Aceto acetic ester. Acid hydrolysis and ketonic hydrolysis: Preparation of ketones, monocarboxylic acids and dicarboxylic acids Malonic ester– synthetic applications. Preparation of (i) substituted mono carboxylic acids and (ii) substituted dicarboxylic acids.

S4-G-3: Colloids & Surface Chemistry **6 h**

Definition of colloids. Classification of colloids. Solids in liquids (sols): preparations and properties – Kinetic, Optical and Electrical stability of colloids. Protective action. Hardy–Schultz law, Gold number. Liquids in liquids (emulsions): Types of emulsions, preparation and emulsifier. Liquids in solids(gels): Classification, preparations and properties, General applications of colloids.

Adsorption: Types of adsorption. Factors influencing adsorption. Freundlich adsorption isotherm. Langmuir theory of unilayer adsorption isotherm. Applications.

References

General reference: B.Sc II Year Chemistry : Semester IV, Telugu Academy publication, Hyd

Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications (1996).
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn. Van Nostrand ReinholdCompany(1977)
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press(1989).
6. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press (1999).
7. Textbook of Inorganic Chemistry by R Gopalan, Universities Press,(2012)

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Unit- II

1. Text book of organic chemistry by Soni. Sultan Chand & Sons; Twenty Ninthedition (2012)
2. General Organic chemistry by Sachin Kumar Ghosh. New Age Publishers Pvt Ltd (2008)
3. Text book of organic chemistry by Morrison and Boyd. Person(2009)
4. Text book of organic chemistry by Graham Solomons. Wiley(2015)
5. Text book of organic chemistry by Bruice Yuranis Powla. **(2012)**
6. Text book of organic chemistry by C N pillai CRC Press (2012)
8. Organic Chemistry by L. G. Wade Jr.
9. Organic Chemistry by M. Jones, Jr
10. Organic Chemistry by John McMurry.

Unit III

1. Principles of physical chemistry by Prutton and Marron. The MacmillanCompany; 4th edn. (1970)
2. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand &sons.(2011)
3. Text Book of Physical Chemistry by Puri and Sharma. S. Nagin chand and Co.(2017)
4. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
5. Physical Chemistry through problems by S.K. Dogra. (2015)
6. Text Book of Physical Chemistry by R.P. Verma.
7. Elements of Physical Chemistry byLewis Glasstone. Macmillan (1966)
8. Industrial Electrochemistry, D. Pletcher, Chapman & Hall, London, 1990

Unit IV

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications(1996).
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn. Van Nostrand Reinhold Company (1977)
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
5. Text book of organic chemistry by Morrison and Boyd, Person (2009)
6. Text book of organic chemistry by Graham solomons, Wiley (2015)
7. Fundamentals of organic synthesis and retrosynthetic analysis by Ratna Kumar Kar, CBA,(2014)
8. Organic synthesis by Dr. Jagadamba Singh and Dr. L.D.S. Yadav, Pragati Prakashan, 2010
7. Stereochemistry of organic compounds by D. Nasipuri, New Academic Science Limited, 2012
8. Organic chemistry by Clayden, Greeves, Warren and Wothers, Oxford University Press, 2001
9. Fundamentals of Asymmetric Synthesis by G. L. David Krupadanam, Universities, Press 2014

Laboratory Course

Paper IV-

Qualitative Analysis of Organic Compounds: 45hrs (3 h/week)

Qualitative analysis: Identification of organic compounds through the functional group analysis - ignition test, determination of melting points/boiling points, solubility test, functional group tests and preparation of suitable derivatives of the following: Carboxylic acids, phenols, amines, urea, thiourea, carbohydrates, aldehydes, ketones, amides, nitro hydrocarbons, ester and naphthalene.

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B.Sc. Chemistry II Year Semester-III
Skill Enhancement Course- I (SEC-I) (2 Credits)
Rules in Chemistry Laboratory and Lab Reagents

Unit I: Laboratory Safety Rules and Regulations 15 h (1 hr/week)

General rules and regulations for lab safety: Minimizing Risks of Hazards, Personal Protective Equipment (PPE) - Hair, Dressing for the Laboratory, Eye Protection, Eyewash fountain, Gloves, Laboratory Protocols, Labeling Chemicals, Careful reading of labels Prevention of Inhaling Harmful Chemicals, Guide to Chemical Hazards, Chemical Spills etc,. Accidents use of fire extinguisher and first aid kit in the laboratory, safety symbols- Preparation of the charts by the students and display of chats in chemistry labs. Calibration of fractional weights, calibration of glass ware - burette, pipette, standard flask, Normality/Molarity and specific gravity of concentrated acids – Preparation of dilute solutions (Numerical problems). Precautions to be taken in the preparation of dilute acids and bases and bases. Preparation of stock solutions of salts with specific examples. Properties of primary standard salt and preparation of standard solution. Good laboratory practices-maintenance of observation book record.

UNIT 2: Preparation of Lab Reagents 15 h (1 hr/week)

Preparation of indicators and use of indicators in volumetric analysis- acid base titrations, redox titrations, precipitation titrations and complexometric titrations. Role of an indicator in detecting end point (Phenolphthalein, Methyl orange, Methyl-red, Potassium Chromate, Diphenylamine, EBT, Murexide, etc). Preparation of buffers – pH 10 ammonical buffer and acetate buffer solutions. Preparation of commonly used reagents : Ammonium hydroxide solution, Ammonium molybdate reagent, Ammonium hydrogen phosphate solution, Bayer's reagent, Benedict's solution, Bromine water, Dimethyl glyoxime reagent, 2,4-Dinitrophenyl hydrazine reagent, Eriochrome black-T reagent Fehling solution, Ferric chloride solution, Ferrous sulphate solution, Iodine solution, Molisch's reagent, Nessler's reagent, Neutral FeCl3, Schiff's reagent, Silver nitrate solution, Sodium carbonate solution , Sodium hydroxide (Caustic soda) solution, Starch solution, Tollen's reagent. (reference work and submission of assignments). Charts preparation depicting course content.

RECOMMENDED BOOKS

1. Vogel's Text Book of Quantitative Chemical Analysis, 5th edition.
2. Vogel's Text Book of macro and semimicro qualitative inorganic analysis. G. Svehla, 5th edition.
3. Chemistry Reagent Manual Prepared by Chemistry Department, SGTB Khalsa College under DBT's Star College Scheme, University of Delhi (Available: online)
4. American Chemical Society Safety in Academic Chemistry Laboratories 8th edition.

[Course objectives (CO)]: To improve the skills of students in the application of theory and practical knowledge. To fill the gap between theory and practicals. To train the students in understanding laboratory safety rules and to improve the skills in preparation of laboratory reagents]

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B.Sc. Chemistry II Year
Semester III
Skill Enhancement Course- II (SEC –II) (2 Credits)
REMEDIAL METHODS FOR POLLUTION, DRINKING WATER AND SOIL FERTILITY STANDARDS

UNIT I: Remedial Methods for Pollution Prevention and control of air pollution 15 h (1 hr/week)

Ozone hole-causes and harm due to ozone depletion. The effect of CFC's in Ozone depletion and their replacements. Global Warming and Greenhouse Effect Precautions to control global warming. Deleterious effect of pollutants - Endangered Monuments- acid rain. Precautions to protect monuments. Sources of Radiation pollution - Chernobyl accident and its Consequences. Radiation effect by the usage of cell phones and protection tips. Deleterious effects of cell phone towers and health hazards.

Sources of water pollution-(i). Pollution due to pesticides and inorganic chemicals, (ii). Thermal pollution (iii). Ground water pollution (iv). Eutrophication.

Methods for control of water pollution and water recycling. Dumping of plastics in rivers & oceans and their effect on aquatic life. Determination of (i) Dissolved Oxygen and (ii) Chemical Oxygen Demand in polluted water - Illustration through charts (or) demonstration of experiments. Sources of soil pollution (i). Plastic bags, (ii). Industrial and (iii). Agricultural sources. Control of soil pollution. Environmental laws in India. Environmental benefits of planting trees.

UNIT II: Drinking Water and Soil Fertility Standards and Analysis 15 h (1 hr/week)

Water Quality and Common Treatments for Private Drinking Water Systems: Drinking Water Standards-Primary Drinking Water Standards : Inorganics, Organics and Volatile Organic Chemicals. Secondary Drinking Water Standards-Inorganics and Physical Problems. Water Testing, Mineral Analysis, Microbiological Tests, Pesticide and Other Organic Chemical Tests. Principle involved in Water Treatment Techniques. (i) Reverse osmosis (ii) Disinfection methods such as chlorination, ultraviolet light, ozonation etc (iii) Chemical oxidation and (iv) Ion exchange (water softeners). Visit to nearby drinking water plants and interaction at sites.

Introduction to Soil Chemistry- Basic Concepts. Effect of pH on nutrient availability. Macronutrients and their effect on plants -Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus other macronutrients-Calcium, Magnesium and Sulfur. Micronutrients and their effect on plants. Boron ($B_4O_7^{2-}$), Copper (Cu^{2+}), Iron (Fe^{2+}, Fe^{3+}) Manganese (Mn^{2+}) Molybdenum (MoO_4^{2-}) Zinc (Zn^{2+}) Cobalt (Co^{2+}) Chlorine (Cl^-) and Others. Determination of soil nitrogen by Kjeldahl method- Illustration through charts (Or) demonstration of experiment. Visit to nearby agricultural forms and interaction with farmers. Discussion with farmers on the use of Soil Analysis Kits.

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References

1. A Text book for 'Remedial methods for pollution, drinking water and soil fertility standards', First Edition, Authors: Dr Mudvath Ravi, Gopu Srinivas, Putta Venkat Reddy, Vuradi Ravi Kumar, Battini Ushaiah, ISBN No. 978-93-5311-183-0.
2. Remedial methods for pollution, drinking water and soil fertility standards, Author: Dr G. Vanjatha.
3. Remedial methods for pollution, drinking water and soil fertility standards, Telugu version, Authors: Dr N. Yogi Babu, Dr. G. Vanajatha, M. Srilatha.
4. Environmental Pollution, download.nos.org/333courseE/10.pdf
5. CFC Replacements, butane.chem.uiuc.edu/pshapley/Environmental/L21/3.html
6. Effects of Acid Rain on Buildings www.air-quality.org.uk/12.php
7. Acid Rain Effects - Buildings - Chemistry chemistry.elmhurst.edu/vchembook/196buildings.html 8. How to protect national heritage - ways to protect monuments www.youthkiawaaz.com/2011/03/how-to-protect-national-heritage/.
9. Chernobyl nuclear power plant accident - NRC www.nrc.gov/reading-rm/doc-collections/fact-sheets/chernobyl-bg.pdf
10. Side-effects of harmful radiation from mobile phones and towers pib.nic.in/newsite/printrelease.aspx?relid=116304
11. Cell Phone Radiation Protection - Highly Effective Tips https: www.electricsense.com/775/how-to-protect-yourself-from-cell-phone-radiation/
12. Chemical Waste That Impact on Aquatic Life or Water Quality blog.idrenvironmental.com/chemical-waste-that-impact-on-aquatic-life-or-waterquality
13. Trees and Your Environment - Clean Air Gardening www.cleanairgardening.com/plantingtrees 14.water quality and common treatments for private drinking water . extension.uga.edu/publications/detail.html?number=b939
15. Soil chemistry https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDFdownloads/2.2-soil-chemistry.pdf
16. Soil Analysis-Determination of Available Nitrogen ... - Amrita Virtual Lab vlab.amrita.edu/?sub=2&brch=294&sim=1551&cnt=1
17. Determination of dissolved oxygen (DO) www.cutm.ac.in/pdf/env%20engg%20lab%20manual.pdf 18. Determination of chemical oxygen demand of wastewater www.pharmaguideline.com › quality control › test

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B.Sc. Chemistry II Year
Semester - IV
Skill Enhancement Course- III (SEC - III) (2 Credits)
Materials and their Applications

Unit – I: Types of Materials 15 h (1 hr/week)

Introduction: Materials and their importance. Classification of Materials, Advanced materials and their need. Types of Materials: Metals, ceramics, polymers and composites; Nature of bonding (Type of bond present). Types and applications of metal alloys: Classification- ferrous and non-ferrous alloys. Ferrous alloys -types and their applications. Non-ferrous alloys – Cu, Al, Ti alloys, their applications and super alloys.

Field Work- Collection of Metal Alloy Samples.

Types and Applications of Ceramics: Classification of Ceramics based on their application- glasses, clay products, refractories, abrasives, cements, and advanced ceramics. Glasses: Compositions and Characteristics of Some of the Common Commercial Glasses; Properties and applications of glass ceramics - preparation of charts depicting various types of glass and their use. Clay products: Structural clay products and the white wares. Refractories: Compositions of four Common Ceramic Refractory Materials, fireclay, silica, basic refractories ex. MgO and special refractories ex. Alumina and Zirconia Cements: Classification, preparation of cement and the setting process; quick setting cements; applications.

Field Work-Visit to industries and collection of samples of materials

Unit – II: Types of Polymers and Applications 15 h (1 hr/week)

Classification of Polymeric materials based on application: Coatings, adhesives, films, foams with examples Polymer Additives: Fillers, Plasticizers, Stabilizers, Colorants, Flame Retardants with examples.

Advanced Materials: Types of advanced materials - semiconductors, bio-compatible materials, smart materials, advanced polymeric materials and nano-engineered materials. Biocompatible materials: Definition. Materials used as biomaterials and their properties. Metals and alloys used in bone and joint replacement. Filling and restoration materials – dental cements, dental amalgams, dental adhesives.

Field Work- Visit to Dental Clinics and interaction with Doctors regarding materials used in Dental treatments.

Smart materials: Shape memory alloys- definition and examples (Ni-Ti alloys, Cu based alloys), applications. Conducting polymers: - Introduction, Electrically conducting polymers and their uses (polyaniline, polypyrrole, polyacetylene and polythiophene).

References

1. William D. Callister Materials Science and Engineering An Introduction, John Wiley & Sons, Inc, 2006.
2. Material science by Kakani and Kakani.
3. Sujata V., Bhat., ―Biomaterials‖, Narosa Publication House, New Delhi, 2002.
4. M. V. Gandhi and B. S. Thompson, ―Smart Materials and Structures‖, Chapman and Hall, London, First Edition, 1992.
5 Duerig,T. W., Melton, K. N, Stockel, D. and Wayman, C.M., ―Engineering aspects of Shapememory Alloys‖, Butterworth – Heinemann, 1990.
6. Conducting Polymers, Fundamentals and Applications A Practical Approach Authors: Chandrasekhar, Prasanna Ashwin-Ushas Corp., Inc. Kluwer Academic Publishers. Boston

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B.Sc. Chemistry II Year Semester IV
Skill Enhancement Course- IV (SEC - IV) (2 Credits)
Chemistry of Cosmetics and Food Processing

Unit-I: Chemistry of Cosmetics and Perfumes

A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, sunscreen lotions, lipsticks, talcum powder, nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours. Essential oils and their importance in cosmetic industries with reference to eugenol, geraniol, sandalwood oil, eucalyptus, 2-phenyl ethyl alcohol. Demonstration experiments or illustration of experimental procedures through charts for the preparation of talcum powder, shampoo and vanishing cream. Analysis of deodorants and antiperspirant - Aluminum, Zinc, Boric acid, Chloride and Sulphide.

Unit-II: Food Processing and Food Adulteration

Food processing: Introduction, methods for food processing, additives and preservatives. Food processing- impact on nutrition, analysis of calcium in milk by complexometric titration, spectrophotometric analysis of iron in foods, Spectrophotometric identification and determination of caffeine and benzoic acid in soft drinks. Field Work -Visit to Food Industries. Food adulteration: Adulterants in some common food items and their identification: Pulses, chilli powder, turmeric powder, milk, honey, spices, food grains and wheat flour, coffee powder, tea leaves, vegetable oil, ghee, ice creams, tomato sauce. Field Work-Collection of adulterated food samples, demonstration of a minimum of five experiments for testing adulterants in food items.

References

1. E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.
2. P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi
3. Sharma, B.K. & Gaur, H. Industrial Chemistry, Goel Publishing House, Meerut (1996).
4. Rameen Devi, Food Processing and Impact on Nutrition, Sc J Agric Vet Sci., AugSep 2015; 2(4A):304-311.
5. W.A. Poucher, Perfumes, Cosmetics and Soaps (1993).
6. Srilakshmi, Food Science. Edition: 3rd (2004). 7. Lillian Hoagland Meyer, Food chemistry (2008).
8. Handbook of Analysis and Quality Control for Fruit and Vegetable Products,S. Ranganna, Tata McGraw-Hill Education, 1986 – Food.
9. Fundamental concepts of applied chemistry J.C Ghosh, S. Chand and Co, Ltd, New Delhi.
10. Applied Chemistry K .Bhagavathi Sundhar, MJP publishers.

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B.Sc. CBCS CHEMISTRY

Theory Model Question Paper

For

Semester I, II, III, IV

Time : 3 Hrs. **Max.Marks : 80**

Note: Answer eight questions from Part-A and all questions from Part-B. Each question carries 4 marks in Part-A and 12 marks in Part-B.

Part-A **(8 x 4 = 32 Marks)**

(Short Answer Type)

I. Write any **Eight** questions of the following

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11. 11.
12. 12.

Part-B **(4 x 12 = 48 Marks)**

(Essay Answer Type)

II. Answer **all** Questions

1 a)

(OR)

b)

2 a)

(OR)

b)

3 a)

(OR)

b)

4 a)

(OR)

b)

B.Sc. CBCS CHEMISTRY

Practical Model Question Paper

For

Semester I, II, III, IV

Time : 3 Hrs. **Max.Marks : 50**

SEMESTER	External (Marks)	Internal (Marks)	Total (Marks)
I	40	10	50
II	40	10	50
III	40	10	50
IV	40	10	50

RESOLUTIONS

After discussion the following resolutions were adopted.

1) It was resolved to adopt the syllabus prescribed by Osmania University for M.Sc(Organic Chemistry) (I and II Year) without making any major changes for the Academic year 2021-2022. Whereas, for B.Sc.(Chemistry) a few changes have been made in Semester-II, IV and VI based on the local market needs and to impart employability among the students.
2) In the BSc Semester-II, **Water Chemistry** was introduced as there is a huge demand for Water Chemical Analysts owing to several packaged drinking water industries were located in Sangareddy region.
3) In the BSc Semester-IV, **Chemistry of Beverages** was introduced to bridge the skill gap and provide employability in Beverage industry as Global giants of Beverages like Pepsi and Cocacola are located in Sangareddy and Patancheru industrial corridor.
4) Sangareddy and Patancheru are well-known towns for pharmaceutical hub. The students hail from this area could get benefit of the paper **Drug Analysis**. In this regard, the paper has been introduced in BSc Semester-IV to make the students industry ready.
5) Course Structure, Course Objectives, Course Outcomes, credits, syllabus, and Instructional Hours under the reorganized CBCS pattern were also included.
6) It was resolved to follow the syllabus (for MSc(Organic Chemistry)-I to IV semesters) of Osmania University *in toto*. The syllabus, question paper blue print and credits pattern for I-IV semesters will be followed as per the resolution taken in the last BoS meeting.
7) There will be 4 units and 5 credits (including theory and Practicals) for I to VI semesters of Chemistry for B.Sc.
8) The question paper pattern will be followed as per the decision taken in the academic council. The pattern is 70:30. For B.Sc. I-VI semester, there will be 2 sections, namely A and B. Section A consists of 8 questions, with choice of 6 questions by the student, each question carrying 5 marks. Section 'B' consists of 4 questions with internal choice, each question carrying 10 marks each.The examination duration will be $2^{1/2}$ hours. The blue print, scheme of examination submitted by the department of Chemistry was

approved.Internal assessment consists of 5 multiple choice questions, 5 fill in the blanks (1 mark each) and 5 short answer questions (each question carries 2 marks).

9) It was resolved to approve the list of panel of examiners prepared by the department of Chemistry.

10) Practical Examination Pattern for both B.Sc. and M.Sc. will remain same as last year. Syllabus of M.Sc. (Organic Chemistry) is adopted *in toto*. Question paper pattern will be as per last academic year.The question paper pattern will be followed as per the decision taken in the academic council. The pattern is 70:30. For M.Sc. I-IV semester, there will be 2 sections, namely A and B. Section A consists of 8 questions, with choice of 5 questions by the student, each question carrying 6 marks. Section 'B' consists of 4 questions with internal choice, each question carrying 10 marks each. The examination duration will be $2^{1/2}$ hours. The blue print, scheme of examination submitted by the department of Chemistry was approved.Internal assessment consists of 10 multiple choice questions and 10 fill in the blanks (1 mark each).

11) In the present pandemic situation of COVID-19 any regulations and guidelines given by UGC, New Delhi, Higher education, Govt. of Telangana and Osmania University, Hyderabad will be adopted and implemented accordingly. Meanwhile, the COVID-19 examination pattern has also been included. The pattern is 70:30. For B.Sc. I-VI semester, there are 2 sections, namely, Section A and B. Section A consists of 8 questions, with choice of 4 questions, each question carrying $2^{1/2}$ marks. Section 'B' consists of 8 questions with choice of 4 questions, each question carrying 15 marks. Internal assessment consists of 5 multiple choice questions, 5 fill in the blanks (1 mark each) and 5 short answer questions (each question carries 2 marks).The external examination duration is 2 hours. For MSc-Organic Chemistry, I-IV semesters, there will also be 2 sections, namely, Section A and B. Section A consists of 8 questions, with choice of 5 questions, each question carrying 5 marks. Section 'B' consists of 8 questions with choice of 3 questions, each question carrying 15 marks.

12) Certificate course in **"Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"** designed and approved for Employability and Skill Development based on the local market needs.

Telangana State Council of Higher Education, Govt. of Telangana B.Sc, CBCS Common Core Syllabi for all Universities in Telangana

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B.Sc., Chemistry (for the batch admitted in 2019-2020)

THIRD YEAR- SEMESTER V				
CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
BS 501	**Chemistry of Cosmetics, Food Processing, Drugs and Pharmaceuticals**	**GE**	4	4
BS 502	English	CC-1E	3	3
BS 503	Second language	CC-2E	3	3
BS 504	Optional- I **A/B**	DSE -1E	------	4+1=5
BS 505	Optional- II **A/B**	DSE -2E	------	4+1=5
BS 506	Optional- III **A/B** **A. Spectroscopy and Chromatography** **(or)** **B. Metallurgy, Dyes and Catalysis**	**DSE -3E**	**4T** } **= 7** **3P** }	**4** } **1** } **= 5**
	Laboratory Course -V **Experiments in Physical Chemistry-I**			
	TOTAL			**25**
THIRD YEAR- SEMESTER VI				
BS 601	**Project in Chemistry/ Advanced Chemistry**			4
BS 602	English	CC-1F	3	3
BS 603	Second language	CC-2F	3	3
BS 604	Optional- I **A/B**	DSE-1F	--------	4+1=5
BS 605	Optional- II **A/B**	DSE -2F	--------	4+1=5
BS 606	Optional- III **A/B** **A. Medicinal Chemistry** **(or)** **B. Agricultural and Fuel Chemistry**	DSE -3F	**4T** } **= 7** **3P** }	**4** } **1** } **= 5**
	Laboratory Course -VI **Experiments in Physical Chemistry-II**			
	TOTAL			**25**
	TOTAL Credits			**150**

Semester V
Generic Elective (GE) Course - I (4 Credits)
(for B.Sc. Non Chemistry/B.A/B.Com Students)
Chemistry of Cosmetics, Food Processing, Drugs and Pharmaceuticals 60Hrs

Unit-I: Chemistry of Cosmetics and Perfumes 15 Hrs

A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, sunscreen lotions, lipsticks, talcum powder, nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours. Essential oils and their importance in cosmetic industries with reference to eugenol, geraniol, sandalwood oil, eucalyptus, 2-phenyl ethyl alcohol.

Demonstration experiments or illustration of experimental procedures through charts for the preparation of talcum powder, shampoo and vanishing cream. Chemistry and Applications of deodorants and antiperspirant - Aluminum, Zinc, Boric acid, Chloride and Sulphide.

Unit-II: Food Processing and Food Adulteration 15 Hrs

Food processing: Introduction, methods for food processing, additives and preservatives. Food processing- impact on nutrition,

Food adulteration: Adulterants in some common food items and their identification: Pulses, chilli powder, turmeric powder, milk, honey, spices, food grains and wheat flour, coffee powder, tea leaves, vegetable oil, ghee, ice creams, tomato sauce.

Food Packaging: Definition and function of packaging-Classification of packaging materials- different types of packaging materials such as glass, wood, metal, paper, wood, plastic etc., - advantages and disadvantages of each packaging material. Packaging materials and systems: corrugated fibre board boxes, shrink bundles and reusable packages. Effect of packaging materials on nutritive values of food.

Food labelling: Introduction, need and importance.

Unit – III: General Characteristics of Drugs 15Hrs

Introduction: Diseases – causes of diseases, Drug – definition and sources.

ADME of drugs (brief) – Absorption, distribution, drug metabolism (in liver), elimination (brief). Toxicity.

Examples (i) Zintac (Ranitidine, antacid) (ii) Paracetamol (antipyretic) (iii) Benadryl (Cough syrup). Characteristics of an ideal drug.

Nomenclature of Drugs: chemical name – generic name – trade name. Trade names for the given generic names – (i) Aspirin (ii) Amoxycillin (iii) Ciprofloxacin (iv) Paracetamol (v) Mebendazole

Drug formulations: Definition – need for conversion of drug into pharmaceutical (drug formulations) – Additives – diluents, binders, lubricants, antioxidants, flavourants, sweeteners, colourants, coating agents. Classification of Drug formulations: oral, parenterals and topical dosage forms –

advantages and disadvantages.

(i) Oral Dosage forms: Tablets (Aspirin – analgesic; Ciprofloxacin - antibacterial). Capsules (Amoxycillin – antibiotic; Omeprazole-antacid). Syrups (B-complex syrup; Benadryl- Cough syrup).

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(ii) Parenterals (Injection forms): Propranolol (antihypertensive), Heparin (anticoagulant)
(iii) Topical dosage forms: Creams and Ointments
(iv) Antiallergic: Aclometasone (Aclovate), Betamethasone valerate(2%) Multiple purposes,
(v) Anti-itching: Doxepin Zonalon), Antifungal: Miconozole (Dactarin, Neomicol), Ketoconazole, (Nizoral Cream), Fluconazole, Anesthetic- Lidocaine, (Lidocaine ointment) and Antiseptic: Boro Plus Cream, For burns -Iodine ointment

Unit – IV: Classification of Drugs **15Hrs**

Classification of drugs based on therapeutic action-Chemotherapeutic agents, Pharmacodynamic agents and drugs acting on metabolic processes.
Brief explanation for the following:
(i) Chemotherapeutic agents: Antimalarials – Chloroquine; Antibiotic – Amoxicillin; Antitubercular drugs – isoniazide; Antiprotozoals – metronidazole.
(ii) Pharmacodynamic agents
(a) Drugs acting on CNS: Diazepam (CNS depressant), General anesthetic (thiopental sodium), antipyretic and analgesic (Iburofen)
(b) Drugs acting on PNS: local anaesthetics (Benzocaine)
(c) Drugs acting on cardiovascular system: Metoprolol (antihypertensive agents), Nefidipine antianginal and antihypertensive agent)
(d) Drugs acting on renal system: Diuretics (Acetazolamide)
(iii) Drugs acting on metabolic processes
(a) Vitamins: Common name, source, deficiency, vitamin A, B2, B6, C, D, E and K – remedy
(b) Hormones: Function (brief) - deficiency of hormones (Insulin, Testosterone and Osterone)

Recommended Text Books and Reference Books

1. Industrial Chemistry, Vol -I, E. Stocchi, Ellis Horwood Ltd. UK.
2. Engineering Chemistry, P.C. Jain, M. Jain, Dhanpat Rai & Sons, Delhi.
3. Industrial Chemistry, Sharma, B.K. & Gaur, H. , Goel Publishing House, Meerut (1996).
4. Food Processing and Impact on Nutrition, Rameen Devi, Sc J Agric Vet Sci., Aug-Sep 2015; 2(4A):304-311.
5. Perfumes, Cosmetics and Soaps , W.A. Poucher, (1993).
6. A first course in food analysis by A Y Sathe
7. Food Science by N.Potter, CBS publishers
8. Food chemistry, Lillian Hoagland Meyer, (2008).
9. A Handbook of food packaging by F. A. Paine and H.Y. Paine.
10. Fundamental concepts of applied chemistry J.C Ghosh, S. Chand and Co, Ltd, New Delhi.
11. Applied Chemistry K .Bhagavathi Sundhar, MJP publishers.
12. Drugs by G.L.David Krupadanam, D.Vijaya Prasad, K.Varaprasad Rao, K.L.N.Reddy, C.Sudhakar , Universities Press (India) Limited 2007.
13. An Introduction to Medicinal Chemistry by Graham L. Patrick, Oxford University Press, New York. 1995

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B.Sc. Chemistry III Year
Semester-V, Paper-V
Discipline Specific Elective- A (4 Credits)
Spectroscopy and Chromatography **60Hrs**

Unit I: Molecular spectroscopy **15Hrs**

S5-E-A-I: Introduction to electromagnetic radiation, interaction of electromagnetic radiations with molecules, various types of molecular spectra.

Rotational spectroscopy (Microwave spectroscopy)

Rotational axis, moment of inertia, classification of molecules (based on moment of inertia), rotational energies, selection rules (No derivation), Determination of bond length of rigid diatomic molecules eg. HCl.

Infra red spectroscopy

Energy levels of simple harmonic oscillator, molecular vibration spectrum, selection rules. Determination of force constant (Problems). Qualitative relation of force constant to bond energies. Anharmonic motion of real molecules and energy levels. Modes of vibrations in polyatomic molecules. Characteristic absorption bands of various functional groups. Finger print nature of infrared spectrum.

Electronic spectroscopy

Bonding and antibonding molecular orbitals,electronic energy levels of molecules (σ, π, n), types of electronic transitions:σ-σ^*, n-σ^*, n-π^*, π-π^* with suitable examples. Selection rules, Terminology of chromophore, auxochrome, bathochromic and hypsochromic shifts. Absorption of characteristics of chromophones: diene, enone and aromatic chromophores. Representation of UV-visible spectra. General features of absorption – spectroscopy, transmittance, absorbance, and molar absorptivity. Beer Lambert's law and its limitations.

Unit II: NMR and Mass Spectrometry **15Hrs**

S5-E-A-II: Proton Magnetic Resonance Spectroscopy

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, factors affecting chemical shifts, NMR splitting of signals – spin-spin coupling, representation of proton NMR spectrum – Integrations. ^{1}H NMR spectrum of – ethyl bromide, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate and acetophenone.

Mass Spectrometry

Electron Impact Mass: Basic principles, Nitrogen rule, types of ions: Molecular ion and fragment ions. Representation of mass spectrum, types of peaks (molecular ion peak, base peak and isotopic ion peaks). Determination of molecular formula. Mass spectrum of ethyl chloride, ethyl bromide and acetophenone.

Unit III: Separation techniques - I **15Hrs**

S5-E-A-III: Solvent Extraction- Principle, Methods of extraction: Batch extraction, continuous extraction and counter current extraction. Application – Determination of Iron(III).

Chromatography: Classification of chromatographic methods, principles of differential migration, adsorption phenomenon, nature of adsorbents, solvent systems.

Thin layer Chromatography (TLC): Advantages, preparation of plates, Solid phase and mobile phase used in TLC, eluotopic series, development of the chromatogram, Detection of the spots, visualizing agents, factors effecting Rf values and applications of TLC.

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Paper Chromatography: Principle, choice of paper and solvent systems, development of chromatogram – ascending, descending, radial and two dimensional chromatography, detection of spots, and applications of paper chromatography.

15Hrs

Unit IV: Separation techniques - II

S5-E-A-IV: Column Chromatography- Principle, Types of stationary phases, Column packing – Wet packing technique, Dry packing technique. Selection criteria of mobile phase solvents for eluting polar, non-polar compounds and its applications.

Ion exchange chromatography: Principle, cation and anion exchange resins, its application in separation of ions, de-ionized water.

Gas Chromatography: Principle, theory and instrumentation (Block Diagram), Types of stationary phases and carrier gases (mobile phase), applications of GC.

High performance liquid chromatography: Principle, theory and instrumentation, stationary phases and mobile phases. Applications of HPLC, Analysis of paracetamol.

Recommended Text Books and Reference Books

1. Fundamentals of Molecular Spectroscopy, Banwell & McCash
2. Organic spectroscopy, William Kemp, Palgrave Macmillan; 2nd Revised edition
3. Spectroscopy, B K Sharma Krishna Prakashan Media, 1981
4. Elements of Organic Spectroscopy, Y R Sharma.
5. Applications of Absorption Spectroscopy of Organic Compounds (English, Paperback, Dyer R. John)
6. Organic Chemistry, Morrison and Boyd, Pearson Publications.
7. Introduction to Spectroscopy by Donald Pavia, Gary Lampman and George Kriz. Saunders College Division,2001
8. Chemistry text book for B.Sc., published by Telugu Academy, Govt. of Telangana.
9. Analytical Chemistry by David Krupadanam, Universities Press (India) Limited.
10. Principles of Instrumental Analysis, D.A. Skoog, F.J. Holler, T.A. Nieman, Engage earning India Ed.
11. Fundamentals of Analytical Chemistry 6 th Ed., D. A. Skoog, D.M. West, F.J. Holler, Saunders College Publishing, Fort worth (1992).
12. Instrumental Methods of Analysis. 7th Ed. Willard, H.H., Merritt, L.L., Dean, J. & Settle, F.A. Wordsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
13. A Textbook of Quantiitative Inorganic Analysis 7th Ed., Vogel, A. I. Prentice Hall.
14. Analytical Chemistry 7 th edition by Gary D. Christian (2004).
15. Separation Methods, M.N Sastry, Himalaya Publication (2004).

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B.Sc. Chemistry III Year
Semester-V, Paper- V
Discipline Specific Elective-B (4 Credits)
Metallurgy, Dyes and Catalysis **60 Hrs**

Unit I: General Principles of Metallurgy and Production of Non Ferrous Metals **15 Hrs**

S5-E-B-I: Pyrometallurgy: Drying and calcination, roasting, smelting, products of smelting.
Hydrometallurgy: Leaching methods, leaching agents, leaching of metals, oxides and sulphides.
Separation of liquid and solid phases and processing of aqueous solutions
Electrometallurgy: Electrolysis, Refining electrolysis, electrolysis from aqueous solutions, fused-salt electrolysis
Refining processes: Chemical and physical refining processes
Production of selected non-ferrous metals (Copper, Nickel, Zinc): Properties, raw materials, production (flow charts presentations and chemical reactions involved) and uses.

Unit II: Natural and Synthetic Dyes **15Hrs**

S5-E-B-II: Dyes: Definition, Classification of dyes- Natural dyes, synthetic dyes; based on chemical constitution of dyes; Chemical nature of dyes; Applications of dyes.
Stuctures of natural dyes: Indigo, Tyrian purple, Alizarin, Indigotin.
Structures of Synthetic Dyes: Nitrodyes, Nitrosodyes, Azodyes (Mono azodyes, bisazodyes), diaryl methane dyes, triaryl methane dyes, Xanthene dyes, Phenolphthalein, Fluorocein, Acridine dyes.
Synthesis of dyes: Mono azodyes, bisazodyes (Congo red), Auromine O, Malachite Green, Crystal Violet, Rhodamine B, Acridine Yellow, Indigotin .
Binding of dyes to fabric. Applications of dyes.

Unit III: Catalysis I **15Hrs**

S5-E-B-III: Homogeneous and heterogeneous catalysis -
Definition of a catalyst and catalysis. Comparison of homogeneous and heterogeneous catalysis with specific examples. General characteristics of catalytic reactions.
Acid-base catalysis- Examples of acid and base catalysed reactions, hydrolysis of esters.
Kinetics of acid catalysed reactions. Specific acid and general acid catalysis, Kinetics of base catalysed reactions. Specific base and general base catalysis. Examples-Aldol condensation and decomposition of nitramide, base catalysed conversion of acetone to di acetone alcohol. Mutarotation of glucose. Effect of pH on reaction rate of acid and base catalysed reactions.
Phase transfer catalysis: Principle of phase transfer catalysis, classification of phase transfer catalysts. Factors influencing the rate of PTC reactions.

Unit IV: Catalysis II **15Hrs**

S5-E-B-IV: Enzyme catalysis- Characteristics of enzyme catalysis, Examples: (i) Invertase in inversion of cane sugar (ii) Maltase in conversion of maltose to glucose (iii) Urease in decomposition of urea (iv) Zymase in conversion of glucose to ethanol (v) working of carbonic anhydrase and (vi) Mechanism of oxidation of ethanol by alcohol dehydrogenase Factors affecting enzyme catalysis. Effect of temperature, pH, concentration and effect of inhibitor on enzyme catalysed reactions, Catalytic efficiency.

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Kinetics of enzyme catalysed reactions: Michaelis-Menton Equation. Mechanism of enzyme catalysed reactions. Significance of Michaelis constant (Km) and maximum velocity (Vmax), Lineweaver-Burk plot. Types of enzyme inhibitors

Recommended Text Books and Reference Books

1. Industrial Chemistry, B K Sharma
2. Engineering Chemistry, Jain and Jain
3. Industrial Chemistry E. Stocchi, Vol-I, Ellis Horwood Ltd. UK.
4. Handbook of Industrial Chemistry, J. A. Kent: Riegel's, CBS Publishers, New Delhi.
5. Theory of production of non- ferrous metals and alloys Study. Kateřina Skotnicová, Monika Losertová, Miroslav Kursa
6. The Chemistry of Synthetic Dyes, Volume 4, K Venkataraman Elsevier
7. Organic Chemistry Vol-I by I.L. Finar.
8. Organic Chemistry by Jennice, Gorzinski Smith
9. Natural Dyes: Sources, Chemistry, Application and Sustainability Issues by Sujata Saxena and A. S. M. Raja.
10. Physical Chemistry by Atkins and De Paula, 8 th Edn.
11. Physical Chemistry by Puri, Sharma and Pattania, 2017.
12. Kinetics and mechanism of chemical transformations by Rajarajm and Kuraiacose, Published by Macmillan India Ltd.
13. Text book of Physical Chemistry, K.L. Kapoor, Macmillan, 1999.
14. Catalysis, J.C. Kuriacose, Macmillan Macmillan Publishers India Limited, 1980.
15. Phase Transfer Catalysis, Fundamentals, Applications and Industrial perspective, C. M. Stark, C. Liotta & M. Halpern, Academic Press
16. Phase Transfer Catalysis, E. V. Dehmlow & S. S. Dehmlow, Verlag Chemie, Weinheim

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Semester - V
Laboratory Course
Paper V Experiments in Physical Chemistry-I

45 h (3 h / w)

1. Distribution law
   a) Determination of molecular status and partition coefficient of benzoic acid in Toluene and water.
   b) Determination of distribution coefficient of acetic acid between n-butanol and water.

2. Electrochemistry
   a) Determination of cell constant of a conductivity cell.
   b) Verification of Ostwald's dilution law- Determination of dissociation constant (K_a) of acetic acid by conductivity measurements.

3. Colorimetry
   a) Verification of Beer's law using $KMnO_4$
   b) Determination of the concentration of the given $KMnO_4$ solution.

4. Adsorption
   b) Adsorption of acetic acid on animal charcoal - Verification of Freundlich adsorption isotherm.

5. Physical constants
   a) Surface tension and b) viscosity of liquids. (Demonstration Experiment)

Reference books:

1. Senior practical physical chemistry. B. D. Khosla, V.C. Garg, Adarsh Gulati Published by R. Chand & Co.
2. Practical Physical Chemistry: B. Vishwanathan and P.S. Raghavan. Viva Books
3. Practicals in Physical Chemistry by P.S. Sindhu ISBN-10: 1-4039-2916-5 / 1403929165 ISBN-13: 978-1-4039-2916-7 / 9781403929167

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B.Sc. Chemistry III Year
Semester –VI
Optional for Chemistry Stream
Advanced Chemistry **60Hrs**

Unit-I (Inorganic Chemistry) **15 Hrs**

S6-O-I-1:Inorganic reaction mechanisms **4h**

Labile and inert complexes, Thermodynamic and kinetic stability based on VBT & CFT: ligand substitution reactions –S_{N^1} and S_{N^2} in Octahedral complexes; substitution reactions of square planar complexes – Trans effect and applications of trans effect. Reactions of tetrahedral complexes - Hydrolysis of silicon halides and phosphorous oxides.

S6-O-I-2: Boranes and Carboranes **2 h**

Definition of clusters. Structures of boranes and carboranes- Wade's rules, closo, nido, arachno boranes and carboranes

S6-O-I-3: Symmetry of molecules **5 h**

Symmetry operations and symmetry elements in molecules. definition of axis of symmetry types of c_n, plane of symmetry (σ_h, σ_v, σ_d), center of symmetry and improper rotational axis of symmetry (S_n). Explanation with examples.

S6-O-I-4: Non – aqueous solvents **4 h**

Classification and characteristics of a solvent. Reactions in liquid ammonia – physical properties, auto-ionisation, examples of ammono acids and ammono bases. Reactions in liquid ammonia – precipitation, neutralization, solvolysis, solvation - solutions of metals in ammonia, complex formation, redox reactions. Reactions in HF – autoionisation, reactions in HF – precipitation, acid – base reactions, protonation.

Unit-II (Organic Chemistry) **15 Hrs**

S6-O-O-1: Pericyclic Reactions **5 h**

Concerted reactions, Molecular orbitals of ethene, 1,3-butadiene and allyl radical. Symmetry properties, HOMO, LUMO, thermal and photochemical pericyclic reactions. Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each and their explanation by FMO theory.

S6-O-O-2: Synthetic Strategies **5 h**

Terminology – Target molecule (TM), Disconnection approach – Retrosynthesis, Synthon, Synthetic equivalent (SE), Functional group interconversion (FGI), Linear, Convergent synthesis. Retrosynthetic analysis of the following molecules: 1) acetophenone 2) cyclohexene and 3) 2-phenylethanol.

S6-O-O-3: Asymmetric synthesis **5 h**

Definition and classification of stereoslective reactions: substrate, product stereoselective reactions, enantio and diastereo selective reactions. Stereospecific reaction – definition –example – dehalogenation of 1,2-dibromides induced by iodide ion. Enantoselective reactions – definition – example –Reduction of Ethylacetoacetate by Yeast. Diastereoselective reaction- definition-

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example:Acid catalysed dehydration of 1-phenylproponal and Grignard addition to 2-phenyl propanal. Definition and explanation of enantiomeric excess and diastereomeric excess.

Unit III (Physical Chemistry) **15 Hrs**

S6-O-P--1: Polymers

Definition of polymers – natural polymers and synthetic polymers examples classification as plastics, fibers, elastomers.

Thermosetting, thermoplastic polymers. Branched, cross-linked and co-polymers.

Definition of polymerization-addition and condensation polymerization with examples. Explanation :chain polymerization, step polymerization, co-polymerization and co-ordination polymerization. Kinetics of free radical polymerization. Tacticity, atacticity, stereo specific synthesis- Zeigler- Natta catalyst.

Molecular weight definitions- number average, weight average molecular weight. Determination of molecular weight of polymers using viscosity method, Osmometric method. Problems.

Preparation and industrial applications of polyethylene, poly vinyl chloride (PVC), nylon –66, teflon, polyacrylonitrile and terelene.

Introduction to biodegradability and examples of biodegradable polymers.

Unit IV: (General Chemistry) **15 Hrs**

S6-O-G--1:: Electroanalytical methods

Types of Electroanalytical Methods.

I) Interfacial methods – a) Potentiometry: Principle, Electrochemical cell, Electrodes- (i) Indicator and (ii) Reference electrodes – Normal Hydrogen Electrode, Quinhydrone Electrode, Saturated Calomel Electrode. Numerical Problems. Application of Potentiometry – Assay of Sulphanilamide

b) Voltametry – three electrode assembly; Intoduction to types of voltametric techniques, micro electrodes, Over potential and Polarization.

II) Bulk methods – Conductometry, Conductivity Cell, Specific Conductivity, Equivalent Conductivity. Numerical Problems. Applications of conductometry. Estimation of Cl – using $AgNO_3$. Determination of Aspirin with KOH.

Recommended Text Books and Reference books

1. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3 rd edn Wiley Publishers (2001).
2. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4 th edn. (2006)
3. Inorganic Chemistry by Shriver and Atkins 3 rd edn Oxford Press (1999).
4. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications (1996).
5. Symmetry and Spectroscopy of Molecules, K. Veera Reddy, Second Edition, New Age International (P) Limited Publishers
6. Textbook of Inorganic Chemistry by R Gopalan, Universities Press,(2012)
7. Text book of organic chemistry by Morrison and Boyd, Pearson Publishers (2009)
8. Text book of organic chemistry by Graham Solomons, Wiley(2015)

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9. Fundamentals of organic synthesis and retrosynthetic analysis by Ratna Kumar Kar, NCBA,(2014)
10. Organic synthesis by Dr. Jagadamba Singh and Dr. L.D.S. Yadav, Pragati Prakashan, 2010
11. Stereochemistry of organic compounds by D. Nasipuri, New Academic Science Limited, 2012
12. Organic chemistry by Clayden, Greeves, Warren and Wothers, Oxford University Press, 2001
13. Fundamentals of Asymmetric Synthesis by G. L. David Krupadanam, Universities Press(2014)
14. Polymer Chemistry, M G Arora and M Singh
15. Introductory Polymer Chemistry by G S Misra
16. Textbook of Polymer Science, F. W. Billmeyer Jr, John Wiley & sons
17. Polymer Science, V. R. Gowarikar, N. V. Viswanathan & J. Sreedhar, Wiley Eastern
18. Contemporary Polymer Chemistry, H. R. Alcock & F. W. Lambe, Prentice Hall
19. Materials Science and Engineering An Introduction by William D. Callister, Jr. John Wiley & Sons, Inc.
20. Principles of Instrumental Analysis, D.A. Skoog, F.J. Holler, T.A. Nieman, Engage earning India Ed.
21. Fundamentals of Analytical Chemistry 6 th Ed., D. A. Skoog, D.M. West, F.J. Holler, Saunders College Publishing, Fort worth (1992).
22. Physical Chemistry by Atkins and De Paula, 8 th Edn.
23. Physical Chemistry by Puri, Sharma and Pattania, 2017

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B.Sc. Chemistry III Year
Semester-VI, Paper-VI
Discipline Specific Elective-A (4 Credits) **60Hrs**
Medicinal Chemistry

15Hrs

Unit- I:Introduction and Terminology

S6-E-A-I: Diseases: Common diseases, infective diseases–insect borne, air-borne, water-borne and hereditary diseases.

Terminology in Medicinal Chemistry: Drug, Active Pharmaceutical Ingredient (API), Pharmaceuticals, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics, metabolites, anti metabolites and therapeutic index.

Drugs: Nomenclature: Chemical name, Generic name and Trade names with examples; Classification: Classification based on structures and therapeutic activity with examples.

ADMET: a) Absorption: Definition, absorption of drugs across the membrane – active and passive absorption, routes of administration of drugs. b) Distribution: definition and effect of plasma protein binding. c) Metabolism: definition, phase I and phase II reactions.
d) Elimination: definition and renal elimination. Toxicity.

15Hrs

Unit-II: Enzymes and Receptors

S6-E-A-II: Enzymes: Introduction. Mechanism and factors affecting enzyme action, Specificity of enzyme action (including stereo specificity), Enzyme inhibitors and their importance. Types of inhibition - reversible, irreversible and their subtypes with examples.

Receptors: Introduction, Drug action-receptor theory, Mechanism of drug action, concept of agonists and antagonists with examples. Drug receptor interactions involved in drug receptor complex. binding role of –OH group, $-NH_2$ group, quaternary ammonium salts and double bond. Structure – activity relationships of drug molecules, explanation with sulfonamides.

Unit- III: Synthesis and Therapeutic Activity of Drugs **15Hrs**

S6-E-A-III: Introduction, synthesis and therapeutic activity of
Chemotherapeutics: Sulphanilamide, dapsone, Pencillin-G (semi synthesis), Chloroquin, Isoniazid, Cisplatin and AZT.

Drugs to treat metabolic disorders: Anti diabetic - Tolbutamide; Antiinflammatory – Ibuprofen; Cardiovascular- Glyceryl trinitrate; Antipyretic (paracetamol, aspirin) and Antacid- Omeprazole.

Drugs acting on nervous system: Anesthetics-definition, Classification-local and general. Volatile- Nitrous oxide, chloroform uses and disadvantages. Local anaesthetics – benzocaine.

Unit- IV: Molecular Messengers, Vitamins and Micronutrients **15Hrs**

S6-E-A-IV: Molecular Messengers: Introduction to hormones and neurotransmitters, Thyroid hormones, Antithyroid drug-Carbimazol. Adrenaline: Adrenergic drugs- salbutamol, atenelol. Serotonin: SSRIs- fluoxetine. Dopamine: Antiparkinson drug- Levodopa .

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Vitamins and Micronutrients: Introduction, vitamin sources, Deficiency disorders and remedy of Vitamins A,B, C, D, E K and micronutrients – Na, K, Ca, Cu, Zn and I .

Recommended Text Books and Reference books

1. Introduction to Medicinal Chemistry, G.L. Patrick, Oxford University Press, New York. 2013.
2. Medicinal Chemistry, Thomas Nogrady, Oxford Univ. Press, New York.2005.
3. Foye's Principles of Medicinal Chemistry, David William and Thomas Lemke, Lippincott Williams & Wilkins, 2008.
4. Medicinal Chemistry, Ashutosh Kar , New Age International, 2005.
5. Synthetic Drugs, O.D.Tyagi & M.Yadav, Anmol Publications,1998.
6. Medicinal Chemistry, Alka L. Gupta, Pragati Prakashan.
7. Drugs, G. L. David Krupadanam, D.Vijaya Prasad, K.Varaprasad Rao, K. L. N. Reddy, C. Sudhakar, Universities Press (India) Ltd. 2012.

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B.Sc. Chemistry III Year
Semester –VI, Paper-VI
Discipline Specific Elective-B (4 Credits)
Agricultural and Fuel Chemistry **60 Hrs**

Unit I: – Pesticides **15Hrs**

S6-E-B-I: Introduction, Definition, classification of pesticides based on use (target). Toxicity and chemical structure with examples. Adverse effects of pesticides and its impact on environmental pollution.

Synthesis, manufacture and uses of representative pesticides: Organochlorines (Cypermethrin); Organophosphates (Parathion); Carbamates (Carbaryl); Quinones(Chloranil), Anilides(Alachlor).

Pesticide formulations: Dusts, Granules, Wettable powders, Emulsions and Aerosols.

Biopestcides : Introduction: Potential pesticidal plants of India, Role of Neem in plant protection-constituents, Azadirachtin and its role in pest control, Structure and mode of action of Pyrethrins(pyrethrin-1) and Pyrethroids (permethrin) and nicotinoids (Imidacloprid).

Unit II: – Fertilizers **15Hrs**

S6-E-B-II: Introduction: (need of fertilizers), functions of essential plant nutrients (N, P, K), Classification formula and uses of fertilizers:

Nitrogenous fertilizers: Ammonium nitrate, Urea, Calcium Cyanamide, Calcium Ammonium Nitrate, Sodium Nitrate, Ammonium Chloride and their uses.

Phosphate fertilizers: Normal super phosphate, Triple Super Phosphate, Ammonium Phosphate and their uses.

Potassium fertilizers: Potassium chloride, potassium nitrate, potassium sulphate and uses. Complex fertilizers: Diammonium Phosphate and mixed fertilizers their uses. Manufacture of urea and Super phosphate of lime and their reactions in the soil.

Biofertilizers – Introduction, definition, classification, Rhizobium, Azatobactor, Azospirillium, Azolla, Blue Green Algae, Vermicomposting and uses.

Organic farming: The principal methods, crop rotation, green manures and compost, biological pest control, and mechanical cultivation and uses.

Unit III: Energy Sources and Coal **15Hrs.**

S6-E-B-III: Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.

Coal: Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar based chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Unit IV: Petroleum and its products, petrochemicals and non petroleum fuels **15Hrs.**

S6-E-B-IV:

Petroleum and its products

Petroleum: Origin, Composition of crude petroleum and classification. Properties- flash point and its determination, Knocking and antiknocking compounds; Octane number. and Cetane number. Distillation of crude petroleum, Fractional Distillation - Principle and process, refining, Fractions and uses. Cracking -Thermal and catalytic cracking, Reforming

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Petroleum products – Petrol, Diesel, LPG, Kerosene, Tar and their applications.
Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene and their uses.
Lubricants: Classification of lubricants- Solid, semisolid and liquids; Properties (viscosity, flash point, fire point, cloud point, pour point) and their determination. Functions of lubricants. Mechanism of lubrication.
Non-petroleum fuels: Natural Gas-CNG, LNG, Clean Fuels-H_2 gas, ethanol, Fuel from waste - bio-gas, Fuel from biomass –bio-ethanol, biodiesel, Synthetic fuels- syngas based.

Recommended Text Books and Reference books

1. Chemistry of pesticides, N. N. Melnikov, Springer-Verlag- Technology & Engineering (2012).
2. Pesticide Synthesis Handbook, Thomas A. Unger, Elsevier, (2000).
3. Pesticides, R. Cremlyn, John Wiley, 1980.
4. Manures and Fertilisers, K. Kolay, Published by Atlantic (2007).
5. Sharma, B.K. & Gaur, H. Industrial Chemistry, Goel Publishing House, Meerut (1996).
6. A Text Book of Engineering Chemistry Paperback – 2017 by Shashi Chawla
7. Industrial Chemistry, Vol-I, Stocchi, E, Ellis Horwood Ltd. UK (1990).
8. Jain, P.C. and Jain, M. Engineering Chemistry Dhanpat Rai & Sons, Delhi.
9. Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Sons, Delhi.

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Semester - VI
Laboratory course
Paper VI Experiments in Physical Chemistry-II

45h (3 h/w)

1. Kinetics

a) Determination of specific reaction rate of the hydrolysis of methyl acetate catalyzed by hydrogen ion at room temperature.
b) Determination of rate of decomposition of hydrogen peroxide catalyzed by $FeCl_3$.

2. Electrochemistry

A. Potentiometry:

a) Determination of redox potential of Fe^{2+}/Fe^{3+} by potentiometric titration of ferrous ammonium sulphate vs. potassium dichromate.
b) Precipitation titration of KCl vs. $AgNO_3$ -Determination of given concentration of silver nitrate.

B. pH metry:

a) pH metric titration of strong acid (HCl) vs. strong base- Determination of the concentration of the given acid.
b) pH metric titration of weak acid(acetic acid) with strong base(NaOH).- Determination of acid dissociation constant (K_a) of weak acid.

3. Conductometry:

a) Determination of overall order: Saponification of ethyl acetate with NaOH by conductance measurements.

Reference books:

1. Senior practical physical chemistry. B. D. Khosla, V.C. Garg, Adarsh Gulati
2. Advanced Practical Physical chemistry: J.B.Yadav
3. Practical Physical Chemistry: B. Vishwanathan and P.S. Raghavan.
4. Practical in Physical Chemistry: P.S. Sindhu

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B.Sc. Chemistry III Year
SEMESTER-VI, PAPER-VI
Discipline Specific Elective-A
Medicinal Chemistry

Drug analysis: Concept, Drug stability, Chemical reactions that cause drug degradation, Analytical methods of Drug analysis: Spectrophotometric methods, Chromatographic methods, Quality assurance and quality control, Method validation and statistical interpretation of the analytical Method.

References:

8. Blass B. Basic Principles of Drug Discovery and Development. 1st ed. Amsterdam: Academic Press; 2015
9. Cairns D. Essentials of Pharmaceutical Chemistry. 3rd ed. UK: Pharmaceutical Press; 2008
10. Jeffery GH, Bassett J, Mendham J, Denney RC. Vogel's Textbook of Quantitative Chemical Analysis. 5th ed. England, UK: Longman Scientific and Technical; 1989

B.Sc. Chemistry II Year
SEMESTER-IVI, PAPER-IV

Chemistry of Beverages: Introduction of beverages, Types of beverages Carbonated, non-carbonated and alcoholic beverages, chemical constituents of beverages: Water, Acidulents, Flavourings, Colours, Preservatives, stabilizers, saponins, Sweetners, Antioxidants and Calcium disodium EDTA, Analysis of soft drinks and fruit juices

Reference:

Philip R. Ashurst, Chemistry and Technology of Soft Drinks & Fruit juices, 3rd ed. Wiley Blackwell, 2016.

B.Sc. Chemistry I Year
SEMESTER-II, PAPER-II

Water Chemistry: Elements, radicals, and compounds Chemical water analysis, pH calculations,Gas solubility, Alkalinity, Colloids and coagulation Organic compounds Organic matter in wastewater, Laboratory chemical analyses. Physico-Chemical parameters of water: Characteristics of drinking water, Chemical composition of Drinking water, Chemical quality of drinking water and water quality standards. Water pollution: Concept of water-pollution, potential water pollutants, impact of industrial effluents on water pollution. Water treatment: Domestic and municipal water treatments, RO-systems, natural methods of water treatments. Types of hardness, Boiler troubles and Boiler water treatment.

Reference:

Trivedi, P. K. and Goel, P. K., chemical and biological method for water pollution studies. Env. Publication, Karad (1986).

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Mathematics

Syllabus Revision for the year : 2017-18

Sl. No.	Programme	Year	Semester	Number of Courses having changes	Remarks
1	B.Sc. Mathematics	I	I	NIL	
2	B.Sc. Mathematics	I	II	NIL	
3	B.Sc. Mathematics	II	III	12	B.Sc. Mathematics – III syllabus revised as CBCS implemented --
4	B.Sc. Mathematics	II	IV	12	-- B.Sc. Mathematics – IV syllabus revised as CBCS implemented
5	B.Sc. Mathematics	III	NA	NIL	
6	M. Sc Mathematics	I	I	NIL	
7	M. Sc Mathematics	I	II	NIL	
8	M.Sc Mathematics	II	III	4	Syllabus was revised as CBCS implemented
9	M.Sc Mathematics	II	IV	4	Syllabus was revised as CBCS implemented
	Total			32	

Total Number of courses : 62

Total Number of courses having changes: 32

Percentage of Revision : 51.61

PG: 08/16 UG : 24/46

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Mathematics

Syllabus Revision for the year : 2018-19

Sl. No.	Programme	Year	Semester	Number of Courses having changes	Remarks
1	B.Sc. Mathematics	I	I	NIL	
2	B.Sc. Mathematics	I	II	NIL	
3	B.Sc. Mathematics	II	III	NIL	
4	B.Sc. Mathematics	II	IV	NIL	
5	B.Sc. Mathematics	III	V	12	B.Sc. Mathematics –V syllabus revised as CBCS implemented
6	B.Sc. Mathematics	III	VI	12	B.Sc. Mathematics –VI syllabus revised as CBCS implemented
7	M.Sc Mathematics	I	I	5	Syllabus was revised
8	M.Sc Mathematics	I	II	5	Syllabus was revised
9	M.Sc Mathematics	II	III	NIL	
10	M.Sc Mathematics	II	IV	NIL	
	Total			34	

Total Number of courses : 78

Total Number of courses having changes: 34

Percentage of Revision : 43.58

PG:10/18 UG :24/60

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Mathematics

Syllabus Revision for the year : 2019-20

Sl. No.	Programme	Year	Semester	Number of Courses having changes	Remarks
1	B.Sc. Mathematics	I	I	5	B.Sc. Mathematics –I syllabus revised
2	B.Sc. Mathematics	I	II	5	B.Sc. Mathematics – II syllabus revised
3	B.Sc. Mathematics	II	III	NIL	
4	B.Sc. Mathematics	II	IV	NIL	
5	B.Sc Mathematics	III	V	NIL	
6	B.Sc. Mathematics	III	VI	NIL	
7	M.Sc Mathematics	I	I	NIL	
8	M.Sc Mathematics	I	II	NIL	
9	M.Sc Mathematics	II	III	5	Syllabus was revised
10	M.Sc Mathematics	II	IV	5	Syllabus was revised
	\Total			20	

Total Number of courses : 78

Total Number of courses having changes: 20

Percentage of Revision : 25.64

PG : 10/20 UG : 10/58

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TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

Mathematics

Syllabus Revision for the year : 2020-21

Sl. No.	Programme	Year	Semester	Number of Courses having changes	Remarks
1	B.Sc. Mathematics	I	I	NIL	
2	B.Sc. Mathematics	I	II	NIL	
3	B.Sc. Mathematics	II	III	10	B.Sc. Mathematics – III syllabus revised
4	B.Sc. Mathematics	II	IV	10	B.Sc. Mathematics – IV syllabus revised
5	B.Sc Mathematics	III	V	NIL	
6	B.Sc. Mathematics	III	VI	NIL	
7	M.Sc Mathematics	I	I	NIL	
8	M.Sc Mathematics	I	II	NIL	
9	M.Sc Mathematics	II	III	NIL	
10	M.Sc Mathematics	II	IV	NIL	
	Total			20	

Total Number of courses : 54

Total Number of courses having changes: 20

Percentage of Revision : 37.03

UG : 20/54 PG: 0

Principal

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Mathematics

Syllabus Revision for the year : 2021-22

Sl. No.	Programme	Year	Semester	Number of Courses having changes	Remarks
1	B.Sc Mathematics	I	I	NIL	
2	B.Sc. Mathematics	I	II	NIL	
3	B.Sc. Mathematics	II	III	NIL	
4	B.Sc. Mathematics	II	IV	NIL	
5	B.Sc. Mathematics	III	V	10	B.Sc. Mathematics – V syllabus revised
5	B.Sc. Mathematics	III	VI	10	B.Sc. Mathematics – VI syllabus revised
6	M.Sc Mathematics	I	I	NIL	
7	M.Sc Mathematics	I	II	NIL	
8	M.Sc Mathematics	II	III	NIL	
9	M.Sc Mathematics	II	IV	NIL	
	Total			20	

Total Number of courses : 54

Total Number of courses having changes: 20

Percentage of Revision : 37.03

Principal

UG : 20/54 PG: 0

Principal

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TARA GOVERNMENT COLLEGE (A), Sangareddy
Department of Physics

2016-17

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc	I	I	3	Introduced CBCS
2	B.Sc	I	II	3	Introduced CBCS
3	B.Sc	II	NA	Nil	Nil
4	B.Sc	III	NA	Nil	Nil
5	M.Sc	I	I	4	Introduced CBCS
6	M.Sc	I	II	4	Introduced CBCS
Total				14	

Total No. of Courses: 25
Total No. of Courses having changes: 14
Percentage of revision: 56 %

P.R. Ratan Kumar, M.Sc., M.Tech.
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2017-18

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc	I	I	Nil	Nil
2	B.Sc	I	II	Nil	Nil
3	B.Sc	II	III	3	Introduced CBCS
4	B.Sc	II	IV	3	Introduced CBCS
5	B.Sc	III	NA	Nil	Nil
6	M.Sc	I	I	Nil	Nil
7	M.Sc	I	II	Nil	Nil
8	MSc	II	III	4	Introduced CBCS
9	MSc	II	IV	4	Introduced CBCS
Total				14	

Total No. of Courses: 36
Total No. of Courses having changes: 14
Percentage of revision: 38.8 %

P.R. Ratan Kumar, M.Sc., M.Tech.
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2018-19

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc	I	I	Nil	Nil Paper-I Mechanics
2	B.Sc	I	II	Nil	Nil Waves and Optics Naher
3	B.Sc	II	III	Nil	Nil Thermodynamics
4	B.Sc	II	IV	Nil	Nil
5	B.Sc	III	V	6	Introduced CBCS Electromagnetics Chapters SSP changed
6	B.Sc	III	VI	6	Introduced CBCS
7	M.Sc	I	I	Nil	Nil
8	M.Sc	I	II	Nil	Nil
9	MSc	II	III	Nil	Nil
10	MSc	II	IV	Nil	Nil
Total				12	

Total No. of Courses: 42
Total No. of Courses having changes: 12
Percentage of revision: 28.5 %

P R Ratan Kumar
P.R. Ratan Kumar, M.Sc., M.Tech.
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TARA GOVT. COLLEGE

2019-20

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc	I	I	3	Introduced Course MPS
2	B.Sc	I	II	3	Introduced Course MPS
3	B.Sc	II	III	Nil	Nil
4	B.Sc	II	IV	Nil	Nil
5	B.Sc	III	V	Nil	Nil
6	B.Sc	III	VI	Nil	Nil
7	M.Sc	I	I	4	
8	M.Sc	I	II	4	
9	MSc	II	III	Nil	Nil
10	MSc	II	IV	Nil	Nil
Total				14	

Total No. of Courses: 44
Total No. of Courses having changes: 14
Percentage of revision: 31.81 %

P R Ratan Kumar
P.R. Ratan Kumar, M.Sc., M.Tech.
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2020-21

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc	I	I	Nil	Nil
2	B.Sc	I	II	Nil	Nil
3	B.Sc	II	III	3	Introduced Course MPS
4	B.Sc	II	IV	3	Introduced Course MPS
5	B.Sc	III	V	Nil	Nil
6	B.Sc	III	VI	Nil	Nil
7	M.Sc	I	I	Nil	Nil
8	M.Sc	I	II	Nil	Nil
9	MSc	II	III	4	
10	MSc	II	IV	4	
Total				14	

Total No. of Courses: 40
Total No. of Courses having changes: 14
Percentage of revision: 35 %

P.R. Ratan Kumar, M.Sc., M.Tech.
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2016 - 17

B.Sc. (Physics)Semester I-Theory Syllabus

Paper – I :: Mechanics

48 hrs (4 hrs / week)

Unit – I

1. Vector Analysis (12)

Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field and related problems. Vector integration, line, surface and volume integrals. Stokes, Gauss and Greens theorems- simple applications.

Unit – II

2. Mechanics of Particles (12)

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section.

3. Mechanics of rigid bodies (12)

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Euler's equation, precession of a top, Gyroscope.

Unit – III

4. Central Forces (12)

Central forces – definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.

Unit – IV

5. Special theory of relativity (12)

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation. Concept of four vector formalism.

NOTE: Problems should be solved at the end of every chapter of all units.

Textbooks

1 Berkeley Physics Course. Vol.1, **Mechanics** by C. Kittel, W. Knight, M.A. Ruderman - *Tata-McGraw hill Company Edition 2008.*
2 **Fundamentals of Physics**. Halliday/Resnick/Walker *Wiley India Edition 2007.*
3 **First Year Physics** - *Telugu Academy.*
4 **Introduction to Physics for Scientists and Engineers**. F.J. Ruche. *McGraw Hill.*

Reference Books

1. **Fundamentals of Physics** by Alan Giambattista et al *Tata-McGraw Hill Company* Edition, 2008.
2. **University Physics** by Young and Freeman, *Pearson Education, Edition 2005.*
3. **Sears and Zemansky's University Physics** by Hugh D. Young, Roger A. Freedman *Pearson Education Eleventh Edition.*
4. **An introduction to Mechanics** by Daniel Kleppner & Robert Kolenkow. *The McGraw Hill Companies.*
5. **Mechanics**. Hans & Puri. *TMH Publications.*
6. **Engineering Physics**. R.K. Gaur & S.L. Gupta. *Dhanpat Rai Publications.*
7. R P Feymman, RB Lighton and M Sands - The Feymman Lectures in Physics, Vol.-1, BI Publications,
8. J.C. Upadhyay - Mechanics.
9. P.K. Srivastava - Mechanics, New Age International.

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Ch. Aliveni

(3 hrs / week) 36 hrs

FIRST SEMISTER PRACTICALS

Practical

Paper – I :: Mechanics

1. Study of a compound pendulum determination of 'g' and 'k'.
2. Y' by uniform Bending
3. Y by Non-uniform Bending.
4. Moment of Inertia of a fly wheel.
5. Measurement of errors –simple Pendulum.
6. 'Rigidity moduli by torsion Pendulum.
7. Determine surface tension of a liquid through capillary rise mehod.
8. Determination of Surface Tension of a liquid by different methods.
9. Determine of Viscosity of a fluid.
10. Calculation of slope and intercept of a Y= mX +C by theoretical method

Note: Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week.

Text and reference books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (Pragati Prakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
   "Practical Physics" R.K Shukla, Anchal Srivastava

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B.Sc. (Physics)Semester II-Theory Syllabus

Paper – II :: Waves and Oscillations

48 hrs
(4 hrs / week)

Unit – I

1. Fundamentals of vibrations(12)

Simple harmonic oscillator, and solution of the differential equation– Physical characteristics of SHM, torsion pendulum, - measurements of rigidity modulus , compound pendulum, measurement of 'g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures.

Unit – II

2. Damped and forced oscillations (12)

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance. Coupled Oscillators.

Unit – III

3. Vibrating Strings (12)

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones, energy transport, transverse impedance.

Unit – IV

4. Vibrations of bars(12)

Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

NOTE: Problems should be solved at the end of every chapter of all units.

36 hrs
(3 hrs / week)

SECOND SEMISTER PRACTICALS

Practical Paper – II :: Waves and Oscillations

1. Study of damping of an oscillating disc in Air and Water logarithmic decrement.
2. Study of Oscillations under Bifilar suspension.
3. Study of oscillations of a mass under different combination of springs.
4. Verification of Laws of a stretched string (Three Laws).
5. Determination of frequency of a Bar-Melde's experiment.
6. Observation of Lissajous figures from CRO.
7. Volume Resonator –determination of frequency of a tuning fork.
8. Velocity of Transverse wave along a stretched string.
9. Study of damping of a bar pendulum
10. Study of coupled oscillator.

Note: Minimum of eight experiments should be performed.Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week.

Text and reference books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (Pragati Prakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, Anchal Srivastava

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PG 2016-17

TARAGOVERNMENTCOLLEGE, SANGAREDDY
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DEPARTMENT OF PHYSICS

M.Sc. Physics I and II Semesters (CBCS) syllabus
(Revised Syllabus with effect from 2016-17)

Semester - I Syllabus

PAE 101 TPaper –I :: Mathematical Physics

UNIT –I: (13 Hrs**)**
Legendre's Differentialequation: ThePowerseriesequation:Solution–Legendre Functions of thefirst and second kind –Generating Function- Rodrigues'– OrthogonalFormulaProperties – Recurrence Relations. Beta and Gamma function – Properties –Relations between them.
Bessel's Differential Equation:Powerseries Solutionequation–BesselFunctions of First andSecond kind- Generating Function –Orthogonal Properties –Recurrence Relations.

UNIT –II: (13 Hrs**)**
Hermite Differential Equation : Power series Solution–Hermite polynomials - GeneratingFunction-Orthogonality –Recurrence relations -Rodrigues formula –Hyper geometric equation-solution-Laplace equation-Solution Wave equation and its applications to rectangular membrane.

UNIT –III : (13 Hrs**)**
Fourier Transform : Infinite Fourier Sine and Cosine transforms–Properties of Fouriertransforms-Derivative of Fourier transform –Fourier transform of a derivative-Fourier Sine and Cosine transform of derivatives-Finite Fourier transforms – Applications of Fourier Transforms.
Laplace Transform: Propertiesof Laplace transforms –Derivative of Laplace transform–Laplace transform of a derivative –Laplace transform of periodic functions- Inverse Laplace transform and its properties –Inverse Laplace theorem –Convolution theorem-Evaluation of inverse Laplace Transforms by Convolution theorem.

Unit –IV : (13 Hrs**)**
Matrices–Addition, subtraction and multiplication of matrices –Inverse of matrices-Characteristic equation of a matrix- eigen values- eigen vectors- Types of matrices-square, diagonal, unit symmetric and skew symmetricandHermitian matrices.
Tensors –Order and rank of the tensors –transformation laws Covariant and contra-variant tensors - Addition, subtraction and multiplication of tensors-Christoffel symbols of first and second rank and their transformation law.

Semester - I Syllabus

PAE 102 TPaper –II :: CLASSICAL MECHANICS

UNIT –I : (13 Hrs**)**

Newtonian formalism : Inertial frames and Galilean transforms-Non-inertial frames-pseudo forces, rotational frames, rotational transforms and conservation theorems.Description of rotations in terms of Eulerangles-Euler's equations of motion for a rigid body. Minkowski space, space-time diagrams, world point and world line-relativistic motion and Lorentz transforms as rotations in four-space, four velocity, energy-momentum vectors with few examples.

UNIT –II : (13 Hrs**)**

Lagrangian formalism : Constraints, generalized coordinates. Principle Lagrange's equations from-ApplicationsD'Alembert'sof principle, Lagrangian (plane and spherical pendulums, L-C circuit), velocity dependent potential-Lagrangian for a charged particle in electromagnetic field, Eul Hamilton's-Lagrangepicipleequation's from Hamilton's pr.

UNIT –III : (13 Hrs**)**

Hamiltonian formalism : Principle of Least Action–ApplicationsandHamilton'sof Hamiltonian equationof(motion of a particle in a central force field, projectile motion of a body). Cyclic coordinates and conservation theories, Canonical coordinates and canonical transforms, Conditions for a transformation to be canonical, generating functions, Lagrange and Poisson brackets. Hamilton equations in Poisson bracket from, Hamilton-Jacobi theory.

UNIT –IV : (13 Hrs**)**

Mechanics of continuous systems : Analysis of the free vibrations of a linear triatomic molecule, Eigen value equation- Principal axis transformation-Frequencies and normal coordinates Lagrangian formulation for continuous systems, Hamiltonian formulation.

Reference Books :

10. Classical Mechanics : By Goldstein, Poole &Safko (Pearson 2002)
11. Classical Mechanics :By JC Upadhyaya (Himalaya Publishing House)
12. Introduction to Classical Mechanics : Takwale&Puranik (TMH)
13. Classical Mechanics :Rana&Joag (TMH)
14. Classical Mechanics of Particles and Rigid Bodies :Kiran C Gupta. (New Age International Publishers)
15. Lagrangian and Hamiltonian Mechanics: Calkin (Allied Publishers 2000)
16. Lagrangian Dynamics : Dave Wells (schaum series 19)

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Semester - I Syllabus

PAE 103 TPaper –III :: Quantum Mechanics- I

UNIT –I (13 hrs) :

Basics of Quantum Mechanics : Linear Vector space, Dirac's Ket and Bra notation.Eigenvalue equation, Eigenkets and Eigenvalues – Degenerate and non-degenerate states - completeness relation, Wave functions in position and momentum space. Normalization and Orthogonality of wave functions, change of basis. Observables - Operators, Hermitian operators and their properties-Commuting and non-commuting operators, Physical significance. Matrix representations of vectors and operators – Observable and expectation value of an observable - Parity operator, Projection operator and significance. Basic commutation relations.Uncertainty principle between any two non-commuting Operators.

UNIT –II (13 hrs) :

Exactly Solvable problems : The Schrodinger, Heisenberg picture and interaction pictures.Linear harmonic oscillator-Solution to Schrodinger equation, Eigen values and Eigen functions, properties of stationary states. Linear harmonic oscillator- Solution by operators method. Raising and Lowering operators, the number operator.Hydrogen atom, solution of the radial part of the Schrodinger equations.

UNIT –III (13 hrs) :

Symmetries in Quantum Mechanics : Space and time displacements –unitary operators of space and time displacements and equations of motion.Generators of infinitesimal rotations.Space inversion and unitary inversion operator - intrinsic parity. Time reversal operator –anti-linear operator- time reversal operator for spin zero and non- zero spin particles.

UNIT –IV (13 hrs) :

Angular Momentum : Orbital Angular Momentum, Commutation Relations involving : L^2, L_x, L_y, L_z –Eigenvalues and Eigen functions of L^2 –Generalized angular momentum, J – commutation relationsbetween J^2 and components of J. J_+ and J.- Eigen values of J^2 and J_z. Matrix representation for J^2 and J_z. Spin angular momentum-Pauli spin matrices and their properties. Addition of angular momenta - Clebsch-Gordon coefficients- Recursion relations- C-G coefficients for $J_1 = ½$, $J_2 = ½$, and $J_1 = ½$, $J_2 = 1$, as examples.

Semester - I Syllabus

PAE 204 T Paper – IV : Solid State Physics

UNIT – I : (13 Hrs**)**

Crystalline State & Structural Studies : Crystal translational vectors, unit cell, Bravais lattices, Crystal system, Miller indices, Symmetry operations, Point groups, Space groups and their notation. Crystal structures of fcc, bcc, hcp, CsCl, NaCl, ZnS and Diamond. Bragg's law, Atomic structure factor, Geometrical structure factor and Debye Wallar factor, Concept of reciprocal lattice, Concept of Brillouin zones, Experimental methods of X-ray diffraction of crystals – Laue and Powder methods, Determination of unit cell parameters of a cubic crystal, Elements of neutron and electron diffraction.

UNIT – II : (13 Hrs**)**

Lattice Vibrations and Thermal Properties : Elastic waves in one dimensional array of identical atoms, Vibrational modes of a diatomic linear lattice and dispersion relations, Acoustic and Optical modes, Infrared absorption in ionic crystals, Phonons and verification of dispersion relation in crystal lattices. Lattice heat capacity- Einstein and Debye theories, Lattice thermal conductivity –Phonon mean free path, Origin of thermal expansion and Grunceisen relation.

UNIT – III : (13 Hrs**)**

Band Theory and Semiconductor Physics : Failure of Free electron theory of metals, Bloch theorem, Behavior of electron in periodic potentials, Kronig- Penny model, E vs K relation, Density of states in a band, Effective mass of electron, Negative effective mass and concept of hole. Distinction between metals, Semiconductors and Insulators, Intrinsic semiconductors, Fermi level, Expressions for electron and hole concentrations in intrinsic and extrinsic semiconductors, Hall effect in semiconductors.

UNIT – IV : (13 Hrs**)**

Crystal Growth and Imperfections : Crystal growth from solution and melt, growth from vapour phase, Experimental techniques of growth from melt. Classification of imperfections, Schottky and Frenkel defects, expression for their equilibrium concentrations in metals and ionic crystals, Colour centers and their models, Diffucion mechanisms, Fick's laws of diffucion, Kirkendal effect, Ionic conductivity, Dislocations-Edge and Screw dislocations, Dislocation multiplication, Grain boundaries.

Semester - IISyllabus

PAE 201 T Paper – I :: Electromagnetic Theory

UNIT – I : (13 Hrs)

Electro-Static Potentials and Maxwell's Field Equations : Special techniques for calculating electrostatic potential : Poisson's and Laplace's equations- Solutions of Laplace's equations for electrostatic potential in Cartesian, spherical and cylindrical coordinates-Multipole expansion of the energy of a system of charges in an electrostatic field-The scalar and vector magnetic potentials. Derivation of Maxwell's equations-General wave equation-Gauge transformations-Lorentz and Coulomb gauges-Momentum, angular momentum and free energies of electromagnetic field-Poynting Theorem (work energy theorem in electrodynamics).

UNIT – II: (13 Hrs)

Propagation of Plane Electromagnetic Waves: Electromagnetic (EM) waves in unbounded media-EM wave equation for a homogeneous isotropic dielectric medium-Propagation of plan EM waves in free space-Propagation of EM waves in homogeneous isotropic dielectric medium- Energy transmitted by a plane EM wave-Propagation of EM wave in conducing medium- Attenuation and Skin effect-Energy transmitted –Polarization of EM wave.

UNIT – III: (13 Hrs)

Interaction of Electromagnetic Waves with Matter : Propagation of EM waves in bounded media-Boundary conditions for EDB and H – Reflection and Refraction of plane EM waves at plane interface between two dielectrics- Laws of reflection and refraction-Fresnel's relations- Reflection (R) and Transmission(T) coefficients -Brewester's angle-Total internal reflection-Reflection and Refraction of plane EM waves at plane interface between non-conducing and conducting medium-Metallic reflection and its applications – Dispersion in non-conductors –Normal and anomalous dispersion.

UNIT – IV: (13 Hrs)

Electromagnetic Fields and Radiating Systems: Electromagnetic radiation: Inhomogeneous wave equation for potentials-Retarded potentials-Multi-pole expansion of EM radiation for harmonically oscillating source-Long wavelength approximation-Oscillating electric dipole radiation-Oscillating magnetic dipole radiation-Radiation from centerfed linear antenna.**Radiation from accelerated charges** : LienardWiechert potentials-Electromagnetic field of a charge in arbitrary motion.

Semester - IISyllabus

PAE 202 T Paper – II :: Statistical Mechanics

UNIT – I : (13 Hrs**)**

Relation between thermodynamics and statistical mechanics- Micro stages and macro states of a system – Phase space- Ensembles – Mean values and ensemble average – Density distribution in phase space- Liouville's theorem. Apriori probability postulate – Micro canonical, canonical and grand canonical ensembles –Quantization of phase space. Entropy and Probability –Equilibrium conditions: Thermal, mechanical and concentration equilibrium.Entropy of a perfect gas using micro canonical ensemble-Gibbs paradox-Sackur.-Tetrode equation.

UNIT – II : (13 Hrs**)**

Maxwell –Boltzmann statistics-Distribution law- Maxwell velocity distribution-Equi-partition theorem. Canonical ensemble- Partition function-Ideal gas, Grand canonical ensemble-Partition function-Ideal gas .Quantum Statistical Mechanics-Postulates-Indistinguishability-Bose-Einstein and Fermi-Dirac statistics and distribution laws.

Partition function and thermodynamic quantities-Translational, rotational and vibrational partition functions - Specific heat of diatomic molecules.

UNIT – III : (13 Hrs**)**

Ideal Bose-Einstein gas-Energy and pressure of the gas. Bose-Einstein condensation-Liquid Helium-Two Fluid model-Phonons, protons, super fluidity. Ideal Fermi-Dirac gas Energy and pressure of the gas –Electronic specific heat, thermionic emission, white dwarfs.

UNIT – IV : (13 Hrs**)**

Fluctuation-mean square deviation-Fluctuations in energy, volume and concentration Brownian motion-Classification of phase transition-Phase transitions of first and second kind: using model, Bragg-Williams approximation-One dimensional using model a application to Ferro magnetic systems-Order-Disorder transition.

Reference Books. :

2. Statistical Mechanics by SatyaPrakash and JP Agarwal (Pragati Prakahan-2002)
3. Statistical Mechanics by Gupta and Kumar (PragathiPrakahan -2002)
4. Statistical Mechanics by BK Agarwal and M Eisner (New Age Internaional)
5. Statistical Mechanics by RK Srivatava and J Ashok (Prentice Hall, India)
6. Introduction to phase transitions and critical Phenomena HE Stanley (Clrendon Press, Oxford).
7. Heat and Thermodynamics by Zemansky (TMH).

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Semester - IISyllabus

PAE 203 T Paper – III :: Quantum Mechanics – II

UNIT – I (13 hrs) :

Scattering Theory : Kinematics of Scattering Process: differential and total cross-section - Asymptotic from of scattering wave function. Scattering amplitude by Green's method. Born approximation method and screened potential and square well potential as examples - Partial wave analysis and phase shift-Optical Theorem- Relationship between phase shift and Potential. Scattering by Hard sphere.

UNIT – II (13 hrs) :

Time Independent Perturbation Theory : Approximation Methods. Non-degenerate case, First-and Second- order cases - Examples of harmonic and an-harmonic Oscillators. Degenerate case- Stark effect for H-atom for n=2 level. Variation Method - Helium atom ground state. WKB approximation method - connection formulae - application to Alpha Decay.

UNIT – III (13 hrs) :

Time Dependent Perturbation Theory : Time development of state, variation of constants (coefficients), Transition probability- Selection rules for transition. Constant perturbation. Transition probability to closely spaced leaves- Fermi's golden rule. Harmonic perturbation- Transition probability rate. Interaction of an atom with electromagnetic radiation. Electric dipole approximation. The Einstein Coefficients.

UNIT – IV (13 hrs) :

Relativistic Quantum Mechanics : Klein –Gordon Equation, Plane wave solution and Equation of continuity, Probability density- Dirac Equation, alpha, beta- matrices, Plane wave solution, significance of negative energy states. Spin of Dirac particle Relativistic particle in central potential –Total Angular Moment, Particle in a magnetic field – Spin Magnetic moment, properties of gamma matrices- Dirac's equation in covariant form.

Reference Books:

1. Quantum Mechanics by LI Schiff
2. A Text book Quantum Mechanics by PM Mathews and K Venkateshan (TMH)
3. Quantum Mechanics by Ghatak and Lokanathan (Macmillian)
4. Quantum Mechanics by E Merzbacher (John Wiley)
5. Quantum Mechanics by Aruldhas (New Age International
6. Modern Quantum Mechanics by Sakurai (Addison Wesley)

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Semester - IISyllabus

PAE 104 T **Paper – IV :: Electronics**

UNIT – I : (13 Hrs**)**

Regulated Power Supply : basic Principle of Zener regulator and its working, Transistorized Series regulator, Regulated power supplies using IC 723,78XX and Switch Mode Power Supply

Amplifiers :, Single Stage and two stage RC coupled amplifiers and their frequency response, hybrid π- model. High frequency response using hybrid π-model.

Feed back : The concept of feed back, Positive and Negative feed back. Advantages of Negative feedback in amplifiers, Emitter follower and Darlington pair.

Sinusoidal Oscillators (Using BJT's) : Barkhausen Criterion, Phase shift Oscillator, Wein Bridge Oscillator, Hartley and Collpitts Oscillators, Crystal Oscillator. **Multi-vibrators :** Collector coupled Astable, Mono-stable, Bi-stable multi-vibrators, Schmitt trigger and its applications.

UNIT – II : (13 Hrs**)**

Operational Amplifiers : Characteristics of Ideal operational Amplifier, Block diagram of an IC operational Amplifier, Emitter coupled differential amplifier and its transfer characteristics. Analysis of inverting amplifier, Non-inverting amplifier, Integrator, Differentiator, summing amplifier, Difference amplifier, Comparator, Logarithmic amplifier and exponential amplifier, Analog computation, Square wave, Rectangular wave, Triangular wave and Sine wave generators. **Timer IC 555:** Working of IC 555, Astable and Mono-stableMulti-vibrator with IC 555.

D/A Converters: R-2R ladder type, 4 bit Binary Converter, D/A Accuracy and Resolution.

A/D Converters : Counter method, Successive approximation Conversion, Dual slope A/D conversion, A/ D Accuracy and Resolution.

.UNIT – III : (13 Hrs**)**

Logic Circuits: Min terms and Max terms, Karnaugh Maps (upto 4 variables), Half adder and Full adder, Decoder/ De-multiplexer, Data selector/ Multiplexer, Encoder.

Flip –Flops: RS, D JK and M/S JK flip flops with their truth tables, timing diagrams. **Shift Registers**: Types of Registers, Serial in Serial out, Serial in Parallel out, Parallel in Serial out and Parallel in Parallel out Registers, IC 7496, Ring Counter.

Counters: Ripple (Asynchronous) Counters, Divide by N Counter, Synchronous Counters, Decade Counter using Flip-Flops and IC's 7490, 7493.

UG-2017-18

B.Sc. Semester III-Theory Syllabus

56 hrs

Subject: Physics Paper – III : Thermodynamics

(W.E.F the academic year 2017-2018)

Unit – I

1. Kinetic theory of gases: (6)

Introduction – Deduction of Maxwell"s law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases.

2. Thermodynamics: (8)

Basics of thermodynamics-Kelvin"s and Claussius statements – Thermodynamic scale of temperature – Entropy, physical significance – Change in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature- Entropy (T-S) diagram – Change of entropy of a perfect gas-change of entropy when ice changes into steam.

Unit – II

3. Thermodynamic potentials and Maxwell's equations: (7)

Thermodynamic potentials – Derivation of Maxwell"s thermodynamic relations – Clausius-Clayperon"s equation – Derivation for ratio of specific heats – Derivation for difference of two specific heats for perfect gas.Joule Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal"s gas.

4. Low temperature Physics: (7)

Joule Kelvin effect – liquefaction of gas using porous plug experiment. Joule expansion – Distinction between adiabatic and Joule Thomson expansion – Expression for Joule Thomson cooling – Liquefaction of helium, Kapitza"s method – Adiabatic demagnetization – Production of low temperatures – Principle of refrigeration, vapour compression type.

Unit – III

5. Quantum theory of radiation: (14)

Black body-Ferry"s black body – distribution of energy in the spectrum of Black body – Wein"s displacement law, Wein"s law, Rayleigh-Jean"s law – Quantum theory of radiation - Planck"s law – deduction of Wein"s distribution law, Rayleigh-Jeans law, Stefan"s law from Planck"s law.

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Measurement of radiation using pyrometers – Disappearing filament optical pyrometer – experimental determination – Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

Unit – IV

6. Statistical Mechanics: (14)

Introduction, postulates of statistical mechanics. Phase space, concept of ensembles and some known ensembles ,classical and quantum statistics and their differences, concept of probability, Maxwell-Boltzmann"s distribution law -Molecular energies in an ideal gas- Maxwell-Boltzmann"s velocity distribution law, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws, Application of B-E distribution to Photons-planks radiation formula, Application of Fermi-Dirac statistics to white dwarfs and Neutron stars.

Textbooks

1. **Fundamentals of Physics.** Halliday/Resnick/Walker.*C. Wiley India Edition 2007.*
2. **Second Year Physics** – *Telugu Academy.*
3. **Modern Physics** by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics) *S. Chand & Co.*
4. **Heat and Thermodynamics** by Mark W.Zemansky 5th edition McGraw - Hill
5. **Heat and Thermodynamics** by D.S. Mathur.

Reference Books

1. **Modern Physics** by G. Aruldhas and P. Rajagopal. *Eastern Economy Education.*
2. Berkeley Physics Course. Volume-5.**Statistical Physics** by F. Reif.*The McGraw-Hill Companies.*
3. **An Introduction to Thermal Physics** by Daniel V. Schroeder.*Pearson Education Low Price Edition.*
4. **Thermodynamics** by R.C. Srivastava, Subit K. Saha&Abhay K. *Jain Eastern Economy Edition.*
5. **Modern Engineering Physics** by A.S. Vasudeva. *S.Chand& Co. Publications.*
6. **Feyman's Lectures on Physics** Vol. 1,2,3& 4. *Narosa Publications.*
7. **Fundamentals of Optics** by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*

8 .B.B. Laud **"Introduction to statistics Mechanics"**(Macmillan 1981)
9. F.Reif: **"Statistical Physics "**(Mcgraw-Hill,1998)
10.K.Haung: **"Statistical Physics "**(Wiley Eastern 1988)

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42 hrs(3 hrs / week)

III SEMESTER Practicals Paper – III :

Thermodynamics

1. Co-efficient of thermal conductivity of a bad conductor by Lee''s method.
2. Measurement of Stefan''s constant.
3. Specific heat of a liquid by applying Newton''s law of cooling correction.
4. Heating efficiency of electrical kettle with varying voltages.
5. Determination of Thermo emf
6. Cooling Curve of a metallic body (Null method)
7. Resistance thermometer. To Determine temp coeff resistance
8. Thermal expansion of solids
9. Study of mechanical energy to heat.
10. Determine the Specific of a solid (graphite rod)
11. Thermistor Characteristics. Calculation of A and B

Note: Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week.

Text and reference books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastava

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56 hrs

B.Sc. Semester IV-Theory Syllabus

Paper – IV : Optics

(W.E.F the academic year 2017-2018)

Unit I

1 Interference: (14)

Principle of superposition – coherence – temporal coherence and spatial coherence – conditions for Interference of light

Interference by division of wave front: Fresnel"sbiprism – determination of wave length of light. Determination of thickness of a transparent material using Biprism – change of phase on reflection – Lloyd"s mirror experiment.

Interference by division of amplitude: Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) – Colours of thin films – Non reflecting films – interference by a plane parallel film illuminated by a point source – Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) – Determination of diameter of wire-Newton"s rings in reflected light with and without contact between lens and glass plate, Newton"s rings in transmitted light (Haidinger Fringes) – Determination of wave length of monochromatic light – Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light, Difference in wavelength of sodium D_1,D_2 lines and thickness of a thin transparent plate.

Unit I1:

2 Diffraction: (14)

Introduction – Distinction between Fresnel and Fraunhoffer diffraction Fraunhoffer diffraction:- Diffraction due to single slit and circular aperture – Limit of resolution – Fraunhoffer diffraction due to double slit – Fraunhoffer diffraction pattern with N slits (diffraction grating)
Resolving Power of grating – Determination of wave length of light in normal and oblique incidence methods using diffraction grating.
Fresnel diffraction-Fresnel"s half period zones – area of the half period zones –zone plate – Comparison of zone plate with convex lens – Phase reversal zone plate – diffraction at a straight edge – difference between interference and diffraction.

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Unit III:

3 Polarization (14)
Polarized light : Methods of Polarization, Polarization by reflection, refraction, Double refraction, selective absorption , scattering of light – Brewsters law – Malus law – Nicol prism polarizer and analyzer – Refraction of plane wave incident on negative and positive crystals (Huygen"s explanation) – Quarter wave plate, Half wave plate – Babinet"s compensator – Optical activity, analysis of light by Laurent"s half shade polarimeter.

Unit IV:

4 Aberrations and Fiber Optics : (14)
Introduction – Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration – the achromatic doublet – Removal of chromatic aberration of a separated doublet.
Fiber Optics : Introduction – Optical fibers – Principles of fiber communication – Step and graded index fibers – Rays and modes in an optical fiber – Fiber material – Types of optical fibers and advantages of fiber communication.

NOTE: Problems should be solved at the end of every chapter of all units.

Textbooks

1. **Optics** by AjoyGhatak. *The McGraw-Hill companies.*
2. **Optics** by Subramaniyam and Brijlal. *S. Chand & Co.*
3. **Fundamentals of Physics.** Halliday/Resnick/Walker.*C. Wiley India Edition 2007.*
4. **Optics and Spectroscopy**. R. Murugeshan and Kiruthiga Siva Prasath. *S. Chand & Co.*
5. **Second Year Physics** – *Telugu Academy.*

Reference Books

1. **Modern Engineering Physics** by A.S. Vasudeva. *S.Chand& Co. Publications.*
2. **Feyman's Lectures on Physics** Vol. 1,2,3& 4. *Narosa Publications.*
3. **Fundamentals of Optics** by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*
4. K. Ghatak, **Physical Optics'**
5. D.P. Khandelwal, Optical and Atomic Physics" (Himalaya Publishing House, Bombay,1988)
6. Jenkins and White: „Fundamental of Optics" (McGraw-Hill)
7. Smith and Thomson: „Optics" (John Wiley and sons)

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42 hrs

IV SEMESTER Practicals Paper – IV :

Optics

1. Thickness of a wire using wedge method.
2. Determination of wavelength of light using Biprism.
3. Determination of Radius of curvature of a given convex lens by forming Newton"s rings.
4. Resolving power of grating.
5. Study of optical rotation-polarimeter.
6. Dispersive power of a prism
7. Determination of wavelength of light using diffraction grating minimum deviation method.
8. Wavelength of light using diffraction grating – normal incidence method.
9. Resolving power of a telescope.
10. Refractive index of a liquid and glass (Boys Method).
11. Pulfrichrefractometer – determination of refractive index of liquid.
12. Wavelength of Laser light using diffraction grating.

Note: Minimum of eight experiments should be performed .

Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week.

Text and reference books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastava

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Department of PHYSICS

M.Sc.Physics III Semester. (CBCS) syllabus

(with effect from the academic year 2016 –2017)

P–301T

Paper – I: Core (Common for all Specializations)

MODERN OPTICS

Unit I: Principles of Lasers: Emission and absorption of Radiation –Einstein Relations, pumping Mechanisms – Optical feedback - Laser Rate equations for two, three and four level lasers, pumping threshold conditions, Laser modes of rectangular cavity –Properties of Laser beams.

Unit II: Laser Systems: Classification of laser systems –Gas, Liquid and Solid Lasers-Gas lasers and Energy level schemes: He- Ne, Argon, Co_2 Gas lasers, EXCIMER lasers-Applications. Solid State lasers: Ruby, Neodymium, YAG lasers –Dye lasers- Applications Semiconductor lasers: Ga-As lasers and applications.

Unit III: Holography: Basic Principles of Holography- Recording of amplitude and phase-The recording medium-Reconstruction of original wave front- Image formation by wave front reconstruction- Gabor Hologram- Limitations of Gabor Hologram-Off axis Hologram-Fourier transform Holograms- Volume Holograms, Applications of Holograms- Spatial frequency filtering.

Unit IV: Fourier and Non-Linear Optics: Fourier optics- Thin lens as phase transformation –Thickness function- Various types of lenses- Fourier transforming properties of lenses – Object placed in front of the lens- Object placed behind the lens.
Non-Linear Optics-Harmonic generation- Second harmonic generation- Phase matching condition- Optical mixing- Parametric generation of light –Self focusing of light.

Recommended Books:

1. Opto Electronics- An Introduction–Wilson & JFB Hawkes 2nd Edition.
2. Introduction to Fourier optics –J.W. Goodman
3. Lasers and Non-Linear optics –B.B. Laud
4. Optical Electronics –Ghatak nd Thyga Rajan.
5. Principles of Lasers –O. Svelto

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(with effect from the academic year 2016 –2017)

P – 302T

Paper –II: Core (Common for all Specializations)

ADVANCED SOLID STATE PHYSICS

Unit I: Electronic Properties: Introduction to band theory of solids. Fermi surface and Brillouin zones. Construction of Fermi surfaces. Extended, periodic and reduced zone schemes. Fermi surfaces in simple cubic, bcc and fcc lattices. Effect of electric and magnetic fields on Fermi surfaces. Anomalous and skin effects. De Hass-van Alphen effect.

Unit II: Dielectrics and Ferroelectrics: Macroscopic description of the static dielectric constant. Concept of local field. The electronic, ionic and orientational polarizabilities. Measurement of dielectric constant of a solid. Clausius-Mosotti relation. Behavior of dielectrics in an alternating field, elementary ideas on dipole relaxation. Classification of ferroelectrics- Ba TiO3 and KDP. Theory of ferroelectrics. Spontaneous polarization and ferroelectric hysteresis.

Unit III: Magnetic Properties: Diamagnetism - Langevin's theory and quantum theory. Origin of permanent magnetic moment, Theories of paramagnetism, Paramagnetic cooling. Spontaneous magnetization Weiss theory of spontaneous magnetization. Nature and origin of Weiss molecular field, Heisenberg exchange interaction. Ferromagnetic domains and hysteresis. The Bloch wall, Neel's theory of anti-ferromagnetism. Ferrimagnetism. ferrites and their applications (basic concepts only)

Unit IV: Superconductivity: Occurrence of superconductivity. Experimental observations – persistent currents, effect of magnetic field, Meissner effect, Type I and type II superconductors. Isotope effect, entropy, heat capacity and thermal conductivity. Energy gap. Microwave and infrared absorption.
Theoretical explanations:-penetrationdepthLondon`.Coherencelengthequations.Cooper pairs and elements of BCS theory. Giaver tunneling. Josephson effects (Basic ideas only). Elements of high temperature superconductors (basic concepts). Applications of superconductors.

Recommended Books:

1. Solid State Physics -- A.J.Deckker
2. Introduction to Solid State Physics -- Kittel
3. Solid State Physics -- R.L.Singhal
4. Elements of Solid State Physics -- J.P.Srivastava
5. Solid State Physics -- M.A.Wahab

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(with effect from the academic year 2016 –2017)

P 303 T/EI

Paper - III
ELECTRONIC INSTRUMENTATION

Unit I : Measurement and Error
Definitions- Accuracy and Precision –Significant figures –Types of error –Statistical analysis-Probability of errors –Limiting errors.
Performance characteristics of an instrumentation system: Zero, First and Second Order systems –Response of first and second order systems to STEP, RAMP and IMPULSE inputs-Frequency response of first and second order systems. Specification and testing of dynamic response.

Unit II : Amplifiers and Signal Conditioning
Instrumentation amplifiers- Isolation amplifiers- Chopper amplifiers- Voltage to frequency and frequency to voltage converters-Frequency multipliers - Logarithmic amplifiers,- S/H Circuits-
Attenuators. Second order active filters –Low pass , High pass, Band pass, and Band stop filters- Butterworth and Chebychev filters- Frequency transformation- All pass filters. Phase sensitive detectors (PSD) - Phase lock loop (PLL) –Lock-in-amplifier.

Unit III : Signal Generation
Frequency synthesized signal generator- Frequency divider generator- RF signal generator-Signal generator modulation- Sweep frequency generator- Function generator –Noise generator. **Signal Analysis:** Wave Analyzer- Audio frequency Wave analyzer-Heterodyne wave analyzer-Harmonic distortion analyzer- Resonant harmonic distortion analyzer-Heterodyne harmonic distortion analyzer- Fundamental suppression harmonic distortion analyzer- Spectrum analyzer-Spectra of CW, AM, FM and PM waves.

Unit IV
Electronic Measuring Instruments
Q- meter- Vector impedance meter- Digital frequency meter –Digital voltmeter –Phase meter – RF power and voltage measurement –Power factor meter –Vector volt meter.
Display and Recording: X-t, X-Y Recorders –Magnetic tape Recorders- Laser printers –Ink jet printers. - Storage oscilloscope.
Characteristics of digital displays: LED- LCD –Dot matrix and seven segment display systems.

Recommended Books

1. Modern Electronic Instrumentation and Measurement Techniques –A.O. Helfrick and W.D.Cooper, Prentice Hall India Publications.
2. Instrumentation Devices and Systems –C.S Rangan, G.R. Sharma and VSV Mani, Tata Mc Graw Hill Publications.
3. Introduction to Instrumentation and Control –A.K Ghosh –Prentice Hall IndiaPublications.
4. Electrical and Electronics Measurement and Instrumentation –A.K.Sawhney.
5. Transducers and Instrumentation- D.V.S Murty PHI Publications.

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M.Sc.Physics III Semester. (CBCS) syllabus

(with effect from the academic year 2016 –2017)

P 304A/T/EI

Paper IVA DIGITAL LOGIC CIRCUITS

Unit I : Combinational Logic Circuits
Simplifying Logic Circuits, Sum of products form - Algebraic simplification, designing combinational logic circuits, Karnaugh Map Method, looping - pairs, quads, octets, complete simplification process, Don't care condition

Digital Arithmetic Operations and Circuits Binary addition, representing signed numbers, binary subtraction, BCD addition, Hex arithmetic, ALU, parallel binary adder, design of full adder, carry propagation's, IC parallel adder, 2's compliments system, IEEE/ANSI symbols.

Unit II : Flip-Flops
NAND and NOR gate latches, clock signals and clocked flip-flops, clocked R-S, J-K, and D-FFs, D latches, Asynchronous inputs, IEEE/ANSI symbols, Timing consideration, one shot. **Counters and Registers :** Ripple counters, Counter with MOD numbers < 2. IC asynchronous counters, asynchronous down counters, propagation delay in ripple counter, Up/Down counters. Presettable counters, 74193 counter. Decoding a counter, Decoding glitches, synchronous counter design, Left & Right shift registers, shift register counters, IEEE/ANSI symbols.

Unit III : IC Logic Families
Digital IC terminology, TTL logic family, TTL series characteristics, improved TTL series, TTL loading and fan-out other TTL characteristics, connecting TTL outputs together, tristate TTL, ECL Family, MOS digital IC's and characteristics, CMOS logic and characteristics, bilateral switch, TTL driving CMOS and vice versa. Low voltage technology
MSI Logic Circuits: Decoders, BCD to 7 segment decoder/driver, liquid crystal display, Encoders, multiplexers and their applications, demultiplexers, magnitude comparators, code converters, data busing, data bus operations, IEEE./ANSI symbols,

Unit IV : Memory Devices
General Memory Operation, CPU-Memory connection, Read only memories, ROM architecture, ROM timing, and types of ROMs, Flash memory, and ROM applications. Semiconductor RAMs, RAM architectures, static RAM, Dynamic RAM (DRAM), DRAMS structure and its operation, DRAM Read/Write cycles, DRAM refreshing, Expansion of word sizes and capacity
Programmable Logic Devices and Introduction to VHDL
Basic ideas, PLD architectures (PROM), PAL, PLAS, Application of programmable logic devices - GAL 16 V, 8A, programming a PLD, Introduction to VHDL- Description Languages verses Programming Languages, HDL Format and Syntax , Intermediate signals, representing data in VHDL, Truth tables using VHDL.

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Department of PHYSICS

M.Sc.Physics IV Semester. (CBCS) syllabus

(with effect from the academic year 2016 –2017)

P 401T

Paper - I Core (Common for all Specializations)
NUCLEAR PHYSICS

Unit I:
Nuclear Force And Nuclear Models: Systematics of nuclear force-strength, range, charge independence; Deuteron problem and its contribution to the definition of the Nuclear force. Exchange force theories- Majoranna, Bartlett, Heisenberg and Yukawa.
The liquid drop model, the semi empirical mass formula and its applications. The Shell model, states based on square well potential and harmonic oscillator potential. Predictions-spins and parities of nuclear ground states, magnetic moments, electric quadrupole moments.

Unit II:
Nuclear Decay Processes: α-decay, Gamow's theory, fine structure of α-spectrum, alpha decay,systematics, neutrino of hypothesis, Fermi's theory of β-decay, Fermi-Kurie plot, angular momentum, selection rules for β-decay, -decay, Multipole radiation, selection rules.

Unit III:
Nuclear Radiation Detection: Interaction of charged particles with matter, Bohr's theory, Bethe's formula. Range-energy relation. Stopping power. Measurements of range and stopping power.Interaction of gamma rays with matter-Photoelectric effect, Compton Effect and pair production.gamma ray detection using gas, scintillation and solid state detectors.

Unit IV:
Nuclear Reactions: Classification of nuclear reactions, Kinematics and Q-value of reactions. Basic theory of direct nuclear reactions-Born approximation, stripping and pick-up reactions, characteristics, cross-sections, examples and applications. Compound nucleus formation. Theory
of Fission and fusion reactions. Nuclear structure information from nuclear reactions.
Particle Physics: Elementary Particles Classification and their Quantum Numbers (Charge,Spin,
Isospin etc). Fundamental Forces, Conservation of Parity, Strangeness and Lepton and Baryon numbers, Quark model.

Recommended Books:

1. Concepts of Nuclear Physics; B.L.Cohen (TMH)
2. Introductory Nuclear Physics: Kenneth S.Krane (Wiley)
3. Nuclear and Particle Physics:Blin-Stoyle (Chapman and Hall)
4. Nuclear Physics;I.Kaplan (Narosa 2002)
5. Introductory Nuclear Physics: W.Wong
6. Introductory Nuclear Physics: S.B.Patel
7. Nuclear Physics: Tayal

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M.Sc.Physics IV Semester. (CBCS) syllabus

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P 402T

Paper –II Core (Common for all Specializations)
SPECTROSCOPY

Unit I

Atomic Spectra: Different series in alkali spectra (main features), Ritz combination principle, Terms for equivalent & non-equivalent electron atom, Term values in alkali spectra and quantum defect, L-S and j-j coupling; Energy levels and spectra: Spectroscopic terms. Spin-Orbit interaction, doublet structure in alkali spectra, selection rules, intensity rules, alkalilike spectra, Lamb shift, many electron atoms, isotope shift; hyperfine splitting of spectral lines,selection rules. Lande interval rule.

Unit II

Molecular Spectra: Types of Molecular spectra, Regions of the Spectrums, Salient features of rotational spectra, rotational spectra of diatomic molecule as a rigid rotator, Energy levels and spectra of a non-rigid diatomic molecule, effect of isotopic substitution on rotational spectra, salient features of Vibrational-Rotational spectra, vibrating diatomic molecule as a harmonic oscillator and as anharmonic oscillator. Diatomic molecule as rigid rotator and harmonic oscillator diatomic molecule as a non-rigid rotator and anharmonic oscillator.

Unit III:

Raman and Infrared (IR) Spectra: Raman effect and its salient features, classical and quantum theory of Raman effect, normal vibrations of CO2 and H2O molecules, vibrational and
rotational Raman spectra, Infrared spectroscopy; infrared spectroscopy –basic concept of IR spectroscopy –IR spectrophotometer –Principle and Instrumentation –FTIR principle and working –interpretation of data from Raman and IR spectroscopy.

Unit IV:

Nuclear Magnetic Resonance (NMR) and Electron Spin Resonance (ESR) Spectroscopy: Nuclear spin and magnetic moment, origin of nuclear magnetic resonance (NMR) spectra, Theory of NMR spectra, relaxation process –Bloch equations –chemical shift, experimental study of NMR spectroscopy, Experimental technique, ESR spectroscopy, origin and resonance condition –quantum theory –design of ESR spectrometer –hyperfine structure of ESR absorptions, fine structure in ESR spectra, ESR instrumentation, Applications of ESR.

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M.Sc.Physics IV Semester. (CBCS) syllabus

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PEI 403 T/EI

Paper-III
INTRUMENTATION FOR MEASUREMENT AND DATA TRANSMISSION

Unit I :Transducers: Classification of transducers – Active and Passive transducers- Electrical transducers- Displacement transducers -Digital transducers -Basic requirement of a transducer .**Displacement Measurement:** Variable resistance devices– Variable inductance devices - Variable capacitance devices.
Strain Measurement: Theory of operation of strain gauge –Types of strain gauges –Strain gauge circuits _ Quarter bridge- Half bridge and Full bridge –Temperature compensation – Calibration of strains gauges –Strain gauge load cell.

Unit II :Pressure Measurement: Bourdan Tube- Bellows - Diaphrams – Transduction methods-Potentiometer device- Straingauge transducer –LVDT type transducer –Variable capacitance device –Force- balance transducer –Piezoelectric transducer- Digital Pressure Transducer-Pressure calibration.
Temperature Measurement: Classification of temperature measuring devices-Resistance type temperature sensors (platinum resistance thermometer, thermistrors) –Resistance thermometer circuts- Thermocouples –Types of thermocouples -Cold junction compensation – Solid State Sensors – Temperature measurement by radiation methods – Calibration of thermometers.
Flow Measurement : Classification of flow meters –Head type flow meters-Orifice meter- Venturi Tube- Pitot tube –Rotameter- Anemometer –Electromagnetic flow meter - Ultrasonic flow meter.

Unit III :Process Control : Open loop control –Closed loop control –Examples- Block diagram algebra -Block diagram of Closed loop system - Closed loop transfer function –DC AND AC Servomotors-Stepper motor-Temperature Control-Liquid level control.
Analog and Digital Data Acquisition Systems: Interfacing transducers to electronic control and measuring systems –Digital to analog multiplexer - Analog to Digital multiplexer - IEEE 488 Bus.

Unit IV :Data Transmission and Telemetry : Methods of data transmission–General telemetry system-Functional blocks of telemetry system –Types of telemetry systems–Land line
telemetering system-Voltage telemetering systems–Current telemetering system-Position telemetering system– Land line telemetry feedback system-Radio frequency telemetry - PAM. PCM Telemetering–Multiplexing in telemetering system- Transmission channels- Digital data transmission.

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M.Sc.Physics IV Semester. (CBCS) syllabus

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PEI 404A/T/EI

Paper –IVA
EMBEDDED SYSTEMS AND ITS APPLICATIONS

Unit I : The 8051 Microcontroller

Introduction to Microcontrollers : History of Microcontrollers and Microprocessors, Embedded Versus External Memory Devices, CISC and RISC Processors, Harvard and Von Neumann Architectures, Block diagram of the 8051; **Inside the 8051,** Assembling and Running an 8051 Program, The Program Counter and ROM space, Date Types and Directives, Flag Bits and PSW Register, Register Banks and Stack;**Pin Description,** I/O Programming, Bit Manipulation,**Addressing Modes-** Immediate and Register Addressing Modes, Accessing Memory using Various Addressing Modes

Unit II: Programming the 8051
Instruction Set- Arithmetic instruction Programs- Add, Subtract, Multiplication and Division of Signed and Unsigned and Unsigned Numbers; **Logical** Instruction and Programs- Logic, Compare, Rotate, Swap, BCD and ASCII Application Programs; **Single Bit** Instructions and Programming –Single Bit Instructions with CY; **Jump, Loop** and call Instructions. Time Delay Generation and Calculation; Timer/Counter Programming, Serial Communication an interrupts Programming.

Unit III : PIC Microcontrollers
Overview and Features, **PIC 16C6X/7X** Architecture (PIC 16C61/C71), Registers, Pin diagram, Reset action Memory Organization, **Instructions**, Addressing Modes, I/O Ports, Interrupts, Timers, Analog-to- Digital Converter (ADC).
Pin Diagram of PIC **16F8XX Flash Microcontrollers**, Registers, Memory organization, Interrupts, I/O Ports and Timers.

Unit –IV : Industrial Applications of Microcontrollers
Connecting of - Light Emitting Diodes (LEDs), Push Buttons, Relays and Latches.
Interfacing of - Keyboard, 7-Segment Displays, LCD Interfacing, ADC and DAC with 89C51 Microcontrollers.
Measurement Applications of – Robot Arm, LVDT, RPM Meter, Digital Thermo Meter and Strain Gauges.
Automation and Control Applications of –PID Controllers, D C Motors and Stepper Motors.

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2018-19

B.Sc. (Physics) Semester I-Theory Syllabus 56 hrs
Subject: Physics
Paper – I: Mechanics

Unit – I

1. Vector Analysis (14)

Scalar and vector fields, gradient of a scalar field and its physical significance.Divergence and curl of a vector field and related problems.Vector integration- line, surface and volume integrals. Stokes, Gauss and Greens theorems- simple applications in physics

Unit – II

2. Mechanics of Particles (07)

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions,collisions in CM and lab frames, concept of impact parameter, scattering cross-section and Rutherford Scattering.

3. Mechanics of rigid bodies (07)

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Euler's equation, precession of a top, Gyroscope, Precession of Equinoxes and its consequences.

Unit – III

4. Central forces (14)

Central forces – definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions. Effects of Coriolis force.

Unit – IV

5. Special theory of relativity (14)

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, Twin Paradox, length contraction, addition of velocities, mass-energy relation. Concept of four vector formalism, Principle of Equivalence and Applications of relativity in daily life.

NOTE: Problems should be solved at the end of every chapter of all units.

B.Sc. Semester II-Theory Syllabus 56 hrs
Subject: Physics
Paper – II: Waves and Oscillations

Unit – I

1. Fundamentals of vibrations (14)

Simple harmonic oscillator, and solution of the differential equation– Physical characteristics of SHM, torsion pendulum, - measurements of rigidity modulus, compound pendulum, measurement of g, combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures-uses of Lissajous Figures, Comparison of parallel and perpendicular super positions.

Unit – II

2. Damped and forced oscillations (14)

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance, Resonance in electrical circuits (LCR series circuit),Coupled Oscillators and An harmonic Oscillators.

Unit – III

3. Vibrating Strings (14)

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones, energy transport, transverse impedance, waves in two and three dimensions.

Unit – IV

4. Vibrations of bars (14)

Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the midpoint iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Comparison of longitudinal and transverse waves, Tuning fork.

NOTE: Problems should be solved at the end of every chapter of all units.

B.Sc. Semester III-Theory Syllabus 56 hrs
Subject: Physics
Paper – III: Thermodynamics

Unit – I

1.Kinetic theory of gases: (6)
Introduction – Deduction of Maxwell"s law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases.

2.Thermodynamics: (8)
Basics of thermodynamics-Kelvin"s and Claussius statements – Thermodynamic scale of temperature – Entropy, physical significance – Change in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature-Entropy (T-S) diagram – Change of entropy of a perfect gas-change of entropy when ice changes into steam.

Unit – II

3.Thermodynamic potentials and Maxwell's equations: (7)
Thermodynamic potentials – Derivation of Maxwell"s thermodynamic relations – Clausius-Clayperon"s equation – Derivation for ratio of specific heats – Derivation for difference of two specific heats for perfect gas.Joule Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal"s gas.

4.Low temperature Physics: (7)
Joule Kelvin effect – liquefaction of gas using porous plug experiment. Joule expansion – Distinction between adiabatic and Joule Thomson expansion – Expression for Joule Thomson cooling – Liquefaction of helium, Kapitza"s method – Adiabatic demagnetization – Production of low temperatures – Principle of refrigeration, vapour compression type.

Unit – III

5.Quantum theory of radiation: (14)
Black body-Ferry"s black body – distribution of energy in the spectrum of Black body – Wein"s displacement law, Wein"s law, Rayleigh-Jean"s law – Quantum theory of radiation - Planck"s law – deduction of Wein"s distribution law, Rayleigh-Jeans law, Stefan"s law from Planck"s law.
Measurement of radiation using pyrometers – Disappearing filament optical pyrometer – experimental determination – Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

Unit – IV

6.Statistical Mechanics: (14)

Introduction, postulates of statistical mechanics. Phase space, concept of ensembles and some known ensembles ,classical and quantum statistics and their differences, concept of probability, Maxwell-Boltzmann"s distribution law -Molecular energies in an ideal gas-Maxwell-Boltzmann"s velocity distribution law, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws, Application of B-E distribution to Photons-planks radiation formula, properties of B-E gas, Application of Fermi-Dirac statistics to white dwarfs and Neutron stars, properties of F-D gas.

Textbooks

1. **Fundamentals of Physics**. Halliday/Resnick/Walker.*C. Wiley India Edition 2007.*
2. **Second Year Physics** – *Telugu Academy.*
3. **Modern Physics** by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics) *S. Chand & Co.*
4. **Heat and Thermodynamics** by Mark W.Zemansky 5th edition Mc Graw - Hill
5. **Heat and Thermodynamics** by D.S. Mathur.

Reference Books

1. **Modern Physics** by G. Aruldhas and P. Rajagopal, *Eastern Economy Education.*
2. Berkeley Physics Course. Volume-5. **Statistical Physics** by F. Reif. *The McGraw-Hill Companies.*
3. **An Introduction to Thermal Physics** by Daniel V. Schroeder.*Pearson Education Low Price Edition.*
4. **Thermodynamics** by R.C. Srivastava, Subit K. Saha&Abhay K. *Jain Eastern Economy Edition.*
5. **Modern Engineering Physics** by A.S. Vasudeva. *S.Chand& Co. Publications.*
6. **Feyman's Hrs on Physics** Vol. 1,2,3& 4. *Narosa Publications.*
7. **Fundamentals of Optics** by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*
8. B.B. Laud **"Introduction to statistics Mechanics"**(Macmillan 1981)
9. F.Reif: **"Statistical Physics "**(Mcgraw-Hill,1998) 10 .K.Haung: **"Statistical Physics "**(Wile Eastern 1988)

B.Sc. Semester V-Theory Syllabus 42 hrs
Subject: (Physics)
Paper – V: Electromagnetism

Unit I:

1. Electrostatics (11)

Electric Field:- Concept of electric field lines and electric flux, Gauss"s law (Integral and differential forms), application to linear, plane and spherical charge distributions. Conservative nature of electric field E, irrotational field. Electric Potential:- Concept of electric potential, relation between electric potential and electric field, potential energy of a system of charges. Energy density in an electric field. Calculation of potential from electric field for a spherical charge distribution. Calculation of electric field and electric potential due to electric dipole.

Unit II:

2. Magnetostatics (12)

Concept of magnetic field B and magnetic flux, Biot-Savart's law, B due to a straight current carrying conductor. Force on a point charge in a magnetic field. Properties of B, curl and divergence of B, solenoidal field. Integral form of Ampere"s law, applications of Ampere"s law: field due to straight, circular and solenoidal currents. Energy stored in magnetic field. Magnetic energy in terms of current and inductance. Magnetic force between two current carrying conductors. Magnetic field intensity. Ballistic Galvanometer:- Torque on a current loop in a uniform magnetic field, working principle of B.G., current and charge sensitivity, electromagnetic damping, critical damping resistance.

Unit III:

3. Electromagnetic Induction (9)

Faraday"s laws of induction (differential and integral form), Lenz"s law, self and mutual Induction. Self-Inductance of a long solenoid. Energy density in a magnetic shell. Mutual Inductance of two given coils. Continuity equation, modification of Ampere's law, displacement current, Maxwell equations

Unit IV:

4. Electromagnetic waves (10)

Maxwell's equations in vacuum and dielectric medium, boundary conditions, plane wave equation: transverse nature of EM waves, velocity of light in vacuum and in medium, Poyting theorem, Production and detection of electromagnetic waves (Hertz Experiment). Polarization, reflection and transmission. Polarization of EM waves, Brewster's angle, description of linear, circular and elliptical polarization.

B.Sc. Semester V-Theory Syllabus

Subject: Physics

Paper-VI-A – Solid State Physics **42 hrs**

(DSC- Elective-I)

Unit-I (11)

1. Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Bravias Lattices and Basis. Unit Cell. Miller Indices. Types of Lattices. Crystal Structures of FCC, BCC and HCP. CsCl, NaCl, ZnS and Diamond Structures. Reciprocal Lattice. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Laue and Powder methods. Atomic and Geometrical Factor.

2. Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit"s Law, Einstein and Debye theories of specific heat of solids. T3 law

Unit-II (11)

3. Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia–and Paramagnetic Domains. Curie"s law, Weiss"s Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

4. Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability.

Unit-III (10)

5. Free electron theory of metals. Behaviour of electron in periodic potentials. Bloch theorem. Elementary band theory: Kronig Penny model. Band Gap. Brillouin zones, effective mass of electron. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect, Electric Conductivity by four probe method & Hall coefficient.

UNIT IV (10)

6. Optical properties of Solids. Classical Model- Drude model. Ionic Conduction. Maser and Laser. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Types of Lasers. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. Applications of Lasers Einstein"s A and B coefficients..

7.Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London"s Equation and Penetration Depth. Isotope effect. Idea of BCS theory. D.C and A.C Josepson effects. Recent applications of superconductivity.

B.Sc. Semester VI-Theory Syllabus

Subject: (Physics)

Paper-VII – MODERN PHYSICS **42 hrs**

(DSC- Compulsory)

UNIT-I (11hrs)

Atomic Spectra and Models Inadequacy of classical physics:

Brief Review of Black body Radiation, Photoelectric effect, Compton Effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohr's model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Somerfield's Modification of Bohr's Theory.

UNIT-II (11hrs)

Wave Particle Duality de Broglie hypothesis, Experimental confirmation of matter wave, Davisson Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity, wave packets, Gaussian Wave Packet, spatial distribution of wave packet, Localization of wave packet in time. Time development of a wave Packet; Wave Particle Duality, Complementarity. Heisenberg Uncertainty Principle, Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Time independent and time dependent Schrodinger wave equation. Estimation of ground state energy of harmonic oscillator and hydrogen atom, non-existence of electron in the nucleus. Uncertainty and Complementarities.

UNIT-III (9 hrs.)

Nuclear Physics Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

Unit IV (11 hrs.)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions), Classification of Elementary Particles, Applications of Radioactivity (Radiometric Dating, Medical Applications, Industrial Applications)

B.Sc. Semester VI-Theory Syllabus
Subject: Physics
Paper-VIII-A: Basic Electronics 42 hrs
(DSE- Elective-II)

Unit-I: (10 hrs)

1. Network Elements and Network Theorems

Passive elements, Power sources, Active Elements, Network Models: T and π Transformations, Super position theorem, Thevenin"s Theorem, Norton"s theorem. Reciprocity Theorem and Maximum power transfer theorem (Simple problems). Two-port Networks – Introduction- Z-parameters, Y-parameters, h-parameters and ABCD-parameters (Simple problems).

Unit – II: (10 hrs)

2. Band theory of P-N junction

Energy band in solids (band theory), valence band, conduction band and forbidden energy gap solids, Insulators, semi conductors and, pure or intrinsic semiconductors and impurity or extrinsic semi-conductors. N-type extrinsic semi-conductors, P-type extrinsic semi-conductors, Fermi level, continuity equation.

3. Diodes: P-N junction diode, Bridge rectifier. Half wave rectifier and Full wave rectifier. Zener diode & its Characteristics. Zener diode as voltage regulator.

Unit-III: (11hrs)

4. Bipolar Junction Transistor (BJT) – p-n-p and n-p-n transistors, current components in transistors, CB, CE and CC configurations – transistor as an amplifier -RC coupled amplifier. (Qualitative analysis)

5. Feedback Concept & Oscillators: Feedback, General theory of feedback–Concepts of a Oscillators, Barkhausen"s criteria, Phase shift Oscillator. Wein Bridge Oscillator.

Unit-IV: (11 hrs)

6. Digital Electronics

Binary number system, converting Binary to Decimal and vice versa. Binary addition and subtraction (1"s and 2"s complement methods). Hexadecimal number system. Conversion from Binary to Hexadecimal – vice versa and Decimal to Hexadecimal vice versa.

7. Logic gates:

OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive – OR gate (EX-OR). De Morgan"s Laws – Statement and proof. Half Adder and Full Adder.

NOTE: Problems should be solved from every chapter of all units.

UG - 2019 - 20.

B.Sc. Semester V-Theory Syllabus
Subject: (Physics)
Paper – V: Electromagnetism

42 hrs

Unit I:

1. Electrostatics (11)

Electric Field:- Concept of electric field lines and electric flux, Gauss"s law (Integral and differential forms), application to linear, plane and spherical charge distributions. Conservative nature of electric field E, irrotational field. Electric Potential:- Concept of electric potential, relation between electric potential and electric field, potential energy of a system of charges. Energy density in an electric field. Calculation of potential from electric field for a spherical charge distribution. Calculation of electric field and electric potential due to electric dipole.

Unit II:

2. Magnetostatics (12)

Concept of magnetic field B and magnetic flux, Biot-Savart's law, B due to a straight current carrying conductor. Force on a point charge in a magnetic field. Properties of B, curl and divergence of B, solenoidal field. Integral form of Ampere"s law, applications of Ampere"s law: field due to straight, circular and solenoidal currents. Energy stored in magnetic field. Magnetic energy in terms of current and inductance. Magnetic force between two current carrying conductors. Magnetic field intensity. Ballistic Galvanometer:- Torque on a current loop in a uniform magnetic field, working principle of B.G., current and charge sensitivity, electromagnetic damping, critical damping resistance.

Unit III:

3. Electromagnetic Induction (9)

Faraday"s laws of induction (differential and integral form), Lenz"s law, self and mutual Induction. Self-Inductance of a long solenoid. Energy density in a magnetic shell. Mutual Inductance of two given coils. Continuity equation, modification of Ampere's law, displacement current, Maxwell equations

Unit IV:

4. Electromagnetic waves (10)

Maxwell's equations in vacuum and dielectric medium, boundary conditions, plane wave equation: transverse nature of EM waves, velocity of light in vacuum and in medium, Poyting theorem, Production and detection of electromagnetic waves (Hertz Experiment). Polarization, reflection and transmission. Polarization of EM waves, Brewster's angle, description of linear, circular and elliptical polarization.

V Semester Practicals
Paper – V: Electromagnetism

36 hrs

Marks: 50

1. To verify the Thevenin Theorem
2. To verify Norton Theorem
3. To verify Superposition Theorem
4. To verify maximum power transfer theorem.
5. To determine a small resistance by Carey Foster"s bridge.
6. To determine the (a) current sensitivity, (b) charge sensitivity, and (c) CDR of a B.G.
7. To determine high resistance by leakage method.
8. To determine the ratio of two capacitances by De Sauty"s bridge.
9. To determine self-inductance of a coil by Anderson"s bridge using AC.
10. To determine self-inductance of a coil by Rayleigh"s method.
11. To determine coefficient of Mutual inductance by absolute method.

Note: Minimum of eight experiments should be performed.
Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week.

Reference Books

1. B. L. Worsnop and H. T. Flint, **Advanced Practical Physics**, Asia Publishing House, New Delhi.
2. Indu Prakash and Ramakrishna, **A Text Book of Practical Physics**, Kitab Mahal

B.Sc. Semester V-Theory Syllabus

Subject: Physics

Paper-VI-A – Solid State Physics **42 hrs**

(DSC- Elective-I)

Unit-I (11)

1. Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Bravias Lattices and Basis. Unit Cell. Miller Indices. Types of Lattices. Crystal Structures of FCC, BCC and HCP. CsCl, NaCl, ZnS and Diamond Structures. Reciprocal Lattice. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Laue and Powder methods. Atomic and Geometrical Factor.

2. Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit"s Law, Einstein and Debye theories of specific heat of solids. T3 law

Unit-II (11)

3. Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia–and Paramagnetic Domains. Curie"s law, Weiss"s Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

4. Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability.

Unit-III (10)

5. Free electron theory of metals. Behaviour of electron in periodic potentials. Bloch theorem. Elementary band theory: Kronig Penny model. Band Gap. Brillouin zones, effective mass of electron. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect, Electric Conductivity by four probe method & Hall coefficient.

UNIT IV (10)

6. Optical properties of Solids. Classical Model- Drude model. Ionic Conduction. Maser and Laser. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Types of Lasers. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. Applications of Lasers Einstein"s A and B coefficients..

7.Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London"s Equation and Penetration Depth. Isotope effect. Idea of BCS theory. D.C and A.C Josepson effects. Recent applications of superconductivity.

V Semester Practicals 36 hrs
Paper – VI A: Solid State Physics

1. Measurement of susceptibility of paramagnetic solution (Quinck`s Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To study the PE Hysteresis loop of a Ferroelectric Crystal.
6. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
7. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150^{o} C) and to determine its band gap.
8. To determine the Hall coefficient of a semiconductor sample.
9. Calculation of d-values of a given Laue"s pattern.
10. Calculation of d-values of powder diffraction method.
12. To study the spectral characteristics of a Photo- Voltaic cell.
13. Verification of Bragg"s equation.

Reference Books

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

B.Sc. Semester V-Theory Syllabus 42 hrs

Subject: (Physics)

Paper-VI B – QUANTUM MECHANICS AND APPLICATIONS

(DSE- Elective-II)

Unit-I (11 hrs)

Schrodinger equation & the operators: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Hermitian operator, Eigen values and Eigen functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle.

Unit II (11 hrs)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigen values; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle.

Unit-III (10 hrs)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions ground state, zero point energy & uncertainty principle. One dimensional infinitely rigid box- energy eigen values and eigen functions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimensionacross a step potential & rectangular potential barrier.

Unit-IV (10 hrs)

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor"s Theorem. Spin Magnetic Moment. SternGerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (12 Hrs)

V – Semester Practicals 36 hrs

Paper – VI C: Quantum Mechanics and Applications

Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom: Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is ≈ -13.6 eV. Take e = 3.795 (eVÅ)1/2, ħc = 1973 (eVÅ) and m = 0.511x106 eV/c2.

2. Solve the s-wave radial Schrodinger equation for an atom: where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take e = 3.795 (eVÅ)1/2, m = 0.511x106 eV/c2, and a = 3 Å, 5 Å, 7 Å. In these units ħc = 1973 (eVÅ). The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m: For the anharmonic oscillator potential for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose m = 940 MeV/c2, k = 100 MeV fm-2, b = 0, 10, 30 MeV fm-3In these units, ch = 197.3 MeV fm. The ground state energy I expected to lie between 90 and 110 MeV for all three cases.

4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule: Where μ is the reduced mass of the two-atom system for the Morse potential Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function. Take: m = 940x106eV/C2, D = 0.755501 eV, α = 1.44, ro = 0.131349 Å

Laboratory based experiments:

5. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency
6. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
7. To show the tunneling effect in tunnel diode using I-V characteristics.
8. Quantum efficiency of CCDs

Reference Books:

1. Numerical Recipes in C: The Art of Scientific Computing, W.H. Pressetal., 3rd Edn., 2007, Cambridge University Press.
2. An introduction to computational Physics, T.Pang, 2nd Edn.,2006, Cambridge Univ. Press • Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández.2014 Springer.
3. Scilab (A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011 S. Chand & Co.

B.Sc. Semester VI-Theory Syllabus

Subject: (Physics)

Paper-VII – MODERN PHYSICS **42 hrs**

(DSC- Compulsory)

UNIT-I (11hrs)

Atomic Spectra and Models Inadequacy of classical physics:

Brief Review of Black body Radiation, Photoelectric effect, Compton Effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohr's model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Somerfield's Modification of Bohr's Theory.

UNIT-II (11hrs)

Wave Particle Duality de Broglie hypothesis, Experimental confirmation of matter wave, Davisson Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity, wave packets, Gaussian Wave Packet, spatial distribution of wave packet, Localization of wave packet in time. Time development of a wave Packet; Wave Particle Duality, Complementarity. Heisenberg Uncertainty Principle, Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Time independent and time dependent Schrodinger wave equation. Estimation of ground state energy of harmonic oscillator and hydrogen atom, non-existence of electron in the nucleus. Uncertainty and Complementarities.

UNIT-III (9 hrs.)

Nuclear Physics Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

Unit IV (11 hrs.)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions), Classification of Elementary Particles, Applications of Radioactivity (Radiometric Dating, Medical Applications, Industrial Applications)

VI Semester Practicals
Paper VII: Modern Physics 36 hrs

1. Measurement of Planck"s constant using black body radiation and photo-detector
2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine the Planck"s constant using LEDs of at least 4 different colors.
4. To determine the ionization potential of mercury.
5. To determine the absorption lines in the rotational spectrum of Iodine vapour.
6. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
7. To setup the Millikan oil drop apparatus and determine the charge of an electron.
8. To show the tunneling effect in tunnel diode using I-V characteristics.
9. To determine the wavelength of laser source using diffraction of single slit.
10. To determine the wavelength of laser source using diffraction of double slits.
11. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction rating
12. To determine the value of e/m for electron by long solenoid method.
13. Photo Cell – Determination of Planck"s constant.
14. To verify the inverse square law of radiation using a photo-electric cell.
15. To find the value of photo electric work function of a material of the cathode using a photo-electric cell.
16. Measurement of magnetic field – Hall probe method.
17. To determine the dead time of a given G.M. tube using double source.
18. Hydrogen spectrum – Determination of Ridge berg"s constant
19. Energy gap of intrinsic semi-conductor
20. G. M. Counter – Absorption coefficients of a material.
21. To draw the plateau curve for a Geiger Muller counter.
22. To find the half-life period of a given radioactive substance using a G.M. Counter.

Reference Books

1. **Advanced Practical Physics for students**, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House

2. **Advanced level Physics Practicals,** Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers

B.Sc. Semester VI-Theory Syllabus
Subject: Physics
Paper-VIII-A: Basic Electronics — 42 hrs
(DSE- Elective-II)

Unit-I: (10 hrs)

1. Network Elements and Network Theorems

Passive elements, Power sources, Active Elements, Network Models: T and π Transformations, Super position theorem, Thevenin"s Theorem, Norton"s theorem. Reciprocity Theorem and Maximum power transfer theorem (Simple problems). Two-port Networks – Introduction- Z-parameters, Y-parameters, h-parameters and ABCD-parameters (Simple problems).

Unit – II: (10 hrs)

2. Band theory of P-N junction

Energy band in solids (band theory), valence band, conduction band and forbidden energy gap solids, Insulators, semi conductors and, pure or intrinsic semiconductors and impurity or extrinsic semi-conductors. N-type extrinsic semi-conductors, P-type extrinsic semi-conductors, Fermi level, continuity equation.

3. Diodes: P-N junction diode, Bridge rectifier. Half wave rectifier and Full wave rectifier. Zener diode & its Characteristics. Zener diode as voltage regulator.

Unit-III: (11hrs)

4. Bipolar Junction Transistor (BJT) – p-n-p and n-p-n transistors, current components in transistors, CB, CE and CC configurations – transistor as an amplifier -RC coupled amplifier. (Qualitative analysis)

5. Feedback Concept & Oscillators: Feedback, General theory of feedback–Concepts of a Oscillators, Barkhausen"s criteria, Phase shift Oscillator. Wein Bridge Oscillator.

Unit-IV: (11 hrs)

6. Digital Electronics

Binary number system, converting Binary to Decimal and vice versa. Binary addition and subtraction (1"s and 2"s complement methods). Hexadecimal number system. Conversion from Binary to Hexadecimal – vice versa and Decimal to Hexadecimal vice versa.

7. Logic gates:

OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive – OR gate (EX-OR). De Morgan"s Laws – Statement and proof. Half Adder and Full Adder.

NOTE: Problems should be solved from every chapter of all units.

VI Semester Practicals

36 hrs

Paper – VIII A: Basic Electronics

1. AND, OR, NOT, gates – Truth table Verification
2. AND, OR, NOT – gates constructions using universal gates – Verification of truth tables.
3. NAND and NOR gates truth table verification
4. Characteristics of a Transistor in CE configuration
5. R.C. coupled amplifier – frequency response.
6. Verification of De Morgan"s Theorem.
7. Zener diode V-I characteristics.
8. Verification Thevenin"s theorem.
9. Maximum Power Transfer theorem
10. P-n junction diode V- I characteristics.
11. Zener diode as a voltage regulator
12. Construction of a model D.C. power supply
13. R C phase shift Oscillator –determination of output frequency

Every student should complete minimum 06 experiments.

Text Books

1. **B.Sc. Practical Physics** – C. L. Arora – S. Chand & Co.
2. **Viva-voce in Physics** – R.C. Gupta, Pragathi Prakashan, Meerut.
3. **Laboratory manual for Physics Course** by B.P. Khandelwal.
4. **Practical Physics** by M. Arul Thakpathi by Comptex Publishers.
5. **B.Sc. practical physics** – Subbi Reddy.

B.Sc. Semester VI-Theory Syllabus 42 hrs

(DSE- Elective-II)

Subject: Physics

Paper-VIII-B: Physics of Semiconductor Devices

Unit-I: (11 hrs)

Semiconductor Physics: Conductors, Semiconductors, forbidden orbits, energy levels, crystals and covalent bonds, free electrons and holes, recombination and life-time, energy bands. Intrinsic Semiconductor- intrinsic carrier concentration, density of electrons in conduction band, fermi-level, mass action law. Carrier transport phenomena- mobility, resistivity, diffusivity, Einstein"s relation, current density equation. Extrinsic semiconductor-n-type semiconductor, p-type semiconductor, energy band diagram of extrinsic semiconductor. Hall effect- mobility and Hall angle, experiment arrangement for the study of Hall effect, significance of Hall effect.

Unit – II: (11 hrs)

P-N junction-Depletion layer, Energy level diagram of p-n junction, Band structure of an open circuited p-n junction, Biasing of p-n junction, effect of barrier potential on forward bias, reverse leakage current, reverse breakdown, P-n junction under various conditions-thermal equilibrium, forward and reverse bias, current-voltage characteristics. Derivation of ideal diode equation of p-n junction, diode model and its approximations. Forward and reverse resistance of diode. Dynamic characteristic of diode.

Unit-III: (10 hrs)

Special diodes-Zener diode, Light –emitting diode (LED), Photo-diode, Schottky diode, Backward diodes and Tunnel diode.
Transistors- Bipolar junction transistor (BJT), transistor characteristics, transistor equation in active region, field effect transistor (FET), Phototransistor and MOSFETTs.

Unit-IV: (10 hrs)

Control devices- Shockley Diode, Silicon Controlled Rectifier (SCR), Silicon Controlled Switch (SCS), Unijunction transistor (UJT), Solar Cells, Opto-couplers.

Text books

1. A First Course in Electronics- Anwar A. Khan& Kanchan K. Dey, PHI
2. Physics of Semiconductor Devices- S. M. Sze
3. Physics of Semiconductors- Streetman

VI Semester Practicals
Paper – VIII-B
Physics of Semiconductor Devices

36 hrs

1. Characteristics of a Transistor in CE configuration
2. Zener diode V-I characteristics.
3. P-n junction diode V- I characteristics.
4. Zener diode as a voltage regulator
5. Determination of carrier concentration using Hall effect
6. Thermistor characteristics
7. Efficiency of a LED
8. Solar cell: fill factor and efficiency
9. FET characteristics
10. SCR characteristics
11. UJT characteristics

Every student should complete minimum 06 experiments.

Text Books

1. Basic electronics, Grob
2. Practical Electronics, Zbar

TARA GOVERNMENT COLLEGE (A), SANGAREDDY

DEPARTMENT OF ELECTRONICS

2017-18

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc (MPE)	I	I	NIL	NIL
2	B.Sc (MPE)	I	II	NIL	NIL
3	B.Sc (MPE)	II	III	2	Introduced CBCS
4	B.Sc (MPE)	II	IV	2	Introduced CBCS
5	B.Sc (MPE)	III	YWS	NIL	NIL
TOTAL				04	

Total No. of Courses: 09

Total No. of Courses having changes: 04

Percentage of revision: 44%

2018-19

S.No	Programme	Year	Semester	Number of courses changed	Remarks
1	B.Sc (MPE)	I	I	NIL	NIL
2	B.Sc (MPE)	I	II	NIL	NIL
3	B.Sc (MPE)	II	III	NIL	NIL
4	B.Sc (MPE)	II	IV	NIL	NIL
5	B.Sc (MPE)	III	V	4	Introduced CBCS
6	B.Sc (MPE)	III	VI	4	Introduced CBCS
TOTAL				8	

Total No. of Courses: 16

Total No. of Courses having changes: 08

Percentage of revision: 50%

Chairman,
Board of Studies
Department of Electronics
Tara Govt College, Sangareddy-502 001

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ELECTRONICS SYLLUBUS

B.Sc.II YEAR

Semester-III

DSC –Paper –III : Analog Circuits

Total number of hours :60

No of hours per week :4

Credits:4

UNIT-I

Rectifiers and filters: Rectifiers– half wave, full wave and bridge rectifiers, Efficiency, Ripple factor, regulation, harmonic components in rectified output, **Filters** – choke input (inductor) filter, Shunt capacitor filter, L section and π section filters.

UNIT – II

Regulated Power Supplies: Block diagram of regulated power supply, Series and shunt transistor regulated power supplies, three terminal IC regulators (78XX and 79XX), Principle and working of switch mode power supply (SMPS). UPS –Principle and working.

UNIT – III

Transistor amplifier: Classification of amplifiers, Hybrid π model of a transistor, RC coupled amplifier – frequency response and analysis.

Feedback in amplifiers: Positive and negative feedback, Effect of negative feedback on gain, bandwidth, noise, input and output impedances. Emitter follower, Darlington pair and itsadvantages

UNIT – IV

Oscillators: Barkhausen criterion for sustained oscillations, RC oscillators- RC phase shift and Wien's bridge oscillators, LC oscillators- Hartley and Colpitt.

Multi-vibrators: Astable, Mono stable and Bi-stable multi-vibrators (Qualitative treatment using BJT's only)

Recommended Books:

1. Electronic Devices and Circuits-Millman and Halkias(TMH)
2. Basic Electronics and linear circuits - Bhargava, Kulshreshta& GuptaTMH
3. A first course in Electronics-AA Khan and KK Dey-PHI
4. Electronic Devices and Circuit Theory-Robert L Boylestad& LouisNashelsky
5. Pulse, Digital and Switching circuits by Milliman andTaub

B.Sc. II YEAR, Semester – III : Electronics Practical

Paper - III: Analog Circuits Lab

No. of hours per week : 3

1. Study of HWR, FWR and bridge rectifier, determination of ripplefactor.
2. Series inductor, shunt capacitor, L-section and π-section filters; determination of ripple factor using Full waveRectifier.
3. Study of voltage regulator using IC's - 78XX &79XX.
4. Colpitt oscillator – determination offrequency.
5. RC Phase shift oscillator- determination offrequency
6. Astable multi-vibrator – determination of time period and dutycycle.

7. **Simulation experiments :**

   i) Rectifiers

   ii) RC coupledamplifier

   iii) Wein bridgeoscillator

   iv) Colpitt oscillator

   v) RC phase shiftoscillator

   vi) Astablemulti-vibrator

Note: Student has to perform minimum of <u>Six</u> experiments

1) Lab manual for Electronic Devices and Circuits –4th Edition. By David A Bell –PHI
2) Basic Electronics – A Text Lab Manual –Zbar, Malvino,Miller.

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B.Sc. ELECTRONICS SYLLABUS

B.Sc. II YEAR, Semester – IV

DSC- Paper - IV: Linear Integrated Circuits and Basics of Communication

Total number of hours : 60

No of hours per week:4

Credits:4

UNIT:1

Operational Amplifiers: Emitter Coupled Differential amplifier, Block diagram of Opamp. Character of Opamp, Opamp parameters-Input resistance, Output resistance, Common mode rejection ratio (CMI Slew rate, offset voltages, Input bias current, Basic Op-Amp circuits-Inverting Op-Amp, Virtual gro Non-inverting Op-Amp, Frequency response of Op-Amp. Op Amp as: Summing amplifier, subtra Comparator, Voltage follower, Integrator, and Differentiator.

UNIT- II

Applications of Op-Amps: Logarithmic amplifier, Sine wave [Wien Bridge] generator and square [Astable] generator, Triangular wave generator, Mono stable multi-vibrator, Solving of simple se order differential equations. Basic Op-Amp series regulator and shunt regulator, IC 555 Timer [B diagram and its working], IC 555 as mono stable and astable multi-vibrators.

UNIT – III

Modulation: Need for modulation-Types of modulation- Amplitude, Frequency and Phase modulatio **Amplitude modulation**: Analysis of Amplitude modulation, side bands, modulation index, AM modulator, Balanced modulator, Demodulation – diodedetector.

UNIT – IV

Frequency modulation: Analysis of FM, Working of simple frequency modulator, - detection o waves – FM Discriminator. Advantages of frequency modulation.AM and FM Transmitters and receivers [block diagram approach]. Introduction to PAM, PPM, PWM, and PCM, Delta modulation

Reference Books:

1. Op amps and linear Integrated Circuits – RamakantGayakwad,PHI
2. Linear Integrated Circuits- D Roy Choudhury and Shail BJain
3. Electronic Communication Systems-George Kennedy & BernardDavis
4. Principles of Electronic Communication Systems-Louis E Frezne, TMH

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B.Sc. II YEAR , Semester – IV: Electronics Practical

Paper - IV: Linear Integrated Circuits and Basics of Communication Lab

Total number of hours per week: 3

Practical :Using IC 741OpAmp and IC 555 Timer :

1. Op amp as inverting Amplifier- determination of gain (with AC and DC).
2. Op amp as non- inverting Amplifier- determination of gain(with AC and DC).
3. OP Amp as Summing amplifier and comparator(Zero crossingdetector)
4. Astable multi-vibrator – determination of time period and dutycycle.
5. Mono stable multi-vibrator- determination of gatewidth.
6. Integrator/ Differentiator – study of waveforms.
7. Astable multi-vibrator using IC 555
8. Mono stable multi-vibrator using IC 555.
9. AM modulator anddetector
10. FM modulator anddetector

Simulation of all the above experiments:

1. Inverting and Non-inverting amplifiers andcomparator
2. Integrator/ Differentiator using op amp
3. Wein bridgeoscillator
4. Astable multi-vibrator using OpAmp
5. Astable multi-vibrator using IC 555

Note: Student has to perform minimum of Sixexperiments

1) Lab manual for Electronic Devices and Circuits –4th Edition. By David A Bell –PHI
2) Basic Electronics – A Text Lab Manual –Zbar, Malvino,Miller.

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B.Sc. ELECTRONICS SYLLABUS

B.Sc. III YEAR, Semester - V

DSC- Paper - V: Digital Electronics

Total number of hours : 45

No of hours per week:3

Credits; 4

UNIT-I

Number system and Logic gates: Conversions of Binary, octal, Decimal & hexadecimal numb systems, Binary addition and subtraction (1's and 2's complement methods).

Logic gates- OR, AND, NOT, XOR, NAND, NOR gates and their Truth tables – Design of basic gat using the Universal gates- NAND and NOR gates, Half adder, Full adder and parallel adder logic circui Logic families and their characteristics – TTL, CMOS and ECL logic circuits.

UNIT-II

Boolean algebra and Combinational logic circuits: Boolean algebra- Laws and identities, DeMorgan' Theorems. Simplification of Boolean expressions using Boolean identities- Reduction of Boolean expressions using Karnaugh Maps - Sum of Products (SOP) representation (up to four variables). Multiplexer, De-Multiplexer, Decoder (3 to 8) and Encoder(8 to 3).

UNIT-III

Sequential logic circuits: Flip-flops - SR, D, JK, T and Master-Slave JK ;**Registers** - Shift Registers- SISO,SIPO, PISO and PIPO Registers, Universal shift register(IC 7496), **Shift register counters-** Ring counter , Johnson Counter.

UNIT-IV

Counters and Semiconductor memories:

4-bit Asynchronous (Ripple) counter, Modulo-N counter, synchronous counter. Up/down counters – ripple counter IC7493 - Decade counter IC7490 – working, truth tables and timing diagrams.

Semiconductor memories :: Organization and working of ROM, types of ROM's - PROM, EPROM, EEPROM, FLASH, RAM- static and dynamic.

Books Recommended:

1. Digital Principles and Applications – Malvino& Leach - TMH.
2. Digital Principles and Applications-Ronald J.Tocci-– PearsonEducation.
3. Text book of Electronics Bsc III year (vol.III)-TeluguAkademi
4. Digital Fundamentals – F.Loyd& Jain – Pearson Education.
5. Fundamentals of Digital Circuits – Anand Kumar – PHI
4. Digital Electronics Principles and Integrated circuits – Maini – Wiley India.
5. Digital Electronics -Gothman

B.Sc. ELECTRONICS SYLLABUS

B.Sc. III YEAR , Semester – V Practical

Paper V : Digital Electronics Lab

No. of hour per week :3

1. Verification of truth tables of AND, OR, NOT, NAND, NOR, EXOR Gates using IC 74XX series.
2. Construction of basic gates using NAND and NORgates.
3. Construction of Half Adder using gates. Verification of truthtable.
4. Construction of Full Adder using gates and verification of truthtable.
5. Verification of truth tables of flip flops: RS, D, and JK usingIC's.
6. Construction of binary counters7493

Simulation experiments:

1. 4bit parallel adder using Full adders.
2. Decade counter using JK flipflops.
3. Up/Down counters using JK flipflops.
4. Up/down counter using74193
5. Multiplexer/De-Multiplexer.
6. Encoder.

Note: Student has to perform minimum of Sixexperiments

1. Lab manual for Electronic Devices and Circuits –4th Edition. By David A Bell –PHI
2. Basic Electronics – A Text Lab Manual –Zbar, Malvino,Miller.

B.Sc. ELECTRONICS SYLLABUS
B.Sc. III YEAR, Semester – V
Paper – VI A (Elective)
DSE- 01 :8085 Microprocessor and Applications

Total number of hours : 45
No of hours per week:3

Credits:4

UNIT-I

Introduction to 8085 Microprocessor & its architecture:: Introduction to Microcomputer, Intel 8085 Microprocessor – Architecture of 8085 microprocessor – CPU – Timing & Control Unit – Instruction cycle, Fetch Cycle , Execute cycle (Timing diagram), Machine cycle and clock states. Interrupts – Hardware and Software, Address space partitioning – Memory mapped I/O & I/O mapped I/O .

UNIT-II

Instruction set of 8085 microprocessor: Classification - Data transfer operations, Arithmetic operations, logical operations, Branch control operations and stack, I/O and Machine control operations. Stack and Subroutines, Addressing modes

UNIT-III

Programming of 8085 microprocessor: Assembly language programming, addition(8 and 16 bit), 8 bit - subtraction, multiplication and division. Finding the largest and smallest number in data array Program to arrange the given numbers in ascending and descending order. Counters and Time delays

UNIT-IV

Interfacing of peripherals: Types of programmable and non programmable interfacing peripherals- 8212(I/O port)– programmable peripheral interface 8255.
D/A Converters(binary weighted, R-2R ladder network), A/D Converters(Dual slope , Successive approximation), Closed loop and open loop process control systems(concept only), Stepper motor control.

Books Recommended:

1) Microprocessor Architecture and Programming – Ramesh S.Goanker –Penram.
2) Fundamentals of Microprocessors and Micro controllers – B.Ram, - Dhanpat rai&sons.
3) Text book of Electronics B.SC III year (Vol.III)-TeluguAcademy.
4) Introduction to Microprocessor – AdityaP.Mathur –TMH.
5) Microprocessor Lab Premier – K.A.Krishnamurthy.

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B.Sc. ELECTRONICS SYLLABUS
B.Sc. III YEAR , Semester – VI Practical

Paper – VII : 8085 Microprocessor Lab

No. of hours per we

I. 8085 – Software Experiments:

1. Binary addition (8 bit and 16 bit)and subtraction (8 bit).
2. Decimal Addition (DAA).
3. Multiplication and Division (8 bit).
4. Picking of largest/Smallest number from the given data.
5. Arranging the given data in ascending/descendingorder.
6. Time Delaygeneration.

II. 8085 - HardwareExperiments:

1. R – 2R ladder network (DAC) (4 bits).
2. Interfacing a Stepper motor and rotating it clockwise/anticlockwise direction through a known angle.
3. Interfacing a seven segmentdisplay.
4. Interfacing ADC for temperaturemeasurement.

Note: Student has to perform minimum of Sixexperiments

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B.Sc. ELECTRONICS SYLLABUS
B.Sc. III YEAR , Semester – VI
Paper - VII
DSE :DIGITAL COMMUNICATION

Total number of hours : 45
No of hours per week:3

Credits; 4

UNIT-1

Signals Analysis : Complex Fourier spectrum, Fourier transform, Properties of F.T, sampling theoren random signals and noise, correlation and power spectrum.

Unit- II: Digital Communication Systems: A/D and D/A converter, Coded communication, AM, PWM PPM, PCM, delta modulation, adaptive delta modulation, quantizationand noise consideration. Digital Transmission and Reception: Timing, base band systems, ASK, FSK, PSK, QAM.

Unit - III: Error detection and coding: Parity check, CRC, Hamming distance, Hamming codes, Cyclic codes, line synchronization codes, Manchester code, NRZ coding,Walsh codes.

Unit -IV:Case studies: Paging system, cellular telephone, global positioning satellite, Facsimile, Videotext.

Reference Books:

1. Analog and Digital Communication systems- M.S. Roden, 3rd Edition, Prentice Hall ofIndia.
2. Modern Digital and Analog Communication Systems-B.P. Lathi.
3. Communication Techniques for digital and Analog signals – M. Kanefsky, John Wiley andSon.
4. Telecommunication – T.H. Brewster, McGrawHill.
5. Principles of Digital communication, Das, Chatterjee and Mallick, Wiley EasternLtd.

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B.Sc. ELECTRONICS SYLLABUS
B.Sc. III YEAR , Semester – VI Practical
Paper – VII :DIGITAL COMMUNICATIONLab

No. of hours per week

I.Experiments inInternetworking:

1) Testing of RJ-45 Cable (Straight/Cross)
2) Introduction to LAN cable and Hub.
3) Verifying physical and logicaladdress.
4) Sending data/ Data transfer from system tosystem.
5) Concept ofHTTP.
6) File transferFTP.
7) Introduction to server and client.
8) Introduction to network IPaddress.
9) Identification of NET ID usingmasks.
10) Mail transfer usingSMTP.
11) Encryption (plain text toHypertext).
12) Study of Routerconfiguration.
13) Study of two networks between LAN and LAN/ MAN and MAN/ WAN andWAN.
14) Introduction to networkdevices.
15) Static Routing.
16) Basic RIP (observe RIP routers and understand thecommands)
17) RIPV2.
18) OSPF (Open Shortest PathFirst)

II Experiments in DataCommunication.

1) Study of serialcommunication.
2) Study of protocol incommunications.
3) Study of Fiber opticcommunications.
4) Study of wirelesscommunications.
5) Study of parallelcommunication.

Note : Minimum 10 experiments to be studied

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B.Sc. ELECTRONICS SYLLABUS
B.Sc. III YEAR , Semester – VI
Paper VIII – A (Elective)

DSE ; 8051 Microcontroller and Applications

Total number of hours:45

No of hours per week:3

Credits;4

UNIT-I

The Microcontroller 8051: Overview and block diagram of 8051. Architecture and pin diagram 8051. Data types and directives, Memory Organisation, register banks and Stack Pointer. PSW Regis other special function registers, I/O port organization.Interrupts and Timer/Countermodules.

UNIT-II

Instruction set of 8051 microcontroller : Classification- Data transfer, Arithmetic, logical, Single Bit, Jump, Loop and CALL instructions and their usage. Addressing modes - Immediate, Register, Direct, Indirect, Absolute addressing, Relative addressing, Indexed Addressing and accessing memory using various addressing modes.

UNIT-III

Programming examples of microcontroller 8051:

Addition, Subtraction, division, picking the smallest/largest number among a given set of numb arranging a given a set of numbers in ascending/descending order, Subroutines, I/O Programming, manipulation. Accessing a specified port terminal and generating wave forms.

Timer/Counter Programming in 8051: Programming 8051 timers- basic registers of timers- Timer0, Timer1 registers. TMOD register, TCON register. Timer modes - Mode1, Mode2 programming. Coun mode programming. Program to generate time delay.

Unit – IV

Serial communications: Serial communication, Types, modes and protocols, Data transfer rates, seria communication program- SBUF and SCON registers, RS232 standards,Programming timer Interrupts,

Applications of Micro controller: Displaying information on a LCD, Interfacing a keyboard, Interfacing a temperature sensor,Interfacing of DAC 0808 to microcontroller, Interfacing of ADC 080 microcontroller,Seven segmentLED.

Books Recommended:

1) The 8051 Microcontrollers and Embedded Systems – Muhammad AliMazidi and Janice GillipsieMazidi – Pearson Education Asia, 4th Reprint,2002.
2) Text book of ElectonicsBsc III year (vol.III)-TeluguAkademi.
3) Fundamentals of Microprocessors and Microcontrollers –B.Ram.
4) The 8051 Microcontroller – architecture, programming and applications KennthJ. Ayala-Penram International Publishing,1995.
5) Micro controllers-Theory and Applications-AjayV.Deshmukh.

B.Sc. ELECTRONICS SYLLABUS
B.Sc. III YEAR, Semester VI

Paper - VIII Practical (Elective) 8051
Microcontroller and applications Lab

No. of hours per wee

Experiments using 8051 microcontroller:

1. Multiplication of two numbers using MUL command (later using counter method for repeated addition).
2. Division of two numbers using DIV command (later using counter method forrepeated subtraction).
3. Pick out the largest/smallest number among a given set ofnumbers.
4. Arrange the given numbers in ascending/descendingorder.
5. Generate a specific time delay usingtimer/counter.
6. Interface ADC and a temperature sensor to measuretemperature.
7. Interface DAC and generate a staircase wave form with a step duration and number of steps as variables.
8. Flash a LED connected at a specified out portterminal.
9. Interface stepper motor to rotate clock wise / anti clock wise through a given anglesteps.

Experiments with Keil Software:

1. Write a program to pick out largest/smallest number among a given set ofnumber.
2. Write a program to arrange a given set of numbers in ascending/descendingorder.
3. Write a program to generate a rectangular/square wave form at specifiedport.
4. Write a program to generate a time delay using timerregisters.

Note: Student has to perform minimum of Six Experiments

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DEPARTMENT OF COMPUTER SCIENCE & APPLICATION

Tara Govt. College, Sangareddy (A)

Syllabus Revision Details

2016-17 to 2020-21

S.No.	Academic Year	Total Number of Programes Offered	Programes with Syllabus Change	% of Syllabus change
1	2016-17	28	14	50
2	2017-18	38	12	31.6
3	2018-19	43	19	44.2
4	2019-20	57	13	22.8
5	2020-21	81	34	42
		247	92	37.4

BLCS
BCCA

20/01/22

DEPARTMENT OF COMPUTERS
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Syllabus Revision Details for the Academic Year 2017-18

Dept. of Computer Science and Computer Applications						
Syllabus revision details for the academic year 2017-18						
S.NO	PROGRAMME NAME	YEAR	SEMESTER	No. of COURSES	No. of COURSES CHANGED	JUSTIFICATION
1	BSC COMP.SCI	I	I	3	NIL	
2	BSC CA	I	I	1	NIL	
3	B.A.C.A.	I	I	1	NIL	
4	BCOM	I	I	3	NIL	
5	BSC COMP.SCI	I	II	3	NIL	
6	BSC CA	I	II	1	NIL	
7	B.A.C.A.	I	II	1	NIL	
8	BCOM	I	II	1	NIL	
9	BSC COMP.SCI	II	III	3	3	**CBCS SYSTEM WAS INTRODUCED HENCE SYLLBUS CHANGED**
10	BSC CA	II	III	1	1	
11	B.A.C.A.	II	III	1	1	
12	BCOM	II	III	1	1	
13	BSC COMP.SCI	II	IV	3	3	**CBCS SYSTEM WAS INTRODUCED HENCE SYLLBUS CHANGED**
14	BSC CA	II	IV	1	1	
15	B.A.C.A.	II	IV	1	1	
16	BCOM	II	IV	1	1	
17	BSC COMP.SCI	III	Not Applicable	6	NIL	
18	BSC CA	III	Not Applicable	2	NIL	
19	B.A.C.A.	III	Not Applicable	2	NIL	
20	BCOM	III	Not Applicable	2	NIL	
				38	12	
TOTAL NUMBER OF COURES = 38						
NUMBER OF COURSES WITH SYLLABUS CHANGE = 12						
PERCENTAGE OF COURSES WITH SYLLABUS CHANGE= 31.6%						

Faculty

12/38

Incharge

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With Effect from the Academic Year 2016-2017

Syllabus for Computer Science

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+2P=6	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+2P=6	4 + 1 =5
	SEMESTER – III			
BS301	A: SciLab – 1 B: Boolean Algebra	SEC–1	2T	2
BS306	Data Structures	DSC–3C	4T+2P=6	4 + 1 =5
	SEMESTER – IV			
BS401	C: SciLab – 2 D: Digital Logic	SEC–2	2T	2
BS406	Database Management Systems	DSC–3D	4T+2P=6	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE–1	2	2
BS502	E: Python – 1 F: Computer Organization	SEC–3	2	2
BS505	Programming in Java	DSC–3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Operating Systems Elective–B: Software Engineering	DSE–1E DSE–2E	3T+2P=5	3 + 1 =4
	SEMESTER – VI			
BS601	Information Technologies –2	GE–2	2T	2
BS602	G: Python – 2 H: Information Security	SEC–4	2T	2
BS605	Computer Networks	DSC–3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP with MySQL Elective–B: Web Technologies	DSE–1F DSE–2F	3T+2P=5	3 + 1 =4
		Total Number of Credits		**48**

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DSC-3C Data Structures BS306

Theory	4 Hours/Week	4 credits
Practical	2 Hours/Week	1 credit

Unit - I

Fundamental Concepts: Introduction to Data Structures, Types of Data Structures, Introduction to Algorithm, Pseudo-code, Flow Chart, Analysis of Algorithms.

Linear Data Structure Using Arrays: 1-D Arrays, 2-D Arrays, N-D Arrays, Memory Representation and Address Calculation of 1-D, 2-D, N-D Arrays, Concept of Ordered List, String Manipulation, Pros and Cons of Arrays.

Stacks: Concept, Primitive Operations, Abstract Data Type, Representation Stacks Using Arrays, Prefix, Infix, Postfix Notations for Arithmetic Expression, Applications of Stacks- Converting Infix Expression to Postfix Expression, Evaluating the Postfix Expression, Checking Well-formed (Nested) Parenthesis, Processing of Function Calls, Reversing a String.

Unit - II

Recursion: Introduction, Recurrence, Use of Stack in Recursion, Variants of Recursion, Execution of Recursive Calls, Recursive Functions, Iteration versus Recursion.

Queues: Concept, Primitive Operations, Abstract Data Type, Representation Queues Using Arrays, Circular Queue, Double-Ended Queue, Applications of Queues.

Linked Lists: Introduction, Concept, Terminology, Primitive Operations-creating, inserting, deleting, traversing, Representation of Linked Lists, Linked List Abstract Data Type, Linked List Variants - Singly Linked List, Doubly Linked List, Linear and Circular Linked List, Representation Stacks and Queues Using Linked Singly Lists, Application of Linked List-Garbage Collection.

Unit - III

Trees: Introduction, Representation of a General Tree, Binary Tree Introduction, Binary Tree Abstract Data Type, Implementation of Binary Trees, Binary Tree Traversals - Preorder, Inorder, Postorder Traversals, Applications of Binary Trees Briefly.

Graphs: Introduction, Graph Abstract Data Type, Representation of Graphs, Graph Traversal - Depth-First Search, Breadth-First Search, Spanning Tree - Prim's Algorithm, Kruskal's Algorithm.

Hashing: Introduction, Hash Functions, Collision Resolution Strategies.

Unit - IV

Searching and Sorting: Sequential (Linear) Search, Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, and Comparison of Sorting Techniques.

Heaps: Concept, Implementation, Abstract Data Type, Heap Sort.

Text Varsha H. Patil, *Data Structures Using C++*

References

Nell Dale, *C++ Plus Data Structures*
Seymor Lipschutz, *Data Structures (Revised 1e)*
Adam Drozdek, *Data Structures and Algorithms in C++*
Mark Allen Weiss, *Data structures and Algorithm Analysis in C++ (4e)*
D.S. Malik, *C++ Programming: Program Design Including Data Structures (6e)*
Michael Main, Walter Savitch, *Data Structures and Other Objects Using C++ (4e)*
Michael T. Goodrich, R. Tamassia, David M. Mount, *Data Structures and Algorithms in C++*
Yonghui Wu, Jiande Wang, *Data Structure Practice for Collegiate Programming Contests and Education*

DSC-3D Database Management Systems BS406

Theory	4 Hours/Week	4 credits
Practical	2 Hours/Week	1 credit

Unit - I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

Relational Model: Introduction, Terminology, Integrity Constraints, Views.

The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation, Aggregation and Grouping Operations.

Unit - II

SQL: Introduction, Data Manipulation-Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXISTS and NOT EXIST, Combining Result Tables, Database Updates.

SQL: The ISO SQL Data Types, Integrity Enhancement Feature-Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition-Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index, Views-Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, View Materialization, Transactions, Discretionary Access Control-Granting Privileges to Other Users, Revoking Privileges from Users.

Advanced SQL: The SQL Programming Language-Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

Unit - III

Entity-Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models-Fan Traps, Chasm Traps.

Enhanced Entity-Relationship Modeling: Specialization/Generalization, Aggregation, Composition.

Functional-Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional Dependency, Multi Valued Dependency, Join Dependency.

Normalization: The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization,1NF, 2NF, 3NF, BCNF. The Database Design Methodology for Relational Databases (Appendix-D).

Unit - IV

Transaction Management: Transaction Support-Properties of Transactions, Database Architecture, Concurrency Control-The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery-The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques, Nested Transaction Model.

Security: Database Security-Threats, Computer-Based Controls-Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

Text

Thomas M. Connolly, Carolyn E. Begg, *Database Systems-A Practical Approach to Design, Implementation, and Management (6e)*

References

Sharon Allen, Evan Terry, *Beginning Relational Data Modeling*

Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, *Modern Database Management*

Raghu Ramakrishnan, Johannes Gehrke, *Database Management Systems*

Ramez Elmasri, Shamkant B. Navathe, *Fundamentals of Database Systems*

Abraham Silberschatz, Henry F. Korth, S. Sudarshan, *Database System Concepts*

C Coronel, S Morris, Peter Rob, *Database Systems: Design, Implementation, and Management*

With Effect from the Academic Year 2016-2017

Syllabus for Computer Applications

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+2P=6	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+2P=6	4 + 1 =5
	SEMESTER – III			
BS301	A: SciLab – 1 B: Python – 1	SEC–1	2T	2
BS306	Relational Database Management Systems	DSC–3C	4T+2P=6	4 + 1 =5
	SEMESTER – IV			
BS401	C: SciLab – 2 D: Python – 2	SEC–2	2T	2
BS406	Computer Networks	DSC–3D	4T+2P=6	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE–1	2	2
BS502	E: R Basics – 1 F: Ruby	SEC–3	2	2
BS505	Multimedia Systems	DSC–3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Web Technologies Elective–B: Visual Programming	DSE–1E DSE–2E	3T+2P=5	3 + 1 =4
	SEMESTER – VI			
BS601	Information Technologies –2	GE–2	2T	2
BS602	G: R Basics – 2 H: Ruby on Rails	SEC–4	2T	2
BS605	Mobile Applications	DSC–3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP Programming Elective–B: Information Security and Cyber Laws	DSE–1F DSE–2F	3T+2P=5	3 + 1 =4
		Total Number of Credits		**48**

DSC-3C Relational Database Management Systems BS306

Theory	4 Hours/Week	4 credits
Practical	2 Hours/Week	1 credit

Unit - I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.
Relational Model: Introduction, Terminology, Integrity Constraints, Views.

Unit - II

SQL: Introduction, Data Manipulation-Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXISTS and NOT EXIST, Combining Result Tables, Database Updates.
SQL: The ISO SQL Data Types, Integrity Enhancement Feature-Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition-Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index, Views-Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, View Materialization, Transactions.

Unit - III

Advanced SQL: The SQL Programming Language-Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.
Entity-Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models-Fan Traps, Chasm Traps.
Enhanced Entity-Relationship Modeling: Specialization/Generalization, Aggregation, Composition.

Unit - IV

Functional-Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional Dependency.
Normalization: The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization,1NF, 2NF, 3NF, BCNF. The Database Design Methodology for Relational Databases (Appendix-D).
Transaction Management: Transaction Support-Properties of Transactions, Database Architecture, Concurrency Control-The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods.

Text

Thomas M. Connolly, Carolyn E. Begg, *Database Systems-A Practical Approach to Design, Implementation, and Management (6e)*

References

Sharon Allen, Evan Terry, *Beginning Relational Data Modeling*
Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, *Modern Database Management*
Raghu Ramakrishnan, Johannes Gehrke, *Database Management Systems*
Ramez Elmasri, Shamkant B. Navathe, *Fundamentals of Database Systems*
Abraham Silberschatz, Henry F. Korth, S. Sudarshan, *Database System Concepts*
Carlos Coronel, Steven Morris, Peter Rob, *Database Systems: Design, Implementation, and Management*

DSC-3D Computer Networks BS406

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit - I

Introduction: Computer-System Architecture, Computing Environments.
Operating-System Structures: Operating-System Services, User Interface for Operating-System, System Calls, Types of System Calls, Operating System Structure.
Process Concept, CPU Scheduling Concepts, Scheduling Criteria, Overview of Main Memory, Virtual Memory, Mass-Storage Structure, File Systems and File System Implementation.

Unit - II

Introduction: Data Communication Components, Line Configuration, Topologies, Transmission Mode, Categories of Networks, ISO Reference Model-Layered Architecture, TCP/IP Reference Model.
Transmission Media: Guided Media-Twisted Pair Cable, Coaxial Cable, Optical Fiber, Unguided Media-Satellite Communication, and Cellular Telephony.

Unit - III

Data Link Layer: Error Detection-VRC, LRC, CRC, Checksum, Error Correction-Hamming Code, Burst Error Correction, Line Discipline-ENQ/ACK, Poll/Select, Flow Control-Stop-and-Wait, Sliding Window, Error Control-Stop-and-Wait ARQ, Sliding Window ARQ Go-Back-n ARQ, Selective-Reject ARQ.
Local Area Networks: Introduction to IEEE 802, Ethernet-CSMA/CD, Implementation, Token Ring,-Token Passing, Implementation. Overview of Multiplexing and Switching.

Unit - IV

Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Brouters, Switches, Distance Vector Routing Algorithm. Transport Layer: Duties of Transport Layer, Connection.
Upper OSI Layers; Session Layer, Presentation Layer, Application Layer.

Text

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Concepts (9e)*
Behrouz A. Forouzan, *Data Communication and Networking (2e Update)*

References

Andrew S. Tanenbaum, *Modern Operating Systems*
Dhananjay M. Dhandhere, *Operating Systems - A Concept Based Approach*
S.S. Shinde, *Computer Networks*
William Stallings, *Data and Computer Communications*
Andrew S. Tanenbaum, David J Wetherall, *Computer Networks*
Behrouz A Forouzan, Firouz Mosharraf, *Computer Networks A Top-Down Approach*
James F. Kurose, Keith W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*

With Effect from the Academic Year 2016-2017

Syllabus for Computer Applications

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+2P=6	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+2P=6	4 + 1 =5
	SEMESTER – III			
BS301	A: SciLab – 1 B: Python – 1	SEC–1	2T	2
BS306	Relational Database Management Systems	DSC–3C	4T+2P=6	4 + 1 =5
	SEMESTER – IV			
BS401	C: SciLab – 2 D: Python – 2	SEC–2	2T	2
BS406	Computer Networks	DSC–3D	4T+2P=6	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE–1	2	2
BS502	E: R Basics – 1 F: Ruby	SEC–3	2	2
BS505	Multimedia Systems	DSC–3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Web Technologies Elective–B: Visual Programming	DSE–1E DSE–2E	3T+2P=5	3 + 1 =4
	SEMESTER – VI			
BS601	Information Technologies –2	GE–2	2T	2
BS602	G: R Basics – 2 H: Ruby on Rails	SEC–4	2T	2
BS605	Mobile Applications	DSC–3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP Programming Elective–B: Information Security and Cyber Laws	DSE–1F DSE–2F	3T+2P=5	3 + 1 =4
		Total Number of Credits		**48**

DSC-3C Relational Database Management Systems BS306

Theory	4 Hours/Week	4 credits
Practical	2 Hours/Week	1 credit

Unit - I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

Relational Model: Introduction, Terminology, Integrity Constraints, Views.

Unit - II

SQL: Introduction, Data Manipulation–Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXISTS and NOT EXIST, Combining Result Tables, Database Updates.

SQL: The ISO SQL Data Types, Integrity Enhancement Feature–Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition–Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index, Views–Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, View Materialization, Transactions.

Unit - III

Advanced SQL: The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

Entity–Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models–Fan Traps, Chasm Traps.

Enhanced Entity–Relationship Modeling: Specialization/Generalization, Aggregation, Composition.

Unit - IV

Functional–Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional Dependency.

Normalization: The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization,1NF, 2NF, 3NF, BCNF. The Database Design Methodology for Relational Databases (Appendix–D).

Transaction Management: Transaction Support–Properties of Transactions, Database Architecture, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods.

Text

Thomas M. Connolly, Carolyn E. Begg, *Database Systems–A Practical Approach to Design, Implementation, and Management (6e)*

References

Sharon Allen, Evan Terry, *Beginning Relational Data Modeling*

Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, *Modern Database Management*

Raghu Ramakrishnan, Johannes Gehrke, *Database Management Systems*

Ramez Elmasri, Shamkant B. Navathe, *Fundamentals of Database Systems*

Abraham Silberschatz, Henry F. Korth, S. Sudarshan, *Database System Concepts*

Carlos Coronel, Steven Morris, Peter Rob, *Database Systems: Design, Implementation, and Management*

DSC-3D Computer Networks BS406

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit - I

Introduction: Computer-System Architecture, Computing Environments.
Operating-System Structures: Operating-System Services, User Interface for Operating-System, System Calls, Types of System Calls, Operating System Structure.
Process Concept, CPU Scheduling Concepts, Scheduling Criteria, Overview of Main Memory, Virtual Memory, Mass-Storage Structure, File Systems and File System Implementation.

Unit - II

Introduction: Data Communication Components, Line Configuration, Topologies, Transmission Mode, Categories of Networks, ISO Reference Model-Layered Architecture, TCP/IP Reference Model.
Transmission Media: Guided Media-Twisted Pair Cable, Coaxial Cable, Optical Fiber, Unguided Media-Satellite Communication, and Cellular Telephony.

Unit - III

Data Link Layer: Error Detection-VRC, LRC, CRC, Checksum, Error Correction-Hamming Code, Burst Error Correction, Line Discipline-ENQ/ACK, Poll/Select, Flow Control-Stop-and-Wait, Sliding Window, Error Control-Stop-and-Wait ARQ, Sliding Window ARQ Go-Back-n ARQ, Selective-Reject ARQ.
Local Area Networks: Introduction to IEEE 802, Ethernet-CSMA/CD, Implementation, Token Ring,-Token Passing, Implementation. Overview of Multiplexing and Switching.

Unit - IV

Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Brouters, Switches, Distance Vector Routing Algorithm. Transport Layer: Duties of Transport Layer, Connection.
Upper OSI Layers; Session Layer, Presentation Layer, Application Layer.

Text

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Concepts (9e)*
Behrouz A. Forouzan, *Data Communication and Networking (2e Update)*

References

Andrew S. Tanenbaum, *Modern Operating Systems*
Dhananjay M. Dhandhere, *Operating Systems - A Concept Based Approach*
S.S. Shinde, *Computer Networks*
William Stallings, *Data and Computer Communications*
Andrew S. Tanenbaum, David J Wetherall, *Computer Networks*
Behrouz A Forouzan, Firouz Mosharraf, *Computer Networks A Top-Down Approach*
James F. Kurose, Keith W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*

DEPARTMENT OF COMMERCE, O.U.

Structure of B.Com (Computer Application) (CBCS) for Osmania University, Hyderabad.
(w.e.f. Academic Year 2016-17)

B.COM (Computer Applications) PROGRAMME

FIRST YEAR: ***SEMESTER-I***					
Sl.No.	***Code***	***Course Title***	***Course Type***	***HPW***	***Credits***
(1)	(2)	(3)	(4)	(5)	(6)
1.	BC101	A/B/C/D	AECC-1	2	2
2.	BC102	English	CC-1A	5	5
3.	BC103	Second Language	CC-2A	5	5
4.	BC104	Financial Accounting - I	DSC-1A	5	5
5.	BC105	Business Economics	DSC-2A	5	5
6.	BC106	Business Organization	DSC-3A	4	4
7.	BC107	Information Technology	DSC-4A	3T+2P	4
		Total		**31**	**30**
SEMESTER-II					
8.	BC201	A/B/C/D	AECC-2	2	2
9.	BC202	English	CC-1B	5	5
10.	BC203	Second Language	CC-2B	5	5
11.	BC204	Financial Accounting - II	DSC-1B	5	5
12.	BC205	Managerial Economics	DSC-2B	5	5
13.	BC206	Principles of Management	DSC-3B	4	4
14.	BC207	Relational Database Management Systems	**DSE-2B**	**5**	**5**
		Total		**30**	**30**
SECOND YEAR: ***SEMESTER-III***					
15.	BC301	Principles of Insurance Business	SEC-1	2	2
16.	BC302	English	CC-1C	5	5
17.	BC303	Second Language	CC-2C	5	5
18.	BC304	Advanced Accounting	DSC-1C	5	5
19.	BC305	Income Tax-I	DSC-2C	5	5
20.	BC306	Business Statistics-I	DSC-3C	4	4
21.	BC307	Programming with C	**DSE-2A**	**5**	**5**
		Total		**31**	**30**
SEMESTER-IV					
22.	BC401	Practice of Life Insurance	SEC-2	2	2
23.	BC402	English	CC -1D	5	5
24.	BC403	Second Language	CC-2D	5	5
25.	BC404	Corporate Accounting	DSC-1D	5	5
26.	BC405	Income Tax-II	DSC-2D	5	5
27.	BC406	Business Statistics-II	DSC-3D	4	4
28.	BC407	Objective Oriented Programming with C++	**DSE-2A**	**4T+2P**	**5**
		Total		**30**	**30**

Paper: (BC 307): PROGRAMMING WITH C

Paper: BC 307
PPW: 4 (3T+2P)
Credits : 4

Max. Marks: 70T + 30P
Exam Duration: 3 Hrs.

Objective s: *To gain the skills of Structured (Procedural/Functional) Programming using C Language.*

UNIT-I: INTRODUCTION TO C LANGUAGE, DATA TYPES AND I/O OPERATIONS:
Introduction: Types of Languages – History of C language – Basic Structure – Creating – Compiling - Linking and Executing the C Program - Pre-processors in "C".
Types and I/O operations: Keywords & Identifiers – Constants – Variables - Scope and Life of a Variable - Data types - Storage classes - Reading a character or values - Writing a character or value - Formatted Input and Output operations.

UNIT-II: OPERATORS, EXPRESSIONS AND DECISION MAKING:
Operators: Introduction – Arithmetic – Relational – Logical – Assignment - Conditional - Special operators – Expressions: Arithmetic – Evaluation - Type conversions.
Decision Making & Looping: Introduction - If statements - If-else statements - Switch statements - Conditional statements - While statements - Do statements - For Statements.

UNIT-III: ARRAYS AND STRINGS:
Arrays: Introduction - Defining an array - Initializing an array - One dimensional array – Two dimensional array - Dynamic array.
Strings: Introduction - Declaring and initializing string variables - Reading and Writing strings - String handling functions.

UNIT-IV: BUILT-IN FUNCTIONS AND USER-DEFINED FUNCTIONS:
Built–in functions: Mathematical functions - String functions - Character functions - Date functions. User defined functions: Introduction - Need for user defined functions - Elements of functions - Return values and their types - Function declaration - Function calls - Recursive functions.

UNIT-V: STRUCTURES AND POINTERS:
Structures: Introduction - Declaring structures variables - Accessing structure members - Functions and Structures - Array of structures - Enumerated Data types - Introduction to Unions.
Pointers: Fundamentals - Understanding pointers - Address - Declaration of Pointers.

LAB: PROGRAMS USING C.

SUGGESTED READINGS:

1. Programming in ANSCI C: Balaguruswamy, McGraw Hill.
2. Programming in C: Ashok Kamthane, Pearson.
3. C How to Program: P.J. Deitel & H.M. Deitel, Pearson & PHI.
4. Programming in C: K.S. Kahlon, Kalyani Publishers.
5. Fundamental of C: Dr. N. Guruprasad, Himalaya Publishing House.
6. C: Learning and Building Business and System Applications: Susant Rout, PHI.
7. Mastering C: K.R. Venugopal, McGraw Hill.
8. Programming in C: J.B. Dixit, Firewal Media.
9. The C Programming Language: B.W.Kernighan & D.M.Ritehie, PHI.
10. C: The Complete Reference: H.Schildt, McGraw Hill.
11. Let Us C: Y.Kanetkar, BPB.
12. C++ Spoken Tutorials by IIT Bombay

Paper: (BC 407): OBJECT ORIENTED PROGRAMMING IN C++

Paper: BC 407 Max. Marks: 70T + 30P
PPW: 4 (3T+2P) Exam Duration: 3 Hrs.
Credits : 4

Objective: *To gain skills of Object Oriented Programming using C++ Language.*

UNIT-I: INTRODUCTION:
Object Oriented Programming: Concepts – Benefits – Languages - Structured vs. Object Oriented Programming. C++: Genesis - Structure of a program – Tokens - Data Types – Operators - Control Structures - C vs C++ - Functions.

UNIT-II: CLASSES, OBJECTS, CONSTRUCTORS AND DESTRUCTORS:
Encapsulation - Hiding - Abstract data types - Object & Classes – Attributes - Methods - C++ class declaration - State identity and behaviour of an object. Purpose of Constructors - Default Constructor - Parameterized Constructors - Copy Constructor - Instantiation of objects - Default parameter value - Object types - C++ garbage collection - Dynamic memory allocation – Meta class / Abstract classes.

UNIT-III: OVERLOADING, CONVERSIONS, DERIVED CLASSES AND INHERITANCE:
Function and Operator Overloading - Overloading Unary and Binary Operators - Data and Type Conversions - Derived Classes - Concept of Reusability - Visibility modes - Types of Inheritance - Single and Multiple Inheritance - Multilevel Inheritance.

UNIT-IV: POLYMORPHISM, VIRTUAL FUNCTION, STREAMS AND FILES:
Polymorphism - Virtual - Classes - Pointer to Derived class - Virtual functions - Rules for Virtual function - Pure Virtual functions - Stream Classes - Types of I/O - Formatting Outputs - File Pointers – Buffer - C++ Stream - Unformatted console I/O operations – Functions: get( ) - put( ) – formatted console I /O operations - IOS class format functions - Manipulators.

UNIT–V: EXCEPTION HANDLING AND DATA STRUCTURES IN C++:
Exceptions in C++ Programs - Try and Catch Expressions - Exceptions with arguments. Data Structures: Introduction - Linked list - Stacks - Queues.

SUGGESTED READINGS:

1. Objected Oriented Programming with C++: E. Balagurusamy, McGraw Hill.
2. C++ Programming-A Practical Approach: Madhusudan Mothe, Pearson.
3. Object Oriented Programming Using C++: Chadha & Chadha, Kalyani.
4. Programming in C++: A. N. Kamthane, Pearson.
5. The Complete Reference C++: H. Schildt, McGraw Hill.
6. C++:How to Program: Deitel & Deitel, PHI.
7. Mastering C++: KR.Venugopal & R.Buyya, McGraw Hill.
8. Schaum's Outlines: Programming with C++: by John R Hubbard.
9. Object Oriented Programming using C++: Somashekara, PHI.
10. C++ Spoken Tutorials by IIT Bombay.

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Syllabus Revision Details for the Academic Year 2018-19

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

Dept. of Computer Science and Computer Applications						
Syllabus revision details for the academic year 2018-19						
S.NO	PROGRAMME NAME	YEAR	SEMESTER	No. OF COURSES	No. of COURSES CHANGED	JUSTIFICATION
1	BSC COMP.SCI	I	I	3	NIL	
2	B.A.C.A.	I	I	3	2	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
3	BCOM	I	I	3	NIL	
4	BSC COMP.SCI	I	II	3	NIL	
5	B.A.C.A.	I	II	3	2	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
6	BCOM	I	II	1	NIL	
7	BSC COMP.SCI	II	III	3	NIL	
8	BSC CA	II	III	1	NIL	
9	B.A.C.A.	II	III	1	NIL	
10	BCOM	II	III	1	NIL	
11	BSC COMP.SCI	II	IV	3	NIL	
12	BSC CA	II	IV	1	NIL	
13	B.A.C.A.	II	IV	1	NIL	
14	BCOM	II	IV	1	NIL	
15	BSC COMP.SCI	III	V	3	3	CBCS SYSTEM WAS INTRODUCED HENCE SYLLBUS CHANGED
16	BSC CA	III	V	1	1	
17	B.A.C.A.	III	V	1	1	
18	BCOM	III	V	1	1	
19	BSC CS	III	V	1	1	SEC PAPER INTRODUCED (COMPUTER ORGANIZATION)
20	BSC CS	III	V	1	1	GE PAPER INTRODUCED (INFORMATION TECHNOLOGIES-I)
21	BSC COMP.SCI	III	VI	3	3	CBCS SYSTEM WAS INTRODUCED HENCE SYLLBUS CHANGED
22	B.A.C.A.	III	VI	1	1	
23	BSC CA	III	VI	1	1	
24	BCOM	III	VI	1	1	
25	BSC CS	III	VI	1	1	GE PAPER INTRODUCED (INFORMATION TECHNOLOGIES-II)
				43	19	
TOTAL NUMBER OF COURES = 43						
NUMBER OF COURSES WITH SYLLABUS CHANGE = 19						
PERCENTAGE OF COURSES WITH SYLLABUS CHANGE= 44.2%						

FACULTY

19/43

INCHARGE

DEPARTMENT OF COMPUTER SCIENCE
Tara Government College (A)
Sangareddy, Sangareddy (Dist).

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

With Effect from the Academic Year 2016-2017

Syllabus for Computer Science

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC-3A	4T+2P=6	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC-3B	4T+2P=6	4 + 1 =5
	SEMESTER – III			
BS301	A: SciLab – 1 B: Boolean Algebra	SEC-1	2T	2
BS306	Data Structures	DSC-3C	4T+2P=6	4 + 1 =5
	SEMESTER – IV			
BS401	C: SciLab – 2 D: Digital Logic	SEC-2	2T	2
BS406	Database Management Systems	DSC-3D	4T+2P=6	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE-1	2	2
BS502	E: Python – 1 F: Computer Organization	SEC-3	2	2
BS505	Programming in Java	DSC-3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Operating Systems Elective–B: Software Engineering	DSE-1E DSE-2E	3T+2P=5	3 + 1 =4
	SEMESTER – VI			
BS601	Information Technologies –2	GE-2	2T	2
BS602	G: Python – 2 H: Information Security	SEC-4	2T	2
BS605	Computer Networks	DSC-3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP with MySQL Elective–B: Web Technologies	DSE-1F DSE-2F	3T+2P=5	3 + 1 =4
		Total Number of Credits		**48**

DEPARTMENT OF COMPUTERS
Tara Govt. Degree College (A)
Sangareddy, Sangareddy (Dist).

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

GE-1 Information Technologies – 1 BS501

Theory 2 Hours/Week 2 credits

Unit – I

Introduction to Computers: What is a Computer? Characteristics of Computers, Generations of Computers, Classification of Computers, Basic Computer Organization, Applications of Computers.
Input and Output Devices: Input Devices, Output Devices, Soft Copy Devices, Hard Copy Devices.
Computer Memory and Processors: introduction, Memory Hierarchy, Processor Registers, Cache Memory, Primary Memory, Secondary Storage Devices, Hard Disks, Optical Drives, USB Flash Drives, Memory Cards.

Unit – II

Computer Software: Introduction, Classification of Computer Software, System Software, Applications Software, Firmware, Middleware, Acquiring Computer Software.
Operating Systems: Introduction, Evolution of OS, Process Management, Memory Management, File Management, Device Management, Security Management, Command Interpreter, Windows, Linux.

Text Reema Thareja, *Fundamentals of Computers*

References
P. K. sinha, *Computer Fundamentals*
Anita Goel, *Computer Fundamentals*
V. Rajaraman, *Fundamentals of Computers*
E. Balagurusamy, *Fundamentals of Computers*
J. Glenn Brookshear, Dennis Brylow, *Computer Science An Overview*

Note: Student friendly video lecturers pertaining to this course are available at http://spoken-tutorial.org/
Teachers are advised to teach this courses in the computer lab itself, so that the interested students may derive some time to perform few programs their own.

SEC-3 [B]

Computer Organization

BS502

Theory 2 Hours/Week 2 credits

Unit – I

Latches and Flip-Flops: Introduction, Set-Reset Latch, Gated Latches, Edge-Triggered D Flip-Flop, S-R Flip-Flop, J-K Flip-Flop, T Flip-Flop, Flip-Flops with Additional Inputs, Asynchronous Sequential Circuits.
Registers and Counters: Registers and Register Transfers, Shift Registers, Design of Binary Counters, Counter Design Using D Flip-Flops, Counter Design Using S-R and J-K Flip-Flops, Derivation of Flip-Flop Input Equations.

Unit – II

Sequential Circuit Design: Design Example—Code Converter, Design of Iterative Circuits, Design of Sequential Circuits Using ROMs and PLAs, Simulation and Testing of Sequential Circuits, Computer-Aided Design.
Circuits for Arithmetic Operations: Serial Adder with Accumulator, Design of a Binary Multiplier, Design of a Binary Divider.

Text

Charles H. Roth, Jr. and Larry L. Kinney, *Fundamentals of Logic Design (7e)*

References

M. Morris Mano, Michael D. Ciletti, *Digital Design (4e)*
A. Saha and N. Manna, *Digital Principles and Logic Design*
M. Rafiquzzaman, *Fundamentals of Digital Logic and Microcontrollers (6e)*
Elliott Mendelson, *Theory and Problems of Boolean Algebra and Switching Circuit*
M. Morris Mano, Charles R. Kime, Tom Martin, *Logic and Computer Design Fundamentals*

DSC–3E Programming in Java BS505

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Type Conversion, Casting, Conditional Statements, Loops, Branching Mechanism, Classes, Objects, Class Declaration, Creating Objects, Method Declaration and Invocation, Method Overloading, Constructors–Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects, Class Variables & Methods-static Keyword, this Keyword, One-Dimensional Arrays, Two-Dimensional Arrays, Command-Line Arguments, Inner Class.

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keywords, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

Unit – II

Packages–Creating and Using Packages, Access Protection, Wrapper Classes, String Class, StringBuffer Class.

Exception: Introduction, Types, Exception Handling Techniques, User-Defined Exception.

Multithreading: Introduction, Main Thread, Creation of New Threads – By Inheriting the Thread Class or Implementing the Runnable Interface, Thread Lifecycle, Thread Priority, Synchronization.

Input/Output: Introduction, java.io Package, File Class, FileInputStream Class, FileOutputStream Class, Scanner Class, BufferedInputStream Class, BufferedOutputStream Class, RandomAccessFile Class.

Unit – III

Applets: Introduction, Example, Life Cycle, Applet Class, Common Methods Used in Displaying the Output.

Event Handling: Introduction, Types of Events, Example. AWT: Introduction, Components, Containers, Button, Label, Checkbox, Radio Buttons, Container Class, Layouts. Swing: Introduction, Differences between Swing and AWT, Jframe, Japplet, Jpanel, Components in Swings, Layout Managers, Jtable, Dialog Box.

Database Handling Using JDBC: Introduction, Types of JDBC Drivers, Load the Driver, Establish Connection, Create Statement, Execute Query, Iterate Resultset, Scrollable Resultset, Developing a JDBS Application.

Text

Sachin Malhotra, Saurabh Choudhary, *Programming in Java (2e)*

References

Bruce Eckel, *Thinking in Java (4e)*
Herbert Schildt, *Java: The Complete Reference (9e)*
Y. Daniel Liang, *Introduction to Java Programming (10e)*
Paul Deitel, Harvey Deitel, *Java: How To Program (10e)*
Cay S. Horsttnann, *Core Java Volume I – Fundamentals (10e)*
C. Thomas Wu, *An introduction to object-oriented programming with Java (5e)*
Tony Gaddis, *Starting Out with Java From Control Structures Through Objects (6e)*
Jeanne Boyarsky, Scott Selikoff, *OCA: Oracle Certified Associate Java SE 8 Programmer–I Study Guide*

DSE-1E Operating Systems BS506

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Introduction: Computer-System Architecture, Computing Environments.
Operating-System Structures: Operating-System Services, User Interface for Operating-System, System Calls, Types of System Calls, Operating System Structure.
Process Management: Process Concept, Process Scheduling, Operations on Processes, Inter process Communication, Examples–Producer-Consumer Problem.
Process Synchronization: Critical-Section Problem, Peterson's Solution, Synchronization, Semaphores, Monitors.

Unit – II

CPU Scheduling: Concepts, Scheduling Criteria, Scheduling Algorithms.
Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

Unit – III

Main Memory: Introduction, Swapping, Contiguous Memory Allocation, Segmentation, Paging.
Virtual Memory: Introduction, Demand Paging, Page Replacement, Allocation of Frames, Thrashing.
Mass-Storage Structure: Overview, Disk Scheduling, RAID Structure.
File Systems: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, Protection.
File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

Text

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Concepts (9e)*

References

Naresh Chauhan, *Principles of Operating Systems*
Thomas W. Doeppner, *Operating Systems in Depth*
Andrew S. Tanenbaum, *Modern Operating Systems*
William Stallings, *Operating Systems – Internals and Design Principles*
Dhananjay M. Dhandhere, *Operating Systems – A Concept Based Approach*

GE-2 Information Technologies – 2 BS601

Theory 2 Hours/Week 2 credits

Unit – I

Introduction to Algorithms and Programming Languages: Algorithm, Control Structures, Flowcharts, Pseudo code, Programming Languages, Generations of Programming Languages.
Database Systems: File Oriented Approach, Database Oriented Approach, Database Views, Three-Schema Architecture, Database Models, Components of DBMS, Introduction of SQL Queries.

Unit – II

Computer Networks: Introduction, Connection Media, Data Transmission Mode, Data Multiplexing, Data Switching, Network Topologies, Types of Networks, Networking Devices, OSI Model.
The Internet: Internet Services, Types of Internet Connections, Internet Security.
Emerging Computer Technologies: Distributed Networking, Peer-to-peer Computing, Grid Computing, Cloud Computing, Utility Computing, On0demand Computing, Wireless Network, Bluetooth, Artificial Intelligence.

Text Reema Thareja, *Fundamentals of Computers*

References
P. K. sinha, *Computer Fundamentals*
Anita Goel, *Computer Fundamentals*
V. Rajaraman, *Fundamentals of Computers*
E. Balagurusamy, *Fundamentals of Computers*
J. Glenn Brookshear, Dennis Brylow, *Computer Science An Overview*

Note: Student friendly video lecturers pertaining to this course are available at http://spoken-tutorial.org/
Teachers are advised to teach this courses in the computer lab itself, so that the interested students may derive some time to perform few programs their own.

DSC-3F Computer Networks BS605

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit - I

Introduction: Data Communication Components, Line Configuration, Topologies, Transmission Mode, Categories of Networks, ISO Reference Model-Layered Architecture, Functions of Layers, TCP/IP Reference Model.

Transmission Media: Guided Media-Twisted Pair Cable, Coaxial Cable, Optical Fiber, Unguided Media-Satellite Communication, and Cellular Telephony.

Multiplexing: Frequency-Division Multiplexing, Time-Division Multiplexing.

Unit - II

Data Link Layer: Error Detection-VRC, LRC, CRC, Checksum, Error Correction-Hamming Code, Burst Error Correction, Line Discipline-ENQ/ACK, Poll/Select, Flow Control-Stop-and-Wait, Sliding Window, Error Control-Stop-and-Wait ARQ, Sliding Window ARQ Go-Back-n ARQ, Selective-Reject ARQ.

Local Area Networks: Introduction to IEEE 802, Ethernet-CSMA/CD, Implementation, Token Ring,-Token Passing, Implementation.

Switching: Circuit Switching, Packet Switching, Message Switching.

Unit - III

Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Brouters, Switches, Distance Vector Routing Algorithm, Link State Routing Algorithm.

Transport Layer: Duties of Transport Layer, Connection.

Upper OSI Layers; Session Layer, Presentation Layer, Application Layer.

Text

Behrouz A. Forouzan, *Data Communication and Networking (2e Update)*

References

S.S. Shinde, *Computer Networks*

William Stallings, *Data and Computer Communications*

Andrew S. Tanenbaum, David J Wetherall, *Computer Networks*

Behrouz A Forouzan, Firouz Mosharraf, *Computer Networks A Top-Down Approach*

James F. Kurose, Keith W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*

DSE-2F Web Technologies BS606

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Structuring Documents for the Web: Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Phrase Elements, Lists, Editing Text, Core Elements and Attributes, Attribute Groups
Links and Navigation: Basic Links, Creating Links with the <a> Element, Advanced E- mail Links.
Images, Audio, and Video: Adding Images Using the <img> Element, Using Images as Links Image Maps, Choosing the Right Image Format, Adding Flash, Video and Audio to your web pages.
Tables: Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables
Forms: Introducing Forms, Form Controls, Sending Form Data to the Server
Frames: Introducing Frameset, <frame> Element, Creating Links Between Frames, Setting a Default Target Frame Using <base> Element, Nested Framesets, Inline or Floating Frames with <iframe>.

Unit – II

Cascading Style Sheets: Introducing CSS, Where you can Add CSS Rules.
CSS Properties: Controlling Text, Text Formatting, Text Pseudo Classes, Selectors, Lengths, Introducing the Box Model.
More Cascading Style Sheets: Links, Lists, Tables, Outlines, The :focus and :activate Pseudo classes Generated Content, Miscellaneous Properties, Additional Rules, Positioning and Layout with CSS
Page Layout: Understating the Site's Audience, Page Size, Designing Pages, Coding your Design, Developing for Mobile Devices.
Design Issues: Typography, Navigation, Tables, Forms.

Unit – III

Learning JavaScript: How to Add Script to Your Pages, the Document Object Model, Variables, Operators, Functions, Control Statements, Looping, Events, Built- In Objects,
Working with JavaScript: Practical Tips for Writing Scripts, Form Validation, Form Enhancements, JavaScript Libraries.
Putting Your site on the web: Meta tags, Testing your site, Talking the Leap to Live, Telling the World about your site, Understanding your visitors.

Text Jon Duckett, *Beginning HTML, XTML, CSS and JavaScript*

References
Chris Bates, *Web Programming*
M. Srinivasan, *Web Technology: Theory and Practice*
Achyut S. Godbole, Atul Kahate, *Web Technologies*
Kogent Learning Solutions Inc, *Web Technologies Black Book*
Ralph Moseley and M. T. Savaliya, *Developing Web Applications*
P.J. Deitel & H.M. Deitel, *Internet and World Wide Web How to program*

Syllabus for Computer Applications

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+2P=6	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+2P=6	4 + 1 =5
	SEMESTER – III			
BS301	A: SciLab – 1 B: Python – 1	SEC–1	2T	2
BS306	Relational Database Management Systems	DSC–3C	4T+2P=6	4 + 1 =5
	SEMESTER – IV			
BS401	C: SciLab – 2 D: Python – 2	SEC–2	2T	2
BS406	Computer Networks	DSC–3D	4T+2P=6	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE–1	2	2
BS502	E: R Basics – 1 F: Ruby	SEC–3	2	2
BS505	Multimedia Systems	DSC–3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Web Technologies Elective–B: Visual Programming	DSE–1E DSE–2E	3T+2P=5	3 + 1 =4
	SEMESTER – VI			
BS601	Information Technologies –2	GE–2	2T	2
BS602	G: R Basics – 2 H: Ruby on Rails	SEC–4	2T	2
BS605	Mobile Applications	DSC–3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP Programming Elective–B: Information Security and Cyber Laws	DSE–1F DSE–2F	3T+2P=5	3 + 1 =4
		Total Number of Credits		**48**

DSC-3E Multimedia Systems BS505

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality; Delivering Multimedia.
Text: Meaning, Fonts and Faces, Using Text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hypertext.
Images: Before You Start to Create, Making Still Images, Color.

Unit – II

Sound: The Power of Sound, Digital Audio, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Audio File Formats. Adding Sound to Your Multimedia Project.
Animation: The Power of Motion, Principles of Animation, Animation by Computer, Making Animations.
Video: Using Video, How Video Works and Is Displayed, Digital Video Containers, Obtaining Video Clips, Shooting and Editing Video.

Unit – III

Making Multimedia: The Stages of a Multimedia Project, the Intangibles, Hardware, Software, Authoring Systems.
The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.
Designing for the World Wide Web: Developing for the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web, Video for the Web.

Text Tay Vaughan, *Multimedia: Making it work (8e)*

References
Keyes, *Multimedia Handbook*
K. Andleigh, K. Thakkar, *Multimedia System Design*
Ralf Steinmetz, Klara Naharstedt, *Multimedia: Computing, Communications Applications*
Student friendly video lecturers pertaining to this course are available at
http://spoken-tutorial.org/

DSC-3F Mobile Applications BS605

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Introduction to Programming and App Inventor: Introduction, What Is a Computer Program? Introducing App Inventor, Getting Hands-On with App, Tutorial 1-1,1-2,1-3,1-4 Working with Media: Displaying Images, Tutorial 2-1,2-2,2-3,Duplicating Blocks and Using Dropdowns, Sounds, Color Blocks, Layout Components, Tutorial 2-7 Input, Variables, and Calculations: The Text Box Component, Performing Calculations, Tutorial 3-1, 3-2 ,Storing Data with Variables Tutorial 3-3, Creating Blocks with Type blocking, Math Functions.

Unit – II

Decision Blocks and Boolean: Introduction to Decision Blocks, Relational Operators and the if Block, Tutorial 4-1, The if then else Block Tutorial 4-2, A First Look At Comparing Strings, Logical Operators, Tutorial 4-4, Nested Decision Blocks, Tutorial 4-5 The if then else if Block, The Screen's Initialize Event, The ListPickerComponent, The CheckBox Component, Repetition Blocks, Times, and Dates: The Notifier Component, The while Loop, Tutorial 5-1, The for each Loop Tutorial 5-2, The Clock Component, The DatePicker Component Procedures and Functions.

Unit – III

Lists -Graphics and Animation: The Canvas Component, Tutorial 9-1, The Ball and ImageSprite Component, Tutorial 9-2, 9-3,Using the Clock Component to Create AnimationsWorking with Text: Concatenating Strings, Comparing Strings, Trimming a String, Converting Case, Finding a Substring Tutorial 10-3,Replacing a Substring , Extracting a Substring, Splitting a Substring Text to Speech and Text Messaging.

Text Tony Gaddis, Rebecca Halsey, *Starting Out with App Inventor for Android (1e)*

References

Mark L. Murphy, *Beginning Android*
J.F. DiMarzio, *Android – A Programmer's Guide*
W Frank Ableson, Robi Sen, Chris King, *Android in Action*
Lucas Jordan, Pieter Greyling, *Practical Android Projects*
http://appinventor.mit.edu/

With Effect from the Academic Year 2016-2017

Syllabus for Computer Applications

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+2P=6	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+2P=6	4 + 1 =5
	SEMESTER – III			
BS301	A: SciLab – 1 / B: Python – 1	SEC–1	2T	2
BS306	Relational Database Management Systems	DSC–3C	4T+2P=6	4 + 1 =5
	SEMESTER – IV			
BS401	C: SciLab – 2 / D: Python – 2	SEC–2	2T	2
BS406	Computer Networks	DSC–3D	4T+2P=6	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE–1	2	2
BS502	E: R Basics – 1 / F: Ruby	SEC–3	2	2
BS505	Multimedia Systems	DSC–3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Web Technologies	DSE–1E	3T+2P=5	3 + 1 =4
	Elective–B: Visual Programming	DSE–2E		
	SEMESTER – VI			
BS601	Information Technologies –2	GE–2	2T	2
BS602	G: R Basics – 2 / H: Ruby on Rails	SEC–4	2T	2
BS605	Mobile Applications	DSC–3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP Programming	DSE–1F	3T+2P=5	3 + 1 =4
	Elective–B: Information Security and Cyber Laws	DSE–2F		
		Total Number of Credits		**48**

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DSC-3E Multimedia Systems BS505

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality; Delivering Multimedia.
Text: Meaning, Fonts and Faces, Using Text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hypertext.
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Unit – II

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Unit – III

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The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.
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DSC-3F Mobile Applications BS605

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Introduction to Programming and App Inventor: Introduction, What Is a Computer Program? Introducing App Inventor, Getting Hands-On with App, Tutorial 1-1,1-2,1-3,1-4 Working with Media: Displaying Images, Tutorial 2-1,2-2,2-3,Duplicating Blocks and Using Dropdowns, Sounds, Color Blocks, Layout Components, Tutorial 2-7 Input, Variables, and Calculations: The Text Box Component, Performing Calculations, Tutorial 3-1, 3-2 ,Storing Data with Variables Tutorial 3-3, Creating Blocks with Type blocking, Math Functions.

Unit – II

Decision Blocks and Boolean: Introduction to Decision Blocks, Relational Operators and the if Block, Tutorial 4-1, The if then else Block Tutorial 4-2, A First Look At Comparing Strings, Logical Operators, Tutorial 4-4, Nested Decision Blocks, Tutorial 4-5 The if then else if Block, The Screen's Initialize Event, The ListPickerComponent, The CheckBox Component, Repetition Blocks, Times, and Dates: The Notifier Component, The while Loop, Tutorial 5-1, The for each Loop Tutorial 5-2, The Clock Component, The DatePicker Component Procedures and Functions.

Unit – III

Lists -Graphics and Animation: The Canvas Component, Tutorial 9-1, The Ball and ImageSprite Component, Tutorial 9-2, 9-3,Using the Clock Component to Create AnimationsWorking with Text: Concatenating Strings, Comparing Strings, Trimming a String, Converting Case, Finding a Substring Tutorial 10-3,Replacing a Substring , Extracting a Substring, Splitting a Substring Text to Speech and Text Messaging.

Text Tony Gaddis, Rebecca Halsey, *Starting Out with App Inventor for Android (1e)*

References

Mark L. Murphy, *Beginning Android*
J.F. DiMarzio, *Android – A Programmer's Guide*
W Frank Ableson, Robi Sen, Chris King, *Android in Action*
Lucas Jordan, Pieter Greyling, *Practical Android Projects*
http://appinventor.mit.edu/

THIRD YEAR:					
SEMESTER-V					
29.	BC501	Practice of General Insurance	SEC-3	2	2
30.	BC502	Introduction to Indian Economy	GE-1	2	2
31.	BC503	Cost Accounting	DSC	4	4
32.	BC504	Business Law	DSC	4	4
33.	BC505	Banking Theory & Practice	DSC	4	4
34.	BCC506	Excel Foundation	**DSC**	**4T+2P**	**4**
35.	**BCC507 (a)** **BCC507 (b)**	**Computerised Accounting/** **Business Analytics**	**DSE** **DSE**	**4T+2P** **5**	**5** **5**
36.	**BCC508 (a)** **BCC508 (b)**	**Web Technology/** **Business Simulation**	**DSE** **DSE**	**4T+2P** **5**	**5** **5**
		Total		**32/34**	**30**
SEMESTER-VI					
37.	BC601	Regulation of Insurance Business	SEC-4	2	2
38.	BC602	Sectors of Indian Economy	GE-2	2	2
39.	BC603	Theory and Practice of GST	DSC	3T+2P	4
40.	BC604	Company Law	DSC	4	4
41.	BC605	Managerial Accounting	DSC	4	4
42.	BC606	Commerce Lab	DSC	2T+4P	4
43.	**BCC607** **BCC607**	**E-Commerce/** **Business Forecasting**	**DSE** **DSE**	**4T+2P** **5**	**5** **5**
44.	**BCC608** **BCC608**	**Management Information Systems/** **Business Analytics Programming**	DSE DSE	4T+2P 5 **33/25**	5 5 **30**
		GRAND TOTAL		**189**	**180**

AECC: Ability **E**nhancement **C**ompulsory **C**ourse; ***SEC: S**kill **E**nhancement **C**ourse; **DSC: D**iscipline **S**pecific **C**ourse; **DSE: D**iscipline **S**pecific **E**lective; **GE: G**eneric **E**lective; T=Theory; P=Practicals;*

SUMMARY OF CREDITS

Sl. No.	Course Category	No. of Courses	Credits Per Course	Credits
1	AECC	2	2	4
2	SEC	4	2	8
3	CC Language **DSC**	8 **8** **16**	5 **5** **4**	40 **40** **64**
4	**DSE**	**4**	**5**	**20**
5	GE	2	2	4
	TOTAL	**44**		**180**
	Commerce Total	**28**		**124**

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Paper : (BCCA 506) :EXCEL FOUNDATION

Paper: BCCA 506 Max. Marks: 80+20
THPW: 5 (4T+2P) Exam Duration: 3 Hrs

Objective: Students will learn how to start working with M S Excel right from basics to Tables, Templates and Printing of their work.

UNIT-I: **INTRODUCTING EXCEL:** Workbooks and Worksheets, Moving Around a Worksheet, Ribbon tabs, Types of commands on the Ribbon, Using Shortcut Menus, Working with Dialogue Boxes, Task Panes, Getting started on your worksheet, Creating a chart, Printing your worksheet, Saving your worksheet, Exploring Data Types, Modifying Cell Contents, Deleting, Replacing, Editing of a cell. Some handy data entry techniques, Number Formatting.

UNIT-II: **WORKSHEET OPERATIONS:** Moving and resizing windows, Switching among windows, Activating a worksheet, Adding, Deleting a worksheet, Changing a sheet tab color, Rearranging your worksheets, Hiding, un-hiding a worksheet, Worksheet View, Comparing sheets side by side, Selecting ranges, complete rows and columns, noncontiguous ranges, multi-sheet ranges, special types of cells. Copying or Moving Ranges. Paste Special dialogue box, Adding comments to cells.

UNIT-III: **TABLES AND FORMATTING:** Creating a Table, Changing the Look of a Table, Navigating in a Table, Selecting parts of a Table, Adding, Deleting new rows or columns, Moving a Table, Working with the Total Row, Removing duplicate rows from a table. Sorting and filtering a table, Converting Table into Range. Formatting tools on the Home tab, Mini Toolbar, Fonts, Text Alignment, Wrapping text to fit a cell, Colors and Shading, Borders and Lines. Naming Styles.

UNIT–IV: **EXCEL FILES & TEMPLATES:** Creating a New Workbook, Filtering filenames, Saving and Auto Recovery, Password-Protecting a Workbook, Recovering unsaved work, Protect Workbook options, Checking Compatibility. Creating a Excel Templates, Modifying a template, Custom Excel Templates, Default Templates, Editing your Template, Resetting the default workbook, Saving your Custom Templates, Getting ideas for creating Templates.

UNIT–V: **PRINTING YOUR WORK:** Normal, Page Layout, Page Break View, Choosing your printer, Specifying what you want to print, Changing Page Orientation, Specifying paper size, Adjusting page margins, Inserting a page break, Removing manual page breaks, Printing Row and Column Titles, Scaling printed output, Header or Footer Options, Preventing certain cells, Objects from being printed, Creating Custom Views of your Worksheet. Creating PDF files.

Introducing Excel:

SUGGESTED READINGS:

1. Excel 2013 Bible: John Walkenbach, Wiley.
2. Microsoft Excel 2013: Data Analysis and Business Modeling: Winston, PHI
3. Excel Data Analysis - Modeling and Simulation: Hector Guerrero, Springer.
4. Excel Functions and Formulas: Bernd Held, BPB Publications.
5. Financial Analysis and Modeling using Excel and VBA: Chandan Sengupta, Wiley

BC 508 (a): WEB TECHNOLOGIES

Paper: BC508 (a)
PPW: 5 (4T + 2P)

Max. Marks: 80+20
Exam Duration: 3 Hrs

Objective: *to gain skills of usage of Web Technologies to design Web pages.*

UNIT-I: INTRODUCTION:
Art of creating a web site - Markup language (HTML) – Hypertext - Formatting text - Forms & formulating instructions & formulation elements – Commenting code – Anchors - Back grounds – Images - Hyperlinks – Lists –Tables – Frames - Web design principles.

UNIT-II: AN OVER VIEW OF DYNAMIC WEB PAGES & DYNAMIC WEB PAGE:
An over view of dynamic web pages and dynamic web page technologies: Introduction to Dynamic HTML programing - Cascading style sheets (CSS) - Basic syntax and structure -Events handling - Changing Text and Attributes - Dynamically changing style - Text Graphics and placements - Creating multimedia effects with filters and Transactions.

UNIT-III: JAVA SCRIPT:
Introduction - Client side Java script - Server side Java script - Core features - Data types and variables – Operators - Expressions and statements – Functions – Objects – Array - Date and math related objects - Document object model - Event handling.

UNIT-IV: EVENTS AND EVENT HANDLERS:
General information about Events – Event – OnAbort – OnClick - Ondbl click - Ondrag drop – Onerror - Onfocus - Onkey Press – Onkey Up – Onload - Onmouse Down – Onmouse Move - Onmouse Out – Onmouse Over - Onmove - Onrest – Onresize - Onselect - On submit - Onunload.

UNIT-V: EXTENSIBLE MARKUP LANGUAGE (XML):
Introduction - Creating XML Documents - XML style Sheet - Hyperlinksin XML Document Object Model - XML Query Language.

LAB WORK: CREATING A WEBSITE WITH DYNAMIC FUNCTIONALITY USING CLIENT- SIDE AND SERVER SIDE SCRIPTING.

SUGGESTED READINGS:
1. Web Technology: Pradeep Kumar, HPH
2. Internet & World Wide Web How to Program: Deitel & Deitel, Pearson.
3. Web programming: Chris Bates.
4. HTML & XML An Introduction NIIT, PHI.
5. HTML for the WWW with XHTML & CSS: Wlizabeth Castro, Pearson
6. Internet and Web Technologies: Raj Kamal, McGraw Hill.
7. Web Technology: A Developer's Perspective: Gopalan & Sivaselvan, PHI.
8. The Complete Reference PHP: S. Holzner, McGraw Hill.
9. Internet Technology and Web Page Design: R.Singh&M.Sonia, Kalyani.
10. Web Programming using PHP and MySQL: A.Babu, K.Meena & Sivakumar, HPH.
11. Web Technology and Design by Xavier, New Age International Pub.

Paper : (BCC 607) (a): E-COMMERCE

Paper: BCC607 (a) **Max Marks: 80+20**
PPW: 5 (4T + 2P) **Exam Duration: 3 Hrs**
Objective: *to acquire conceptual and application knowledge of ecommerce.*

UNIT-I: INTRODUCTION:
E-Commerce: Meaning - Advantages & Limitations - E-Business: Traditional & Contemporary Model, Impact of E-Commerce on Business Models - Classification of E-Commerce: B2B - B2C - C2B - C2C - B2E - Applications of Ecommerce: E-Commerce Organization Applications - E-Marketing - E-Advertising - E-Banking - Mobile Commerce - E-Trading - E-Learning - E-Shopping.

UNIT-II: FRAMEWORK OF E-COMMERCE:
Framework of E-Commerce: Application Services - Interface Layers - Secure Messaging - Middleware Services and Network Infrastructure - Site Security - Firewalls & Network Security - TCP/IP – HTTP - Secured HTTP – SMTP - SSL.
Data Encryption: Cryptography – Encryption – Decryption - Public Key - Private Key - Digital Signatures - Digital Certificates.

UNIT-III: CONSUMER ORIENTED E-COMMERCE APPLICATIONS:
Introduction - Mercantile Process Model: Consumers Perspective and Merchant's Perspective - Electronic Payment Systems: Legal Issues & Digital Currency - E-Cash & E-Cheque - Electronic Fund Transfer (EFT) - Advantages and Risks - Digital Token-Based E-Payment System - Smart Cards.

UNIT-IV: ELECTRONIC DATA INTERCHANGE:
Introduction - EDI Standards - Types of EDI - EDI Applications in Business – Legal - Security and Privacy issues if EDI - EDI and E-Commerce - EDI Software Implementation.

UNIT-V: E-MARKETING TECHNIQUES:
Introduction - New Age of Information - Based Marketing - Influence on Marketing - Search Engines & Directory Services - Charting the On-Line Marketing Process - Chain Letters - Applications of 5P's (Product, Price, Place, Promotion, People) E-Advertisement - Virtual Reality & Consumer Experience - Role of Digital Marketing.

Lab work: *Using Microsoft Front Page Editor and HTML in Designing a Static Webpage/Website.*

SUGGESTED READINGS:

1. Frontiers of Electronic Commerce: Ravi Kalakota, Andrew B Whinston, Pearson
2. E-Commerce: Tulasi Ram Kandula, HPH.
3. E-Commerce: An Indian Perspective: P.T. Joseph, S.J, PHI
4. Electronic Commerce, Framework Technologies & Applications: Bharat Bhasker, McGraw Hill
5. Introduction To E-Commerce: Jeffrey F Rayport, Bernard J. Jaworski: Tata McGraw Hill
6. Electronic Commerce, A Managers' Guide: Ravi Kalakota, Andrew B Whinston
7. E-Commerce & Computerized Accounting: Rajinder Singh, Er. Kaisar Rasheed, Kalyani
8. E-Commerce & Mobile Commerce Technologies: Pandey, Saurabh Shukla, S. Chand
9. E-Business 2.0, Roadmap For Success: Ravi Kalakota, Marcia Robinson, Pearson
10. Electronic Commerce: Pete Loshin / John Vacca, Firewall Media
11. E-Commerce, Strategy, Technologies And Applications : David Whiteley, Tata Mcgraw Hill
12. Digital Commerce and Its Applications (Student's Handbook): K Goyal, Kalyani Publication

Paper : (BCC 608) (a): MANAGEMENT INFORMATION SYSTEM

Paper: BCC 608 (a) Max Marks: 80+20
PPW: 5 Exam Duration: 3hrs

Objective: *To equip the students with finer nuances of MIS.*

UNIT-I: AN OVERVIEW OF MANAGEMENT INFORMATION SYSTEMS (MIS):
Concept & Definition of MIS - MIS Vs. Data Processing - MIS & Decision Support Systems - MIS & Information Resources Management - End User Computing – MIS Structure - Managerial View of IS – Functions of Management - Management Role - Levels of Management.

UNIT-II: FOUNDATION OF INFORMATION SYSTEMS:
Introduction to Information System in Business - Fundamentals of Information Systems - Solving Business Problems with Information Systems - Types of Information Systems, Effectiveness and Efficiency Criteria in Information System - Frame Work For IS - Sequence of Development of IS.

UNIT-III: CONCEPT OF PLANNING & CONTROL:
Concept of Organizational Planning - Planning Process - Computational Support for Planning - Characteristics of Control Process - Nature of Control in an Organization.
IS Planning – Determination of Information Requirements - Business Systems Planning - End Means Analysis - Organizing the Plan.

UNIT-IV: BUSINESS APPLICATIONS OF INFORMATION TECHNOLOGY:
Internet & Electronic Commerce – Intranet - Extranet & Enterprise Solutions - Information System for Business Operations - Information System for Managerial Decision Support - Information System for Strategic Advantage.

UNIT-V: ADVANCED CONCEPTS IN INFORMATION SYSTEMS:
Enterprise Resource Planning - Supply Chain Management - Customer Relationship Management and Procurement Management - Systems Analysis and Design – System Development Life Cycle – Prototyping – Sad - Project Management - Cost Benefit Analysis - Detailed Design - Implementation.

SUGGESTED READINGS:

1. Management Information System: CVS. Murthy, HPH.
2. Management Information System: O Brian, TMH.
3. Management Information System: Gordon B.Davis & Margrethe H.Olson, TMH.
4. Information System for Modern Management: Murdick, PHI.
5. Management Information System: Jawadekar, TMH.

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Syllabus Revision Details for the Academic Year 2019-20

Dept. of Computer Science and Computer Applications						
Syllabus revision details for the academic year 2019-20						
S.NO	PROGRAMME NAME	YEAR	SEM	No. OF COURSES	No. of COURSES CHANGED	JUSTIFICATION
1	BSC COMP.SCI	I	I	3	NIL	
2	BSC CA	I	I	1	1	NEW PROGRAMS WAS INTRODUCED UNDER CBCS
3	B.A.C.A.	I	I	2	NIL	
4	BCOM	I	I	2	2	NEW PROGRAMS WAS INTRODUCED UNDER CBCS AND IT WAS REPLACED WITH FIT
5	BSC COMP.SCI	I	II	3	NIL	
6	BSC CA	I	II	1	1	NEW PROGRAMS WAS INTRODUCED UNDER CBCS
7	B.A.C.A.	I	II	2	NIL	
8	BCOM	I	II	2	2	NEW PROGRAMS WAS INTRODUCED UNDER CBCS AND RDBMS WAS REPLACED WITH PROGRAMMING WITH C & C++
9	BSC COMP.SCI	II	III	3	NIL	
10	B.A.C.A.	II	III	3	2	TWO NEW PROGRAMS WERE INTRODUCED
11	BCOM	II	III	1	1	PROGRAMMING IN C WAS REPLACED WITH RDBMS
12	BSC COMP.SCI	II	IV	3	NIL	
13	B.A.C.A.	II	IV	3	3	TWO NEW PROGRAMS WERE INTRODUCED AND COMPUTER NETWORK WAS REPLACED WITH MULTIMEDIA SYSTEM
14	BCOM	II	IV	1	1	OOPS WAS REPALCED WITH WEB TECHNOLOGIES
15	BSC COMP.SCI	III	V	6	NIL	
16	BSC CS	III	V	1	NIL	
17	BSC CS	III	V	1	NIL	
18	BSC CA	III	V	2	NIL	
19	B.A.C.A.	III	V	2	NIL	
20	BCOM	III	V	2	NIL	
21	BSC COMP.SCI	III	VI	6	NIL	
22	BSC CA	III	VI	2	NIL	
23	B.A.C.A.	III	VI	2	NIL	
24	BCOM	III	VI	2	NIL	
25	BSC CS	III	VI	1	NIL	
				57	13	
TOTAL NUMBER OF COURES = 57						
NUMBER OF COURSES WITH SYLLABUS CHANGE = 13						
PERCENTAGE OF COURSES WITH SYLLABUS CHANGE= 22.80%						

FACULTY 13/57

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OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc (Computer Applications)
CBCS Pattern with Effect from the Academic Year 2019-2020

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+3P=7	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+3P=7	4 + 1 =5
	AECC			
BS107	Fundamentals of Computers	AECC	2T	2
	SEMESTER – III			
BS301	Communication Skills(or) Professional Skills (Sec –I)	SEC–1	2T	2
BS302	Python – 1 (Sec –II)	SEC–2	2T	2
BS306	Relational Data Base Management Systems	DSC–3C	4T+3P=7	4 + 1 =5
	SEMESTER – IV			
BS401	Leadership & Management Skill (or) (Sec –III) Universal Human Values	SEC–3	2T	2
BS402	Python – 2 (Sec –IV)	SEC–4	2T	2
BS406	Multi Media Systems	DSC–3D	4T+3P=7	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies	GE	4T	4
BS505	Programming in Java	DSE–3E	4T+3P=7	4 + 1 =5
	SEMESTER – VI			
BS605	Web Technologies	DSE–3F	4T+3P=7	4 + 1 =5
	Project/Optional			
BS601	Information Security and Cyber Laws	PO	3T+3P=6	3 + 1 =4
		Total Number of Credits		**48**

Prof.G.Kamala
Chairperson Board of Studies in Computer Science, OU

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – I
Programming in C

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS, Operational Overview of a CPU.
Program Fundamentals: Generation and Classification of Programming Languages, Compiling, Interpreting, Loading, Linking of a Program, Developing Program, Software Development.
Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.
Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,
Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.
Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h,

Unit – III

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.
Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Dynamic Memory Allocation.

Unit – IV

User-defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Structures verses Unions, Enumeration Types.
Files: Introduction, Using Files in C, Working with Text Files and Binary Files, Other File Management Functions.

Textbook: Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)
References:

1. Ivor Horton, Beginning C
2. Ashok Kamthane, Programming in C
3. Herbert Schildt, The Complete Reference C
4. Paul Deitel, Harvey Deitel, C How to Program
5. Byron S. Gottfried, Theory and Problems of Programming with C
6. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language
7. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – II
Programming in C++

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Searching and Sorting Arrays.
Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.

Unit – II

Object Oriented Programming: Procedural and Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.
Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Separating Class Specification from Implementation, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friends of Classes, Member-wise Assignment, Copy Constructors, Operator Overloading.

Unit – III

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructors and Destructors in Base and Derived Classes, Redefining Base Class Functions, Polymorphism and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.
C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Extracting Data from the Exception Class, Re-throwing an Exception.
Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Templates and Inheritance.

Textbook: Tony Gaddis, Starting out with C++: from control structures through objects (7e)
References:

1. B. Lippman, C++ Primer
2. Bruce Eckel, Thinking in C++
3. K.R. Venugopal, Mastering C++
4. Herbert Schildt, C++: The Complete Reference
5. Bjarne Stroustrup, The C++ Programming Language
6. Sourav Sahay, Object Oriented Programming with C++TEXT BOOK:

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc (Computer Applications)
CBCS Pattern with Effect from the Academic Year 2019-2020

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+3P=7	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+3P=7	4 + 1 =5
	AECC			
BS107	Fundamentals of Computers	AECC	2T	2
	SEMESTER – III			
BS301	Communication Skills(or) Professional Skills (Sec –I)	SEC–1	2T	2
BS302	Python – 1 (Sec –II)	SEC–2	2T	2
BS306	Relational Data Base Management Systems	DSC–3C	4T+3P=7	4 + 1 =5
	SEMESTER – IV			
BS401	Leadership & Management Skill (or) (Sec –III) Universal Human Values	SEC–3	2T	2
BS402	Python – 2 (Sec –IV)	SEC–4	2T	2
BS406	Multi Media Systems	DSC–3D	4T+3P=7	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies	GE	4T	4
BS505	Programming in Java	DSE–3E	4T+3P=7	4 + 1 =5
	SEMESTER – VI			
BS605	Web Technologies	DSE–3F	4T+3P=7	4 + 1 =5
	Project/Optional			
BS601	Information Security and Cyber Laws	PO	3T+3P=6	3 + 1 =4
			Total Number of Credits	**48**

Prof.G.Kamala
Chairperson Board of Studies in Computer Science, OU

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – III
Relational Data base Management Systems

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit-I

Basic Concepts: Database Management System, File based system, Advantages of DBMS over file based system, Database Approach, Logical DBMS Architecture, Three level architecture of DBMS or logical DBMS architecture, Need for three level architecture, Physical DBMS Architecture, Database Administrator (DBA) Functions & Role, Data files indices and Data Dictionary, Types of Database.

Relational and ER Models: Data Models, Relational Model, Domains, Tuple and Relation, Super keys, Candidate keys, Primary keys and foreign key for the Relations, Relational Constraints, Domain Constraint, Key Constraint, Integrity Constraint, Update Operations and Dealing with Constraint Violations, Relational Operations, Entity Relationship (ER) Model, Entities, Attributes, Relationships, More about Entities and Relationships, Defining Relationship for College Database, E-R Diagram, Conversion of E-R Diagram to Relational Database.

Unit-II

Database Integrity And Normalisation: Relational Database Integrity, The Keys, Referential Integrity, Entity Integrity, Redundancy and Associated Problems – Single Valued Dependencies – Normalisation, Rules of Data Normalization, The First Normal Form, The Second Normal Form, The Third Normal Form, Boyce Codd Normal Form, Attribute Preservation, Lossless, join Decomposition Dependency Preservation.

File Organization: Physical Database Design Issues, Storage of Database on Hard Disks, File Organization and Its Types, Heap files (Unordered files), Sequential File Organization – Indexed (Indexed Sequential) File Organization, Hashed File Organization, Types of Indexes, Index and Tree Structure.

Unit-III

Structures Query Language (SQL): Meaning – SQL commands, Data Definition Language, Data Manipulation Language – Data Control Language, Transaction Control Language Queries using Order by, Where, Group by, Nested Queries. Joins – Views – Sequences, Indexes and Synonyms, Table Handling.

Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries.

Unit-IV

Transactions and Concurrency Management: Transactions, Concurrent Transactions, Locking Protocol, Serializable Schedules – Locks Two Phase Locking (2PL), Deadlock and its Prevention, Optimistic Concurrency Control.

Database Recovery and Security: Database Recovery meaning, Kinds of failures – Failure Controlling methods, Database errors, Backup & Recovery Techniques, Security & Integrity.

Text Book: Database Systems: R.Elmasri & S.B. Navathe, Pearson.

References:

1. Introduction to Database Management System: ISRD Group, McGraw Hill.
2. Database Management System: R.Rama krishnan & J.Gehrke, McGraw Hill.
3. Modern Database Management: J.A.Hoffer, V.Rames & H.Topi, Pearson.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – IV
Multi Media Systems

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit - I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality; Delivering Multimedia.

Text: Meaning, Fonts and Faces, Using Text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hypertext.

Images: Before You Start to Create, Making Still Images, Color.

Unit - II

Sound: The Power of Sound, Digital Audio, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Audio File Formats, Adding Sound to Your Multimedia Project.

Animation: The Power of Motion, Principles of Animation, Animation by Computer, Making Animations.

Video: Using Video, How Video Works and Is Displayed, Digital Video Containers, Obtaining Video Clips, Shooting and Editing Video.

Unit - III

Making Multimedia: The Stages of a Multimedia Project, the Intangibles, Hardware, Software, Authoring Systems

Designing and producing: designing the structure, designing the user interface, a multimedia design case history, producing.

Unit - IV

The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.

Designing for the World Wide Web: Developing for the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web, Video for the Web.

Delivering: Testing, Preparing for Delivery, Delivering on CD-ROM, DVD and World Wide Web, Wrapping.

Text Book:

1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition.

References:

1. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson.
2. Keyes, "Multimedia Handbook", TMH.
3. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI.
4. Spoken Tutorial on "GIMP" as E-resource for Learning:-http://spoken-tutorial.org
5. Spoken Tutorial on "Blender" as E-resource for Learning:-http://spoken-tutorial.org

B.COM (Computer Applications)
CBCS COURSE STRUCTURE
w.e.f. 2019-'20

Sl.No.	*Code*	*Course Title*	*HPW*	*Credits*	*Exam Hrs*	*Marks*
(1)	(2)	(3)	(5)	(6)	(7)	(8)
		SEMESTER – I				
1.	ELS1	English (First Language)	4	4		
2.	SLS1	Second Language	4	4		
3.	AECC1	**a)**Environmental Science/ **b)**Basic Computer Skills	2	2	1 ½ hrs	40U+10I
4.	DSC101	Financial Accounting–I	5	5	3 hrs	80U+20I
5.	DSC102	Business Organization and Management	5	5	3 hrs	80U+20I
6.	DSC103	Fundamentals of Information Technology	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**27**	**25**		
		SEMESTER – II				
7.	ELS2	English (First Language)	4	4		
8.	SLS2	Second Language	4	4		
9.	AECC2	**a)**Basic Computer Skills/ **b)**Environmental Science	2	2	1 ½ hrs	40U+10I
10.	DSC201	Financial Accounting–II	5	5	3 hrs	80U+20I
11.	DSC202	Business Laws	5	5	3 hrs	80U+20I
12.	DSC203	Programming with C & C++	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**27**	**25**		
		SEMESTER – III				
13.	ELS3	English (First Language)	3	3		
14.	SLS3	Second Language	3	3		
15.	SEC1UGC Specified Course	Communication Skills / Professional Skills	2	2	1 ½ hrs	40U+10I
16.	SEC2Dept. Specified Course	**a)**Principles of Insurance/ **b)**Foundation of Digital Marketing & Web Design	2	2	1 ½ hrs	40U+10I
17.	DSC301	Advanced Accounting	5	5	3 hrs	80U+20I
18.	DSC302	Business Statistics-I	5	5	3 hrs	80U+20I
19.	DSC303	Relational Database Management System	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**27**	**25**		
		SEMESTER – IV				
20.	ELS4	English (First Language)	3	3		
21.	SLS4	Second Language	3	3		
22.	SEC3 UGC Specified Course	Leadership & Management Skills / Universal Human Values	2	2	1 ½ hrs	40U+10I
23.	SEC4Dept. SpecifiedC	**a)**Practice of Life and General Insurance / **b)**Social Media Marketing Search Engine Optimization & Online Advertising	2	2	1 ½ hrs	40U+10I

Paper DSC 103: FUNDAMENTALS OF INFORMATION TECHNOLOGY

Hours Per Week: 6 (4T+2P) **Credits**: 5
Exam Hours: 1 ½ **Marks:** 50U+35P+15I

*Objective: To u*nderstand the basic concepts and terminology of informationtechnology and to identify issues related to informationsecurity.

UNIT-I: INTRODUCTION TO COMPUTERS:

Introduction,Definition,Characteristicsofcomputer,EvolutionofComputer,BlockDiagramOf a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations ofcomputer.

Role of I/O devices in a computer system.**Input Units:** Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, **Output Units:** Monitors and its types. Printers: Impact Printers and its types. Non-Impact Printers and its types, Plotters, types of plotters, Sound cards,Speakers.

UNIT -II: COMPUTER ARITHMETIC & STORAGE FUNDAMENTALS:

Binary,Binary Arithmetic, Number System: Positional & Non Positional, Binary,Octal, Decimal, Hexadecimal, Converting from one number system to another.

Primary Vs Secondary Storage, Data storage & retrieval methods.**Primary Storage:** RAM ROM, PROM, EPROM, EEPROM. **Secondary Storage:** Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives.

UNIT-III: SOFTWARE:

Software and its needs, Types of S/W. **System Software**: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. **Application S/W** and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w.

UNIT-IV: OPERATING SYSTEM:

Functions, Measuring System Performance, Assemblers, Compilers and Interpreters.

Batch Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux.

UNIT-V: DATA COMMUNICATION:

Data, Communication, Basic Networking Devices, Communication Process, Data Transmission speed, Communication Types(modes), Data Transmission Medias, Modem and its working, characteristics, Typesof Networks, LAN Topologies, Computer Protocols, Concepts relating to networking.

SUGGESTED READINGS:

Computer Fundamentals:P.K.Sinha

Paper DSC 203:PROGRAMMING WITH C & C++

Hours Per Week: 7 (3T+4P) Credits: 5
Exam Hours: 1 ½ Marks: 50U+35P+15I

Objective:To understand the fundamental concepts of programming in C and Object Oriented Programming using C++.

UNIT-I: INTRODUCTION TO C LANGUAGE, VARIABLES, DATA TYPES AND OPERATORS

Introduction: Types of Languages- History of C language – Basic Structure –Programming Rules – Flow charts-algorithms–Commonly used library functions - Executing the C Program - Pre-processors in "C"- Keywords & Identifiers – Constants – **Variables:** Rules for defining variables - Scope and Life of a Variable– **Data types** - Type Conversion - Formatted Input and Output operations. **Operators:** Introduction – Arithmetic – Relational – Logical – Assignment - Conditional - Special - Bitwise - Increment / Decrement operator.

UNIT-II: WORKING WITH CONTROL STATEMENTS, LOOPS

Conditional statements: Introduction - If statements - If-else statements – nested if-else – break statement-continue statement-go to statement-Switch statements. **Looping statements:** Introduction-While statements – Do-while statements - For Statements-nested loop statements.

UNIT-III: FUNCTIONS, ARRAYS AND STRINGS

Functions: Definition and declaration of functions- Function proto type-return statement- types of functions-formatted and unformatted functions. **Built in functions:** Mathematical functions - String functions - Character functions - Date functions.**User defined functions:** Introduction - Need for user defined functions - Elements of functions – Function call – call by value and call by reference - Recursive functions.**Arrays:** Introduction - Defining an array - Initializing an array –characteristics of an array- One dimensional array – Two dimensional array – Multi dimensional array. **Strings:** Introduction - Declaring and initializing string - Reading and Writing strings - String standard functions.

UNIT-IV: POINTERS, STRUCTURES AND UNIONS

Pointers: Features of pointers- Declaration of Pointers-arithmetic operations with pointers

Structures: Features of Structures - Declaring and initialization of Structures –Structure within Structure-Array of Structures- Enumerated data type-**Unions**-Definition and advantages of Unions comparison between Structure & Unions.

UNIT-V: OBJECT ORIENTED CONCEPTS USING C++

Object Oriented Programming: Introduction to Object Oriented Programming - Structure of C++ – Simple programof C++– Storage Classes-Similarities and Differences between C & C++ - Data Members-Member Functions - Object Oriented Concepts-Class-Object-Inheritance-Polymorphism-Encapsulation-Abstraction.

SUGGESTED READINGS:

1. Programming with C& C++ :IndrakantiSekhar, V.V.R.Raman&V.N.Battu, Himalaya Publishers.
2. Programming in ANSI C: Balagurusamy, McGraw Hill.
3. Mastering C: K.R. Venugopal, McGraw Hill.
4. C: The Complete Reference: H.Schildt, McGraw Hill.
5. Let Us C: Y.Kanetkar, BPB.
6. Objected Oriented Programming with C++: E. Balagurusamy, McGraw Hill.
7. Mastering C++: KR.Venugopal&R.Buyya, McGraw Hill.
8. Schaum□s Outlines: Programming with C++: by John R Hubbard.
9. Let Us C++: Y.Kanetkar, BPB.

Syllabus Revision Details for the Academic Year 2020-21

Dept. of Computer Science and Computer Applications						
Syllabus revision details for the academic year 2020-21						
S.NO	PROGRAMME NAME	Yr	SEM	No. OF COURSES	No. of COURSES CHANGED	JUSTIFICATION
1	BSC COMP.SCI	I	I	9	6	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
2	B.A.C.A.	I	I	7	5	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
3	BCOM	I	I	1	NIL	
4	BSC COMP.SCI	I	II	9	6	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
5	B.A.C.A.	I	II	7	5	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
6	BCOM	I	II	1	NIL	
7	BSC COMP.SCI	II	III	3	NIL	
8	BSC CA	II	III	1	1	NEW PROGRAM WAS INTRODUCED UNDER CBCS
9	B.A.C.A.	II	III	2	NIL	
10	BCOM	II	III	2	1	NEW PROGRAM WAS INTRODUCED UNDER CBCS
11	BSC COMP.SCI	II	IV	3	NIL	
12	BSC CA	II	IV	1	1	NEW PROGRAM WAS INTRODUCED UNDER CBCS
13	B.A.C.A.	II	IV	2	NIL	
14	BCOM	II	IV	2	1	NEW PROGRAM WAS INTRODUCED UNDER CBCS
15	BSC COMP.SCI	III	V	6	NIL	
16	BSC CS	III	V	1	NIL	
17	BSC CS	III	V	1	NIL	
18	B.A.C.A.	III	V	6	4	NEW PROGRAM WAS INTRODUCED UNDER CBCS
19	BCOM	III	V	2	NIL	
20	BSC COMP.SCI	III	VI	6	NIL	
21	BSC CS	III	VI	1	NIL	
22	B.A.C.A.	III	VI	6	4	NEW PROGRAM WAS INTRODUCED UNDER CBCS
23	BCOM	III	VI	2	NIL	
				81	34	
TOTAL NUMBER OF COURES = 81						
NUMBER OF COURSES WITH SYLLABUS CHANGE = 34						
PERCENTAGE OF COURSES WITH SYLLABUS CHANGE= 42%						

FACULTY

34/84

INCHARGE

DEPARTMENT OF COMPUTERS
Tara Government College (A)
Sangareddy, Sangareddy (Dist).

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
CBCS Pattern with Effect from the Academic Year 2019-2020

Structure of Curriculum

Course Title	Hours/Week		Credits
	Theory	Practical	
Semester –I			
Programming in C	4	3	4+1 = 5
Semester –II			
Programming in C++	4	3	4+1 = 5
Semester –III			
Data Structures using C++	4	3	4+1 = 5
Semester –IV			
Data Base Management Systems (DBMS)	4	3	4+1 = 5
Semester –V			
Programming in Java	4	3	4+1 = 5
Semester –VI			
Web Technologies	4	3	4+1 = 5

AECC		
	Hours/Week	Credits
Fundamentals of Computers	Theory 2	2
SEC		
Semester –III		
Communication Skills (or) Professional Skills (Sec –I)	2	2
Python –I (Sec –II)	2	2
Semester –IV		
Leadership & Management Skill (or) (Sec –III) Universal Human Values	2	2
Python –II (Sec –IV)	2	2
SEMESTER-V	**Generic Elective (GE)**	
Information Technologies	4	4
Project/Optional		
Semester –VI		
PHP with MY SQL	Theory 3 / Practical 3	3+1=4

Prof.G.Kamala
Chairperson Board of Studies in Computer Science, OU

DEPARTMENT OF COMPUTERS
Tara Government College (A)
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AUTONOMOUS
SANGAREDDY-502 001.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – I
Programming in C

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS, Operational Overview of a CPU.
Program Fundamentals: Generation and Classification of Programming Languages, Compiling, Interpreting, Loading, Linking of a Program, Developing Program, Software Development.
Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.
Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,
Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.
Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multidimensional Arrays.

Unit – III

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.
Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Array of Pointers, Pointer to Array, Dynamic Memory Allocation.

Unit – IV

User-defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Array of Structures (Union), Structures verses Unions, Enumeration Types.
Files: Introduction, Using Files in C, Working with Text Files, Working with Binary Files, Files of Records, Random Access to Files of Records, Other File Management Functions.

Textbook: Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)
References:

1. Ivor Horton, Beginning C
2. Ashok Kamthane, Programming in C
3. Herbert Schildt, The Complete Reference C
4. Paul Deitel, Harvey Deitel, C How to Program
5. Byron S. Gottfried, Theory and Problems of Programming with C
6. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language
7. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – II
Programming in C++

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Searching and Sorting Arrays.
Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.
Object Oriented Programming: Procedural and Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.

Unit – II

Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Separating Class Specification from Implementation, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friends of Classes, Member-wise Assignment, Copy Constructors, Operator Overloading, Object Conversion, Aggregation.

Unit – III

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructors and Destructors in Base and Derived Classes, Class Hierarchies, Polymorphism-Function Overloading, Function Overriding and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.
C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Extracting Data from the Exception Class, Re-throwing an Exception.
Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Templates and Inheritance, , Introduction to the STL.

Textbook: Tony Gaddis, Starting out with C++: from control structures through objects (7e)
References:

1. B. Lippman, C++ Primer
2. Bruce Eckel, Thinking in C++
3. K.R. Venugopal, Mastering C++
4. Herbert Schildt, C++: The Complete Reference
5. Bjarne Stroustrup, The C++ Programming Language
6. Sourav Sahay, Object Oriented Programming with C++TEXT BOOK:
7. Object Oriented Programming with C++ Sixth edition, E.Balaguruswamy.
8. A Structured Approach Using C++ By B.A.Forouzan & Rf Gilberg (Thomson Business Information India)
9. Herbert Schilbt, C++ - The Complete Reference, TMH 2002
10. J.P. Cohoon and J.W. Davidson, C++ program design – An Introduction To Programming and Object Oriented Design.- MGH 1999.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc (Computer Applications)
CBCS Pattern with Effect from the Academic Year 2019-2020

Code	Course Title	Course Type	HpW	Credits
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BS106	Programming in C	DSC–3A	4T+3P=7	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+3P=7	4 + 1 =5
	AECC			
BS107	Fundamentals of Computers	AECC	2T	2
	SEMESTER – III			
BS301	Communication Skills(or) Professional Skills (Sec –I)	SEC–1	2T	2
BS302	Python – 1 (Sec –II)	SEC–2	2T	2
BS306	Relational Data Base Management Systems	DSC–3C	4T+3P=7	4 + 1 =5
	SEMESTER – IV			
BS401	Leadership & Management Skill (or) (Sec –III) Universal Human Values	SEC–3	2T	2
BS402	Python – 2 (Sec –IV)	SEC–4	2T	2
BS406	Multi Media Systems	DSC–3D	4T+3P=7	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies	GE	4T	4
BS505	Programming in Java	DSE–3E	4T+3P=7	4 + 1 =5
	SEMESTER – VI			
BS605	Web Technologies	DSE–3F	4T+3P=7	4 + 1 =5
	Project/Optional			
BS601	Information Security and Cyber Laws	PO	3T+3P=6	3 + 1 =4
			Total Number of Credits	**48**

Prof.G.Kamala
Chairperson Board of Studies in Computer Science, OU

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – I
Programming in C

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS, Operational Overview of a CPU.
Program Fundamentals: Generation and Classification of Programming Languages, Compiling, Interpreting, Loading, Linking of a Program, Developing Program, Software Development.
Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.
Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,
Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.
Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h,

Unit – III

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.
Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Dynamic Memory Allocation.

Unit – IV

User-defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Structures verses Unions, Enumeration Types.
Files: Introduction, Using Files in C, Working with Text Files and Binary Files, Other File Management Functions.

Textbook: Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)
References:

1. Ivor Horton, Beginning C
2. Ashok Kamthane, Programming in C
3. Herbert Schildt, The Complete Reference C
4. Paul Deitel, Harvey Deitel, C How to Program
5. Byron S. Gottfried, Theory and Problems of Programming with C
6. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language
7. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – II
Programming in C++

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Searching and Sorting Arrays.
Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.

Unit – II

Object Oriented Programming: Procedural and Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.
Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Separating Class Specification from Implementation, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friends of Classes, Member-wise Assignment, Copy Constructors, Operator Overloading.

Unit – III

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructors and Destructors in Base and Derived Classes, Redefining Base Class Functions, Polymorphism and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.
C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Extracting Data from the Exception Class, Re-throwing an Exception.
Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Templates and Inheritance.

Textbook: Tony Gaddis, Starting out with C++: from control structures through objects (7e)
References:

1. B. Lippman, C++ Primer
2. Bruce Eckel, Thinking in C++
3. K.R. Venugopal, Mastering C++
4. Herbert Schildt, C++: The Complete Reference
5. Bjarne Stroustrup, The C++ Programming Language
6. Sourav Sahay, Object Oriented Programming with C++TEXT BOOK:

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc (Computer Applications)
CBCS Pattern with Effect from the Academic Year 2019-2020

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+3P=7	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+3P=7	4 + 1 =5
	AECC			
BS107	Fundamentals of Computers	AECC	2T	2
	SEMESTER – III			
BS301	Communication Skills(or) Professional Skills (Sec –I)	SEC–1	2T	2
BS302	Python – 1 (Sec –II)	SEC–2	2T	2
BS306	Relational Data Base Management Systems	DSC–3C	4T+3P=7	4 + 1 =5
	SEMESTER – IV			
BS401	Leadership & Management Skill (or) (Sec –III) Universal Human Values	SEC–3	2T	2
BS402	Python – 2 (Sec –IV)	SEC–4	2T	2
BS406	Multi Media Systems	DSC–3D	4T+3P=7	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies	GE	4T	4
BS505	Programming in Java	DSE–3E	4T+3P=7	4 + 1 =5
	SEMESTER – VI			
BS605	Web Technologies	DSE–3F	4T+3P=7	4 + 1 =5
	Project/Optional			
BS601	Information Security and Cyber Laws	PO	3T+3P=6	3 + 1 =4
		Total Number of Credits		**48**

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OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – III
Relational Data base Management Systems

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit-I

Basic Concepts: Database Management System, File based system, Advantages of DBMS over file based system, Database Approach, Logical DBMS Architecture, Three level architecture of DBMS or logical DBMS architecture, Need for three level architecture, Physical DBMS Architecture, Database Administrator (DBA) Functions & Role, Data files indices and Data Dictionary, Types of Database.

Relational and ER Models: Data Models, Relational Model, Domains, Tuple and Relation, Super keys, Candidate keys, Primary keys and foreign key for the Relations, Relational Constraints, Domain Constraint, Key Constraint, Integrity Constraint, Update Operations and Dealing with Constraint Violations, Relational Operations, Entity Relationship (ER) Model, Entities, Attributes, Relationships, More about Entities and Relationships, Defining Relationship for College Database, E-R Diagram, Conversion of E-R Diagram to Relational Database.

Unit-II

Database Integrity And Normalisation: Relational Database Integrity, The Keys, Referential Integrity, Entity Integrity, Redundancy and Associated Problems – Single Valued Dependencies – Normalisation, Rules of Data Normalization, The First Normal Form, The Second Normal Form, The Third Normal Form, Boyce Codd Normal Form, Attribute Preservation, Lossless, join Decomposition Dependency Preservation.

File Organization: Physical Database Design Issues, Storage of Database on Hard Disks, File Organization and Its Types, Heap files (Unordered files), Sequential File Organization – Indexed (Indexed Sequential) File Organization, Hashed File Organization, Types of Indexes, Index and Tree Structure.

Unit-III

Structures Query Language (SQL): Meaning – SQL commands, Data Definition Language, Data Manipulation Language – Data Control Language, Transaction Control Language Queries using Order by, Where, Group by, Nested Queries. Joins – Views – Sequences, Indexes and Synonyms, Table Handling.

Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries.

Unit-IV

Transactions and Concurrency Management: Transactions, Concurrent Transactions, Locking Protocol, Serializable Schedules – Locks Two Phase Locking (2PL), Deadlock and its Prevention, Optimistic Concurrency Control.

Database Recovery and Security: Database Recovery meaning, Kinds of failures – Failure Controlling methods, Database errors, Backup & Recovery Techniques, Security & Integrity.

Text Book: Database Systems: R.Elmasri & S.B. Navathe, Pearson.

References:

1. Introduction to Database Management System: ISRD Group, McGraw Hill.
2. Database Management System: R.Rama krishnan & J.Gehrke, McGraw Hill.
3. Modern Database Management: J.A.Hoffer, V.Rames & H.Topi, Pearson.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – IV
Multi Media Systems

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit - I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality; Delivering Multimedia.

Text: Meaning, Fonts and Faces, Using Text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hypertext.

Images: Before You Start to Create, Making Still Images, Color.

Unit - II

Sound: The Power of Sound, Digital Audio, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Audio File Formats, Adding Sound to Your Multimedia Project.

Animation: The Power of Motion, Principles of Animation, Animation by Computer, Making Animations.

Video: Using Video, How Video Works and Is Displayed, Digital Video Containers, Obtaining Video Clips, Shooting and Editing Video.

Unit - III

Making Multimedia: The Stages of a Multimedia Project, the Intangibles, Hardware, Software, Authoring Systems

Designing and producing: designing the structure, designing the user interface, a multimedia design case history, producing.

Unit - IV

The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.

Designing for the World Wide Web: Developing for the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web, Video for the Web.

Delivering: Testing, Preparing for Delivery, Delivering on CD-ROM, DVD and World Wide Web, Wrapping.

Text Book:

1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition.

References:

1. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson.
2. Keyes, "Multimedia Handbook", TMH.
3. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI.
4. Spoken Tutorial on "GIMP" as E-resource for Learning:-http://spoken-tutorial.org
5. Spoken Tutorial on "Blender" as E-resource for Learning:-http://spoken-tutorial.org

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc (Computer Applications)
CBCS Pattern with Effect from the Academic Year 2019-2020

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+3P=7	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+3P=7	4 + 1 =5
	AECC			
BS107	Fundamentals of Computers	AECC	2T	2
	SEMESTER – III			
BS301	Communication Skills(or) Professional Skills (Sec –I)	SEC–1	2T	2
BS302	Python – 1 (Sec –II)	SEC–2	2T	2
BS306	Relational Data Base Management Systems	DSC–3C	4T+3P=7	4 + 1 =5
	SEMESTER – IV			
BS401	Leadership & Management Skill (or) (Sec –III) Universal Human Values	SEC–3	2T	2
BS402	Python – 2 (Sec –IV)	SEC–4	2T	2
BS406	Multi Media Systems	DSC–3D	4T+3P=7	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies	GE	4T	4
BS505	Programming in Java	DSE–3E	4T+3P=7	4 + 1 =5
	SEMESTER – VI			
BS605	Web Technologies	DSE–3F	4T+3P=7	4 + 1 =5
	Project/Optional			
BS601	Information Security and Cyber Laws	PO	3T+3P=6	3 + 1 =4
			Total Number of Credits	**48**

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OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – V
Programming in Java

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit - I

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Structure of Java Program, Type Casting, Conditional Statements, Loops, Classes, Objects, Class Declaration, Creating Objects.

Unit - II

Method Declaration and Invocation, Method Overloading, Constructors – Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects. Class Variables &Method-static Keyword, this Keyword, One-Dimensional Arrays, Two-Dimensional Arrays, Command-Line Arguments, Inner Class.

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keyword, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

Packages: Creating and Using Packages, Access Protection, Wrapper Classes, String Class, StringBuffer Class.

Unit - III

Exception: Introduction, Types, Exception Handling Techniques, User-Defined Exception.

Multithreading: Introduction, Main Thread and Creation of New Threads –By Inheriting the Thread Class or Implementing the Runnable Interface, Thread Lifecycle, Thread Priority and Synchronization.

Input/Output: Introduction, java.io Package, File Streams, FileInputStream Class, FileOutputStream Class, Scanner Class, BufferedInputStream Class, BufferedOutputStream Class, RandomAccessFile Class.

Unit - IV

Applets: Introduction, Example, Life Cycle, Applet Class, Common Methods Used in Displaying the Output (Graphics Class).

Event Handling: Introduction, Types of Events, Example.

AWT: Introduction, Components, Containers, Button, Label, Checkbox, Radio Buttons, Container Class, Layouts.

Swings: Introduction, Differences between Swing and AWT, JFrame, JApplet, JPanel, Components in Swings, Layout Managers, JTable.

Text Book:

1. Sachin Malhotra, Saurabh Choudhary, Programming in Java (2e)

References:

1. Bruce Eckel, Thinking in Java (4e)
2. Herbert Schildt, Java: The Complete Reference (9e)
3. Y. Daniel Liang, Introduction to Java Programming (10e)
4. Paul Deitel, Harvey Deitel, Java: How To Program (10e)
5. Cay S. Horsttnann, Core Java Volume I –Fundamentals (10e)

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Applications)
SEMESTER – VI
Web Technologies

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction To XHTML– Introduction, first HTML, Headings, Linking, Images, special characters and horizontal rules, Lists, Tables, Frames, Forms, internal linking, meta Elements.
Cascading Style Sheets – Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking external sheets, position Elements, box model and text flow, media types, building a CSS drop-down menu, user style sheets, CSS3.

Unit – II

Introduction To Java Scripting- introduction, simple program, prompt dialog and alert boxes, memory concepts, operators(arithmetic, relational, assignment, increment and decrement, logical), decision making, control structures, if… else statement, while, counter-controlled repetitions, switch statement, do… while statement, break and continue statements.

Unit – III

Functions – program modules in JavaScript, programmer–defined functions, functions definition, scope rules, global functions, Recursion. Arrays- introduction, declaring and allocating arrays, references and reference parameters, passing arrays to functions. Multidimensional arrays, Events – registering event handling, event onload, onmouseover, onmouseout, onfocus, onblur, onsubmit, onreset, event bubbling, more events.

Unit – IV

Java Script Objects – introduction to object technology, Math Object, String Object, Date Object, Boolean and Number Object, document and window Objects, using cookies.
XML - Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

Text Book:

1. Internet & World Wide Web: HOW TO PROGRAM- H. M. Deitel, P.J. Deitel, -Fourth Edition- Pearson edition.

DEPARTMENT OF COMPUTERS
Tara Government College (A)
Sangareddy, Sangareddy (Dist).

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001.

B.COM (Computer Applications)
CBCS COURSE STRUCTURE
w.e.f. 2019-'20

Sl.No.	*Code*	*Course Title*	*HPW*	*Credits*	*Exam Hrs*	*Marks*
(1)	(2)	(3)	(5)	(6)	(7)	(8)
		SEMESTER – I				
1.	ELS1	English (First Language)	4	4		
2.	SLS1	Second Language	4	4		
3.	AECC1	**a)**Environmental Science/ **b)**Basic Computer Skills	2	2	1 ½ hrs	40U+10I
4.	DSC101	Financial Accounting–I	5	5	3 hrs	80U+20I
5.	DSC102	Business Organization and Management	5	5	3 hrs	80U+20I
6.	DSC103	Fundamentals of Information Technology	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**27**	**25**		
		SEMESTER – II				
7.	ELS2	English (First Language)	4	4		
8.	SLS2	Second Language	4	4		
9.	AECC2	**a)**Basic Computer Skills/ **b)**Environmental Science	2	2	1 ½ hrs	40U+10I
10.	DSC201	Financial Accounting–II	5	5	3 hrs	80U+20I
11.	DSC202	Business Laws	5	5	3 hrs	80U+20I
12.	DSC203	Programming with C & C++	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**27**	**25**		
		SEMESTER – III				
13.	ELS3	English (First Language)	3	3		
14.	SLS3	Second Language	3	3		
15.	SEC1UGC Specified Course	Communication Skills / Professional Skills	2	2	1 ½ hrs	40U+10I
16.	SEC2Dept. Specified Course	**a)**Principles of Insurance/ **b)**Foundation of Digital Marketing & Web Design	2	2	1 ½ hrs	40U+10I
17.	DSC301	Advanced Accounting	5	5	3 hrs	80U+20I
18.	DSC302	Business Statistics-I	5	5	3 hrs	80U+20I
19.	DSC303	Relational Database Management System	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**27**	**25**		
		SEMESTER – IV				
20.	ELS4	English (First Language)	3	3		
21.	SLS4	Second Language	3	3		
22.	SEC3 UGC Specified Course	Leadership & Management Skills / Universal Human Values	2	2	1 ½ hrs	40U+10I
23.	SEC4Dept. SpecifiedC	**a)**Practice of Life and General Insurance / **b)**Social Media Marketing Search Engine Optimization & Online Advertising	2	2	1 ½ hrs	40U+10I

	ourse					
24.	DSC401	Income Tax	5	5	3 hrs	80U+20I
25.	DSC402	Business Statistics-II	5	5	3 hrs	80U+20I
26.	DSC403	Web Technologies	3T+4P	5	1 ½ hrs	50T+35P+ 15I
		Total	**27**	**25**		
		SEMESTER – V				
27.	ELS5	English (First Language)	3	3		
28.	SLS5	Second Language	3	3		
29.	GE	a)Business Economics / b) Advanced Aspects of Income Tax	4	4	3 hrs	80U+20I
30.	DSE501	**a)** Cost Accounting/ **b)** Financial Planning & Performance/ **c)** InternationalFinancial Reporting-I	5	5	3 hrs	80U+20I
31.	DSE502	**a)** Computerized Accounting/ **b)** Financial Decision Making-I/ **c)** International Tax &Regulation	3T+4P/ 5	5	3 hrs	50T+35P + 15I/ 80U+20I
32.	DSE503	**a)** Management Information Systems/ **b)** Ecommerce/**c)** Mobile Applications	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**29/27**	**25**		
		SEMESTER - VI				
33.	ELS6	English (First Language)	3	3		
34.	SLS6	Second Language	3	3		
35.	PR	Research Methodology and Project Report	2T+4R	4	1 ½ hrs	40U+10I 35R+15VV
36.	DSE601	**a)** Cost Control and Management Accounting/ **b)** Financial control/ **c)** International Financial Reporting-II	5	5	3 hrs	80U+20I
37.	DSE602	**a)** Theory and Practice of GST/ **b)** Financial Decision Making-II / **c)** InternationalAuditing	3T+4P/ 5	5	3 hrs	50T+35P + 15I/ 80U+20I
38.	DSE603	**a)** Multimedia Systems/ **b)** Cyber Security/**c)** Data Analytics	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**31/29**	**25**		
		GRAND TOTAL	**168/164**	**150**		

ELS: English Language Skill; **SLS**: Second Language Skill; **AEC:** Ability Enhancement Compulsory Course; ***SEC:** Skill Enhancement Course; **DSC:** Discipline Specific Course; **DSE:** Discipline Specific Elective; **GE:** Generic Elective; **T:** Theory; **P:** Practical; **I:** Internal Exam **U:** University Exam: **PR:** Project Report; **VV:** Viva-Voce Examination.*

Note: If a student should opt for "a" in SEC in III semester, the student has to opt for "a" only in IV semester and so is the case with "b" and "c". In the case of DSE also the rule applies.

SUMMARY OF CREDITS

Sl. No.	Course Category	No. of Courses	Credits Per Course	Credits
1	English Language	6	4/3	20
2	Second Language	6	4/3	20
3	AECC	2	2	4
4	**SEC**	**4**	**2**	**8**
5	**GE**	**1**	**4**	**4**
6	**Project Report**	**1**	**4**	**4**
7	**DSC**	**12**	**5**	**60**
8	**DSE**	**6**	**5**	**30**
	TOTAL	**40**		**150**
	Commerce	**24**		**106**
CREDITS UNDER NON-CGPA		**NSS/NCC/Sports/Extra Curricular**	**Up to 6 (2 in each year)**	
		Summer Internship	**Up to 4 (2 in each after I & II years)**	

Paper DSC 303: RELATIONAL DATABASE MANAGEMENT SYSTEM

Hours Per Week: 7 (3T+4P) **Credits**: 5
Exam Hours: 1 ½ **Marks:** 50U+35P+15I

Objective: *to acquire basic conceptual background necessary to design and develop simple database system,Relational database mode, ER model and distributed databases, and to write good queries using a standard query language called SQL.*

UNIT-I: BASIC CONCEPTS: Database Management System - File based system - Advantages ofDBMS over file based system - Database Approach - Logical DBMS Architecture - Three level architecture of DBMS or logical DBMS architecture - Need for three level architecture - Physical DBMS Architecture - Database Administrator (DBA) Functions & Role - Data files indices and Data Dictionary - Types of Database. Relational and ER Models: Data Models - Relational Model – Domains - Tuple and Relation - Super keys - Candidate keys - Primary keys and foreign key for the Relations - Relational Constraints - Domain Constraint - Key Constraint - Integrity Constraint - Update Operations and Dealing with Constraint Violations - Relational Operations - Entity Relationship (ER) Model – Entities – Attributes – Relationships - More about Entities and Relationships - Defining Relationship for College Database - E-R Diagram - Conversion of E-R Diagram to Relational Database.

UNIT-II: DATABASE INTEGRITY AND NORMALISATION: Relational Database Integrity - TheKeys - Referential Integrity - Entity Integrity - Redundancy and Associated Problems – Single Valued Dependencies – Normalisation - Rules of Data Normalisation - The First Normal Form -The Second Normal Form - The Third Normal Form - Boyce Codd Normal Form - Attribute Preservation - Lossless-join Decomposition - Dependency Preservation. File Organisation : Physical Database Design Issues - Storage of Database on Hard Disks - File Organisation and Its Types - Heap files (Unordered files) - Sequential File Organisation - Indexed (Indexed Sequential) File Organisation - Hashed File Organisation - Types of Indexes - Index and Tree Structure - Multi-key File Organisation - Need for Multiple Access Paths - Multi-list File Organisation - Inverted File Organisation.

UNIT-III: STRUCTURES QUERY LANGUAGE (SQL): Meaning–SQL commands - DataDefinition Language - Data Manipulation Language - Data Control Language - Transaction Control Language - Queries using Order by – Where - Group by - Nested Queries. Joins – Views – Sequences - Indexes and Synonyms - Table Handling.

UNIT-IV: TRANSACTIONS AND CONCURRENCY MANAGEMENT: Transactions - ConcurrentTransactions - Locking Protocol - Serialisable Schedules - Locks Two Phase Locking (2PL) - Deadlock and its Prevention - Optimistic Concurrency Control. Database Recovery and Security: Database Recovery meaning - Kinds of failures - Failure controlling methods - Database errors - Backup & Recovery Techniques - Security & Integrity - Database Security - Authorization.

UNIT-V: DISTRIBUTED AND CLIENT SERVER DATABASES: Need for Distributed DatabaseSystems - Structure of Distributed Database - Advantages and Disadvantages of DDBMS - Advantages of Data Distribution - Disadvantages of Data Distribution - Data Replication - Data Fragmentation. Client Server Databases: Emergence of Client Server Architecture - Need for Client Server Computing - Structure of Client Server Systems & its advantages.

ADVANCED TOPICS: Overview: Parallel Database - Multimedia Database - Mobile Database - Web Database - Multidimensional Database. Data Warehouse - OLTP Vs OLAP - NoSQL Database.

LAB: SQL QUERIES BASED ON VARIOUS COMMANDS.

SUGGESTED READINGS: 1)Database Systems: R.Elmasri& S.B. Navathe, Pearson.; 2) Introduction to Database Management System: ISRD Group, McGraw Hill.; 3) Database Management System: R.Ramakrishnan&J.Gehrke, McGraw Hill.; 4) Modern Database Management: J.A.Hoffer,V.Rames&H.Topi, Pearson.; 5) Database System Concepts: Silberschatz, Korth&Sudarshan, McGrawHill.6) Simplified Approach to DBMS: ParteekBhaiaKalyani Publishers.7)DatabaseManagement System: NirupmaPathak, Himalaya. 8) Database Management Systems: Pannerselvam, PHI.9) Relational DatabaseManagement System: Srivastava&Srivastava, New Age 10) PHPMySQL Spoken Tutorials by IIT Bombay. 11) OracleDatabase: A Beginner's Guide: I.Abramson, McGraw Hill.

Paper DSC 403: WEB TECHNOLOGIES

Hours Per Week:7(3T+4P **Credits**: 5
Exam Hours:1½ **Marks:** 50U+35P+15I

Objective:*To gain skills of usage of Web Technologies to design Web pages.*

UNIT-I: INTRODUCTION:

Introduction to web technology – HTML – types of HTML tags-basic Structure of HTML – Web designprinciples – HTML attributes – styles – Hypertext - Formatting text – Forms & formulating instructions & formulation elements – Commenting code – Back grounds – Images-Hyperlinks – Lists –Tables – Frames

UNIT-II: AN OVER VIEW OF DYNAMIC WEB PAGES & DYNAMIC WEB PAGE:

An over view of dynamic web pages – technologies: Introduction to Dynamic HTML programing - Cascading style sheets (CSS) – types and advantages of CSS – CSS basic syntax and structure - Changing Text and Attributes - Dynamically changing style - Text Graphics and placements - Creating multimedia effects with filters and Transactions.

UNIT-III: JAVA SCRIPT&:

Java Script: Introduction - Client side Java script - Server side Java script - Core features - Data types and variables – Operators - Expressions and statements – Functions – Objects – Array - Date and math related objects - Document object model - Eventhandling.

UNIT-IV: EVENTS AND EVENT HANDLERS:

Events And Event Handlers: General information about Events – Event – OnAbort – OnClick - Ondbl click - Ondrag drop – Onerror - Onfocus - Onkey Press – Onkey Up – Onload - Onmouse Down – Onmouse Move - Onmouse Out – Onmouse Over - Onmove - Onrest – Onresize - Onselect - Onsubmit - Onunload.

UNIT-V: EXTENSIBLE MARKUP LANGUAGE (XML:

Extensible Markup Language (XML): Introduction - Creating XML Documents - XML style Sheet – Hyperlinks in XML Document Object Model - XML Query Language.

LAB WORK: CREATING A WEBSITE WITH DYNAMIC FUNCTIONALITY USING CLIENT- SIDE AND SERVER SIDE SCRIPTING.

SUGGESTED READINGS:

1. Web Technology: IndrakantiSekhar, V.N. Battu, Himalaya Publishers.
2. Internet & World Wide Web How to Program: Deitel&Deitel,Pearson.
3. Web programming: ChrisBates.
4. HTML & XML An Introduction NIIT,PHI.
5. HTML for the WWW with XHTML & CSS: Wlizabeth Castro,Pearson
6. Internet and Web Technologies: Raj Kamal, McGrawHill.
7. Web Technology: A Developer's Perspective: Gopalan&Sivaselvan,PHI.
8. Internet Technology and Web Page Design: R.Singh&M.Sonia,Kalyani.
9. Web Technology and Design by Xavier, New Age InternationalPub.

Syllabus Revision Details for the Academic Year 2021-22

Dept. of Computer Science and Computer Applications						
Syllabus revision details for the academic year 2021-22						
S.NO	PROGRAMME NAME	Yr	SEM	No. OF COURSES	No. of COURSES CHANGED	JUSTIFICATION
1	BSC CS	I	I	10	2	NEW PROGRAM WERE INTRODUCED UNDER CBCS
2	B.A.C.A.	I	I	3	NIL	
3	BCOM CA	I	I	1	NIL	
4	BSC CS	I	II	10	2	NEW PROGRAM WERE INTRODUCED UNDER CBCS
5	B.A.C.A.	I	II	3	NIL	
6	BCOM CA	I	II	1	NIL	
7	AECC	I	II	41	41	BASIC COMPUTER SKILLS INTRODUCED AS AECC
8	BSC COMP.SCI	II	III	9	6	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
9	B.A.C.A.	II	III	7	5	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
10	BCOM	II	III	1	NIL	
11	BSC COMP.SCI	II	IV	9	6	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
12	B.A.C.A.	II	IV	7	5	NEW PROGRAMS WERE INTRODUCED UNDER CBCS
13	BCOM	II	IV	1	NIL	
14	BSC COMP.SCI	III	V	3	3	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. PROGRAMMING IN JAVA
15	BSC CA	III	V	1	1	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. PROGRAMMING IN JAVA
16	B.A.C.A.	III	V	2	2	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. PROGRAMMING IN JAVA
17	BCOM	III	V	2	2	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. E-COMMERCE
18	BSC COMP.SCI	III	VI	3	3	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. WEB TECHNOLOGIES
19	BSC CA	III	VI	1	1	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. WEB TECHNOLOGIES
20	B.A.C.A.	III	VI	2	2	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. WEB TECHNOLOGIES
21	BCOM	III	VI	2	2	PAPER PATTERN CHANGED SINGLE PAPER IS OFFERED I.E. IS CYBER SECURITY
				119	83	
TOTAL NUMBER OF COURES = 119						
NUMBER OF COURSES WITH SYLLABUS CHANGE = 83						
PERCENTAGE OF COURSES WITH SYLLABUS CHANGE= 69.74%						

S. Nag
FACULTY

INCHARGE

DEPARTMENT OF COMPUTERS
Tara Government College (A)
Sangareddy, Sangareddy (Dist).

PRINCIPAL
TARA GOVT. COLLEGE
AUTONOMOUS
SANGAREDDY-502 001

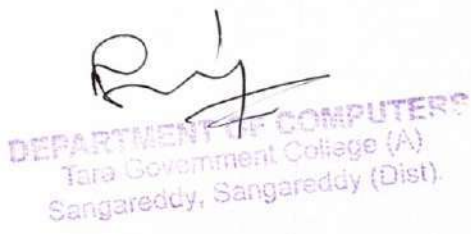
OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
CBCS Pattern with Effect from the Academic Year 2019-2020

Structure of Curriculum

Course Title	Hours/Week		Credits
	Theory	Practical	
Semester –I			
Programming in C	4	3	4+1 = 5
Semester –II			
Programming in C++	4	3	4+1 = 5
Semester –III			
Data Structures using C++	4	3	4+1 = 5
Semester –IV			
Data Base Management Systems (DBMS)	4	3	4+1 = 5
Semester –V			
Programming in Java	4	3	4+1 = 5
Semester –VI			
Web Technologies	4	3	4+1 = 5

AECC		
	Hours/Week	Credits
	Theory	
Fundamentals of Computers	2	2
SEC		
Semester –III		
Communication Skills (or) Professional Skills (Sec –I)	2	2
Python –I (Sec –II)	2	2
Semester –IV		
Leadership & Management Skill (or) (Sec –III) Universal Human Values	2	2
Python –II (Sec –IV)	2	2
SEMESTER-V	**Generic Elective (GE)**	
Information Technologies	4	4
Project/Optional		
Semester –VI		
PHP with MY SQL	Theory 3 / Practical 3	3+1=4

Prof.G.Kamala
Chairperson Board of Studies in Computer Science, OU



OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
CBCS Pattern with Effect from the Academic Year 2019-2020

Structure of Curriculum

Course Title	Hours/Week		Credits
	Theory	Practical	
Semester –I			
Programming in C	4	3	4+1 = 5
Semester –II			
Programming in C++	4	3	4+1 = 5
Semester –III			
Data Structures using C++	4	3	4+1 = 5
Semester –IV			
Data Base Management Systems (DBMS)	4	3	4+1 = 5
Semester –V			
Programming in Java	4	3	4+1 = 5
Semester –VI			
Web Technologies	4	3	4+1 = 5

AECC		
	Hours/Week	Credits
Fundamentals of Computers	Theory 2	2
SEC		
Semester –III		
Communication Skills (or) Professional Skills (Sec –I)	2	2
Python –I (Sec –II)	2	2
Semester –IV		
Leadership & Management Skill (or) (Sec –III) Universal Human Values	2	2
Python –II (Sec –IV)	2	2
SEMESTER-V	**Generic Elective (GE)**	
Information Technologies	4	4
Project/Optional		
Semester –VI		
PHP with MY SQL	Theory 3 / Practical 3	3+1=4

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OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
CBCS Pattern with Effect from the Academic Year 2019-2020

Structure of Curriculum

Course Title	Hours/Week		Credits
	Theory	Practical	
Semester –I			
Programming in C	4	3	4+1 = 5
Semester –II			
Programming in C++	4	3	4+1 = 5
Semester –III			
Data Structures using C++	4	3	4+1 = 5
Semester –IV			
Data Base Management Systems (DBMS)	4	3	4+1 = 5
Semester –V			
Programming in Java	4	3	4+1 = 5
Semester –VI			
Web Technologies	4	3	4+1 = 5

AECC		
	Hours/Week	Credits
Fundamentals of Computers	Theory 2	2
SEC		
Semester –III		
Communication Skills (or) Professional Skills (Sec –I)	2	2
Python –I (Sec –II)	2	2
Semester –IV		
Leadership & Management Skill (or) (Sec –III) Universal Human Values	2	2
Python –II (Sec –IV)	2	2
SEMESTER-V	**Generic Elective (GE)**	
Information Technologies	4	4
Project/Optional		
Semester –VI		
PHP with MY SQL	Theory 3 / Practical 3	3+1=4

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OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – I
Programming in C

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS, Operational Overview of a CPU.
Program Fundamentals: Generation and Classification of Programming Languages, Compiling, Interpreting, Loading, Linking of a Program, Developing Program, Software Development.
Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.
Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,
Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.
Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multidimensional Arrays.

Unit – III

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.
Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Array of Pointers, Pointer to Array, Dynamic Memory Allocation.

Unit – IV

User-defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Array of Structures (Union), Structures verses Unions, Enumeration Types.
Files: Introduction, Using Files in C, Working with Text Files, Working with Binary Files, Files of Records, Random Access to Files of Records, Other File Management Functions.

Textbook: Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)
References:

1. Ivor Horton, Beginning C
2. Ashok Kamthane, Programming in C
3. Herbert Schildt, The Complete Reference C
4. Paul Deitel, Harvey Deitel, C How to Program
5. Byron S. Gottfried, Theory and Problems of Programming with C
6. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language
7. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – II
Programming in C++

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Searching and Sorting Arrays.
Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.
Object Oriented Programming: Procedural and Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.

Unit – II

Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Separating Class Specification from Implementation, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friends of Classes, Member-wise Assignment, Copy Constructors, Operator Overloading, Object Conversion, Aggregation.

Unit – III

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructors and Destructors in Base and Derived Classes, Class Hierarchies, Polymorphism-Function Overloading, Function Overriding and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.
C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Extracting Data from the Exception Class, Re-throwing an Exception.
Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Templates and Inheritance, , Introduction to the STL.

Textbook: Tony Gaddis, Starting out with C++: from control structures through objects (7e)
References:

1. B. Lippman, C++ Primer
2. Bruce Eckel, Thinking in C++
3. K.R. Venugopal, Mastering C++
4. Herbert Schildt, C++: The Complete Reference
5. Bjarne Stroustrup, The C++ Programming Language
6. Sourav Sahay, Object Oriented Programming with C++TEXT BOOK:
7. Object Oriented Programming with C++ Sixth edition, E.Balaguruswamy.
8. A Structured Approach Using C++ By B.A.Forouzan & Rf Gilberg (Thomson Business Information India)
9. Herbert Schilbt, C++ - The Complete Reference, TMH 2002
10. J.P. Cohoon and J.W. Davidson, C++ program design – An Introduction To Programming and Object Oriented Design.- MGH 1999.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – III
Data Structures using C++

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit - I

Basic data Structure: Introduction to Data Structures, Types of Data Structures, and Introduction to Algorithms, Pseudo code, and Relationship among data, data structures, and algorithms, Implementation of data structures, Analysis of Algorithms.

Stacks: Concept of Stacks and Queues, Stacks, Stack Abstract Data Type, Representation of Stacks Using Sequential Organization (Arrays), Multiple Stacks, Applications of Stack, Expression Evaluation and Conversion, Polish notation and expression conversion, Processing of Function Calls, Reversing a String with a Stack, Recursion.

Unit - II

Recursion: Introduction, Recurrence, Use of Stack in Recursion, Variants of Recursion, Recursive Functions, Iteration versus Recursion.

Queues: Concept of Queues, Queue as Abstract Data Type, Realization of Queues Using Arrays, Circular Queue, Multi-queues, Dequeue, Priority Queue, Applications of Queues,

Linked Lists: Introduction, Linked List, Linked List Abstract Data Type, Linked List Variants, Doubly Linked List, Circular Linked List, Representation of Sparse Matrix Using Linked List, Linked Stack, Linked Queue.

Unit - III

Trees: Introduction, Types of Trees, Binary Tree, Binary Tree Abstract Data Type, Realization of a Binary Tree, Insertion of a Node in Binary Tree, Binary Tree Traversal, Other Tree Operations, Binary Search Tree, Threaded Binary Tree, Applications of Binary Trees.

Searching and Sorting: Search Techniques-Linear Search, Binary Search, Sorting Techniques- Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Comparison of All Sorting Methods, Search Trees: Symbol Table, Optimal Binary Search Tree, AVL Tree (Height-balanced Tree).

Unit - IV

Graphs: Introduction, Representation of Graphs, Graph Traversal – Depth First Search, Breadth First Search, Spanning Tree, Prim's Algorithm, Kruskal's Algorithm.

Hashing: Introduction, Key Terms and Issues, Hash Functions, Collision Resolution Strategies, Hash Table Overflow, Extendible Hashing

Heaps: Basic Concepts, Implementation of Heap, Heap as Abstract Data Type, Heap Sort, Heap Applications.

Text books:

1. Varsha H. Patil "Data structures using C++" Oxford University press, 2012
2. M.T. Goodrich, R. Tamassia and D. Mount, Data Structures and Algorithms in C++, John Wiley and Sons, Inc., 2011.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – IV
Data Base Management Systems

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit - I

Introduction: Database-System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Database Users and Administrators.
Introduction to the Relational Model: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.

Unit - II

Database Design and the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features, Alternative Notations for Modeling Data, Other Aspects of Database Design.
Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional- Dependency Theory, Decomposition Using Multivalued Dependencies, Normal Forms-2 NF, 3 NF, BCNF, The Database Design Methodology for Relational Databases.

Unit - III

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Subqueries , Modification of the Database.
Intermediate SQL: Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas, Authorization.
Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries.

Unit - IV

Transaction Management: Transaction Support–Properties of Transactions, Database Architecture, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery–The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques, Nested Transaction Model. Security: Database Security–Threats, Computer-Based Controls–Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

Text book:

1. Silberschatz, H. Korth and S. Sudarshan, Database System Concepts, 6th Ed., Tata McGraw Hill, 2011
2. Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – V
Programming in Java

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit - I

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Structure of Java Program, Type Casting, Conditional Statements, Loops, Classes, Objects, Class Declaration, Creating Objects.

Unit - II

Method Declaration and Invocation, Method Overloading, Constructors – Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects. Class Variables &Method-static Keyword, this Keyword, One-Dimensional Arrays, Two-Dimensional Arrays, Command-Line Arguments, Inner Class.

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keyword, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

Packages: Creating and Using Packages, Access Protection, Wrapper Classes, String Class, StringBuffer Class.

Unit - III

Exception: Introduction, Types, Exception Handling Techniques, User-Defined Exception.

Multithreading: Introduction, Main Thread and Creation of New Threads –By Inheriting the Thread Class or Implementing the Runnable Interface, Thread Lifecycle, Thread Priority and Synchronization.

Input/Output: Introduction, java.io Package, File Streams, FileInputStream Class, FileOutputStream Class, Scanner Class, BufferedInputStream Class, BufferedOutputStream Class, RandomAccessFile Class.

Unit - IV

Applets: Introduction, Example, Life Cycle, Applet Class, Common Methods Used in Displaying the Output (Graphics Class).

Event Handling: Introduction, Types of Events, Example.

AWT: Introduction, Components, Containers, Button, Label, Checkbox, Radio Buttons, Container Class, Layouts.

Swings: Introduction, Differences between Swing and AWT, JFrame, JApplet, JPanel, Components in Swings, Layout Managers, JTable.

Text Book:

1. Sachin Malhotra, Saurabh Choudhary, Programming in Java (2e)

References:

1. Bruce Eckel, Thinking in Java (4e)
2. Herbert Schildt, Java: The Complete Reference (9e)
3. Y. Daniel Liang, Introduction to Java Programming (10e)
4. Paul Deitel, Harvey Deitel, Java: How To Program (10e)
5. Cay S. Horsttnann, Core Java Volume I –Fundamentals (10e)

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – VI
Web Technologies

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction To XHTML– Introduction, first HTML, Headings, Linking, Images, special characters and horizontal rules, Lists, Tables, Frames, Forms, internal linking, meta Elements. CASCADING STYLE SHEETS – Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking external sheets, position Elements, box model and text flow, media types, building a CSS drop-down menu, user style sheets, CSS3.

Unit – II

Introduction To Java Scripting- introduction, simple program, prompt dialog and alert boxes, memory concepts, operators, decision making, control structures, if… else statement, while, counter-controlled repetitions, switch statement, do… while statement, *break* and *continue* statements. Functions – program modules in JavaScript, programmer–defined functions, functions definition, scope rules, global functions, Recursion.

Unit – III

Arrays- introduction, declaring and allocating arrays, references and reference parameters, passing arrays to functions. Multidimensional arrays, **EVENTS** – registering event handling, event onload, onmouseover, onmouseout, onfocus, onblur, onsubmit, onreset, event bubbling, more events. **JAVA SCRIPT OBJECTS** – introduction to object technology, Math Object, String Object, Date Object, Boolean and Number Object, document and window Objects, using cookies.

Unit – IV

XML - Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

Ajax-Enabled Rich Internet Applications: introduction, history of Ajax, traditional web applications Vs Ajax Applications, RIAs with Ajax, Ajax example using XMLHttpRequest object, XML and DOM, creating full scale Ajax-enabled application, Dojo Toolkit.

Text Book:

1. Internet & World Wide Web: HOW TO PROGRAM- H. M. Deitel, P.J. Deitel, - Fourth Edition- Pearson edition.

OSMANIA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. Computer Science
Semester-I
AECC

Fundamentals of Computers

Theory **2 Hours/Week** **2Credits**

Unit-I

Introduction to Computers: what is a computer, characteristics of Computers, Generations of Computers, Classifications of Computers, Basic Computer organization, Applications of Computers. Input and Output Devices: Input devices, Output devices, Softcopy devices, Hard copy devices. Computer Memory and Processors: Introduction, Memory Hierarchy, Processor, Registers, Cache memory, primary memory, secondary storage devices, magnetic tapes, floppy disks, hard disks, optical drives, USB flash drivers, Memory cards, Mass storage devices, Basic processors architecture.

Unit-II

Number System and Computer Codes: Binary number system, working with binary numbers, octal number system, hexadecimal number system, working with fractions, signed number representation in binary form, BCD code, other codes. Boolean algebra and logic gates: Boolean algebra, Venn diagrams, representation of Boolean functions, logic gates, logic diagrams and Boolean expressions using karnaugh map. Computer Software: Introduction to computer software, classification of computer software, system software, application software, firmware, middleware, acquiring computer software, design and implementation of correct, efficient and maintainable programs.

Text Book:

Reema Thareja, Fundamentals of Computers.

References:

1. V.Rajaraman, 6th Edition Fundamentals of Computers, Neeharika Adabala.
2. Anita Goel, Computer Fundamentals.

	ourse					
24.	DSC401	Income Tax	5	5	3 hrs	80U+20I
25.	DSC402	Business Statistics-II	5	5	3 hrs	80U+20I
26.	DSC403	Web Technologies	3T+4P	5	1 ½ hrs	50T+35P+ 15I
		Total	**27**	**25**		
		SEMESTER – V				
27.	ELS5	English (First Language)	3	3		
28.	SLS5	Second Language	3	3		
29.	GE	a)Business Economics / b) Advanced Aspects of Income Tax	4	4	3 hrs	80U+20I
30.	DSE501	**a)** Cost Accounting/ **b)** Financial Planning & Performance/ **c)** InternationalFinancial Reporting-I	5	5	3 hrs	80U+20I
31.	DSE502	**a)** Computerized Accounting/ **b)** Financial Decision Making-I/ **c)** International Tax &Regulation	3T+4P/ 5	5	3 hrs	50T+35P + 15I/ 80U+20I
32.	DSE503	**a)** Management Information Systems/ **b)** Ecommerce/**c)** Mobile Applications	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**29/27**	**25**		
		SEMESTER - VI				
33.	ELS6	English (First Language)	3	3		
34.	SLS6	Second Language	3	3		
35.	PR	Research Methodology and Project Report	2T+4R	4	1 ½ hrs	40U+10I 35R+15VV
36.	DSE601	**a)** Cost Control and Management Accounting/ **b)** Financial control/ **c)** International Financial Reporting-II	5	5	3 hrs	80U+20I
37.	DSE602	**a)** Theory and Practice of GST/ **b)** Financial Decision Making-II / **c)** InternationalAuditing	3T+4P/ 5	5	3 hrs	50T+35P + 15I/ 80U+20I
38.	DSE603	**a)** Multimedia Systems/ **b)** Cyber Security/**c)** Data Analytics	3T+4P	5	1 ½ hrs	50T+35P + 15I
		Total	**31/29**	**25**		
		GRAND TOTAL	**168/164**	**150**		

ELS: English Language Skill; **SLS**: Second Language Skill; **AEC:** Ability Enhancement Compulsory Course; ***SEC: Skill Enhancement Course; DSC: Discipline Specific Course; DSE: Discipline Specific Elective; GE: Generic Elective; T: Theory; P: Practical; I: Internal Exam U: University Exam: PR: Project Report; VV: Viva-Voce Examination.***

Note: If a student should opt for "a" in SEC in III semester, the student has to opt for "a" only in IV semester and so is the case with "b" and "c". In the case of DSE also the rule applies.

SUMMARY OF CREDITS

Sl. No.	Course Category	No. of Courses	Credits Per Course	Credits
1	English Language	6	4/3	20
2	Second Language	6	4/3	20
3	AECC	2	2	4
4	**SEC**	**4**	**2**	**8**
5	**GE**	**1**	**4**	**4**
6	**Project Report**	**1**	**4**	**4**
7	**DSC**	**12**	**5**	**60**
8	**DSE**	**6**	**5**	**30**
	TOTAL	**40**		**150**
	Commerce	**24**		**106**
CREDITS UNDER NON-CGPA		**NSS/NCC/Sports/Extra Curricular**	**Up to 6 (2 in each year)**	
		Summer Internship	**Up to 4 (2 in each after I & II years)**	

Paper DSE 503 (b) :E-COMMERCE

Hours Per Week: 7 (3T+4P) **Credits:** 5
Exam Hours: 1 ½ **Marks:** 50U+35P+15I

Objective: *to acquire conceptual and application knowledge of ecommerce.*

UNIT-I: INTRODUCTION:
E-Commerce: Meaning - Advantages & Limitations - E-Business: Traditional & Contemporary Model, Impact of E-Commerce on Business Models - Classification of E-Commerce: B2B - B2C - C2B - C2C - B2E - Applications of Ecommerce: E-Commerce Organization Applications - E-Marketing - E-Advertising - E-Banking - Mobile Commerce - E-Trading - E-Learning - E-Shopping.

UNIT-II:FRAMEWORK OF E-COMMERCE:
Framework of E-Commerce: Application Services - Interface Layers - Secure Messaging - Middleware Services and Network Infrastructure - Site Security - Firewalls & Network Security - TCP/IP – HTTP - Secured HTTP – SMTP - SSL.
Data Encryption: Cryptography – Encryption – Decryption - Public Key - Private Key - Digital Signatures - Digital Certificates.

UNIT-III:CONSUMER ORIENTED E-COMMERCE APPLICATIONS:
Introduction - Mercantile Process Model: Consumers Perspective and Merchant's Perspective - Electronic Payment Systems: Legal Issues & Digital Currency - E-Cash & E-Cheque - Electronic Fund Transfer (EFT) - Advantages and Risks - Digital Token-Based E-Payment System - Smart Cards.

UNIT-IV:ELECTRONIC DATA INTERCHANGE:
Introduction - EDI Standards - Types of EDI - EDI Applications in Business – Legal - Security and Privacy issues if EDI - EDI and E-Commerce - EDI Software Implementation.

UNIT-V: E-MARKETING TECHNIQUES:
Introduction - New Age of Information - Based Marketing - Influence on Marketing - Search Engines & Directory Services - Charting the On-Line Marketing Process - Chain Letters - Applications of 5P's (Product, Price, Place, Promotion, People) E-Advertisement - Virtual Reality & Consumer Experience - Role of Digital Marketing.
Lab work: *Using Microsoft Front Page Editor and HTML in Designing a Static Webpage/Website.*

SUGGESTED READINGS:

1. Frontiers of Electronic Commerce: Ravi Kalakota, Andrew B Whinston, Pearson
2. E-Commerce: Tulasi Ram Kandula, HPH.
3. E-Commerce: An Indian Perspective: P.T. Joseph, S.J, PHI
4. Electronic Commerce, Framework Technologies & Applications: Bharat Bhasker, McGraw Hill
5. Introduction To E-Commerce: Jeffrey F Rayport, Bernard J. Jaworski: Tata McGraw Hill
6. Electronic Commerce, A Managers' Guide: Ravi Kalakota, Andrew B Whinston
7. E-Commerce & Computerized Accounting: Rajinder Singh, Er. KaisarRasheed, Kalyani
8. E-Commerce & Mobile Commerce Technologies: Pandey, SaurabhShukla, S. Chand
9. E-Business 2.0, Roadmap For Success: Ravi Kalakota, Marcia Robinson, Pearson
10. Electronic Commerce: Pete Loshin / John Vacca, Firewall Media
11. E-Commerce, Strategy, Technologies And Applications : David Whiteley, Tata Mcgraw Hill

Paper DSE 603(b) :CYBER SECURITY

Hours Per Week: 7 (3T+4P) **Credits**: 5
Exam Hours: 1 ½ **Marks:** 50U+35P+15I

Objective:*to understand the cyber security, detection, network security, the law and cyber forensic.*

UNIT-I: INTRODUCTION TO CYBER SECURITY, CYBER SECURITY VULNERABILITIES AND CYBER SECURITY SAFEGUARDS:

Introduction to Cyber Security: Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism-Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.

Cyber Security Vulnerabilities: Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness.

Cyber Security Safeguards: Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.

UNIT-II: SECURING WEB APPLICATION, SERVICES AND SERVERS:

Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges.

UNIT-III: INTRUSION DETECTION AND PREVENTION:

Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation.

UNIT-IV: CRYPTOGRAPHY AND NETWORK SECURITY:

Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, User Management, VPN Security Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec.

UNIT-V: CYBERSPACE AND THE LAW, CYBER FORENSICS:

Cyberspace and The Law: Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.

Cyber Forensics: Introduction to Cyber Forensics, Handling Preliminary Investigations, Controlling an Investigation, Conducting disk-based analysis, Investigating Information-hiding, Scrutinizing E-mail, Validating E-mail header information, Tracing Internet access, Tracing memory in real-time.

SUGGESTED READINGS:

1. Ramandeepkaurnagra, Cyber laws and Intellectual Property Rights, Kalyani Publishers, 7e,
2. Nina Godbole&SunitBelapureCyber Security, Wiley India Pvt Ltd, 2012.
3. Gerald. R. Ferrera, Reder and linchtenstein, Cyber laws – Text and Cases,3e, Cengage learning
4. FaiyazAhamed, Cyber Law and Information Security, DreamTech Press, 2013
5. PankajAgarwal, Information Security and Cyber Laws, Acme Learning, 2013
6. Manjotkaur, Essentials of E-Business and Cyber laws, Kalyani Publishers.

DEPARTMENT OF DATA SCIENCE

Tara Govt. College, Sangareddy (A)

Syllabus Revision Details

2020-21

S.No.	Academic Year	Total Number of Programes Offered	Programes with Syllabus Change	% of Syllabus change
1	2020-21	2	2	100%

DEPARTMENT OF DATA SCIENCE
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Sangareddy, Sangareddy (Dist).
20/8/21

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DEPT OF DATA SCIENCES

TARA GOVT COLLEGE, SANGAREDDY (A)

Syllabus Revision Details for the Academic Year 2020 – 21

S.No.	Course Name	Semester	No of Programmes	No of Programmes with Syllabus Change	Remarks
1	BSc Data Science - I	I	1	1	New Programme was introduced under CBCS
2	BSc Data Science - II	II	1	1	New Programme was introduced under CBCS
	Total		2	2	

Total No of Courses Offered = 2

No of Courses with Syllabus Revision = 2

% of Courses with Syllabus Revision = 2/2 = 100%

Subject Incharge

Dept Incharge

DEPARTMENT OF COMPUTERS
Tara Government College (A)
Sangareddy, Sangareddy (Dist).

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TARA Government College (A), Sangareddy, Sangareddy District

(Affiliated to Osmania University)

Re-Accredited with 'B' grade by NAAC

Department of Computer Science& Applications

Board of Studies meeting for the year 2020-21

The board of studies meeting for the Department of Computer Science and Applications isheld at Tara GDC Sangareddy, on 07-01-2020 to discuss and finalize the syllabus and evaluation pattern for I to VI semesters of B.Sc., BCom (C.A.) and B.A. (C.A.) in subject of computer science and computer applications for the term of 2020-21.

The following members are present in the meeting:

S.No.	Name of the Faculty	Designation
1.	**Smt.N. Shravani** Chairman, BOS, Department of Chemistry Tara Government College (A), Sangareddy	**Chairperson**
2.	**Prof.P.V.Sudha** Head & Professor Department of Computer Science and Engineering University College of Engineering Osmania University, Hyderabad	**University Nominee**
3.	**Dr.S.Nagaprasad** Faculty of Computer Science and Applications Tara Government College (A), Sangareddy	**Member**
4.	**Sri. M.Krishna** Faculty of Computer Science and Applications Tara Government College (A), Sangareddy	**Member**
5.	**Prof.B.Vishnu Vardhan** Vice-Principal & Professor Computer Science & Engineering JNTUH College of Engineering Manthani	**External Member**
6.	**Dr. D. Lakshmi Padmaja** Assoc. Professor, I.MISTE, Academics Incharge, Dept. of Information Technology, Anurag Group of Institutions (CVSR) Ghatkesar(M), Medchal District, Hyderabad	**External Member**
7.	**Sri.M.Rambabu** Alumni Member,Faculty of Chemistry Tara Government College (A), Sangareddy	**Member**

The following resolutions are taken in the meeting:

1. It is resolved to the follow the syllabus prescribed by Osmania University and to adopt the same forB.Sc (CS & CA),BCOM (C.A.) and B.A (CA) IIo VI Semester without making any changes for the Academic year 2020-21.

2. The pattern of syllabus is kept unchanged for I to IV semesters for theory as well as practical. Each theory paper consists of four units for B.SC and B.A. For BCOM (C.A.) Five Units.

3. The Pattern of syllabus is minutely changed for V & VI semesters. The syllabus is divided into IV units which was III earlier. The practical pattern is kept unchanged.

4. It is resolved to allot 30 marks for internal examination, 70 marks for end semester examination and 25 marks for Practical examination in each paper.The internal examination marks shall be average of two internals for each semester. The distribution of internal exam shall be as follows:

a. Seminar presentation - 5 marks

b. Assignment - 5 marks

c. Internal Exam - 20 marks

5. There will be no internal assessments for practical examinations.

6. It is discussed and decided to have 10 marks for internal and 40 marks for end semester exam in case of SEC (III to VI Semesters) and GE (V and VI Semesters) papers.

7. The model question paper prescribed for internal and end semester exams, the reference books and panel of examiners is approved.

8. Other points that are not mentioned in this BOS but were approved in erstwhile BOS meetings shall remain same without change

Board of StudiesChairman

Chairman,
Board of Studies
Dept. of Compter Science
Govt. College Sangareddy-502 001

University Nominee

Members:

Dr. K. TULASI VARDHAN

DEPARTMENT OF COMPUTERS
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B.Sc. I Year I Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - I)

Paper – I : Fundamentals of Information Technology

[4 HPW :: 4 Credits :: 100 Marks (External:80, Internal:20)]

Objectives:

1. **To deal with the basic concepts of computers.**
2. **To discuss about the computer hardware, its components and basic computer architecture.**
3. **To understand the basic computer software including the operating system and its concepts.**
4. **To introduce the software development process**
5. **To introduce the basic concept of programming**

Outcomes:

Students should be able to

1. Identify the components of a computer and their functions.
2. Understand the concept of networking, LAN, Internet, and working of www.
3. Understand the notion of problem solving using computer by programming
4. Understand the notion of Software Project and the Process of software development

Unit-I

Data and Information: Introduction, Types of Data, Simple Model of a Computer, Data Processing Using a Computer, Desktop Computer [Reference 1]

Acquisition of Numbers and Textual Data: Introduction, Input Units, Internal Representation of Numeric Data, Representation of Characters in Computers, Error-Detecting Codes [Reference 1]

Unit-II

Data Storage: Introduction, Storage Cell, Physical Devices Used as Storage Cells, Random Access Memory, Read Only Memory, Secondary Storage, Compact Disk Read Only Memory (CDROM), Archival Store [Reference 1]

Central Processing Unit: Introduction, Structure of a Central Processing Unit, Specifications of a CPU, Interconnection of CPU with Memory and I/O Units, Embedded Processors [Reference 1]

Unit-III

Computer Networks: Introduction, Local Area Network (LAN), Applications of LAN, Wide Area Network (WAN), Internet, Naming Computers Connected to Internet, Future of Internet Technology [Reference 1]

Input Output Devices: Introduction, Keyboard, Video Display Devices, Touch Screen Display, E-Ink Display, Printers, Audio Output [Reference 1]

Computer Software: Introduction, Operating System, Programming Languages, Classification of Programming Languages, Classification of Programming Languages Based on Applications [Reference 1]

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Unit-IV

The Software Problem: Cost, Schedule, and Quality, Scale and Change [Reference 2]
Software Processes: Process and Project, Component Software Processes, Software Development Process Models [Reference 2]
Programming Principles and Guidelines: Structured Programming, Information Hiding, Some Programming Practices, Coding Standards [Reference 2]

References

1. V Rajaraman. Introduction to Information Technology, 3rd Edition, PHI Learning Private Limited, 2018
2. Pankaj Jalote. Concise Introduction toSoftware Engineering, Springer, 2011

B.Sc. I Year I Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - I)

Practical - 1 : Fundamentals of Information Technology (Lab)

[3 HPW :: 1 Credit :: 50 Marks]

Objective

The main objective of this laboratory is to familiarize the students with the basic hardware and software in computers

Exercises

1. Assembly and disassembly of a system box and identifying various parts inside the system box to recognize various parts of a typical computer system
2. Assembly and disassembly of peripheral devices- keyboard and mouse and study of their interface cables, connectors and ports.
3. Installation of Operating Systems-Windows and Linux
4. Disk defragmentation using system tool.
5. Procedure of disk partition and its operation (Shrinking, Extending, Delete, Format).
6. Installing and uninstalling of device drivers using control panel.
7. Working practice on windows operating system and Linux operating system: creating file, folder. Copying, moving, deleting file, folder
8. User Account creation and its feature on Windows Operating System and Changing resolution, color, appearances, and Changing System Date and Time.
9. Installation and using various wireless input devices (Keyboard/Mouse/Scanners etc.,)under Windows/Linux.
10. Study of various types of memory chips and various types of hard disk drives, partition and formatting of hard disk.
11. Installation of scanner, modem and network cards in Windows/Linux.
12. Assembly and disassembly of printer, installing a printer, taking test page, and using printer under Windows/Linux.
13. Installation of application software's – Office Automation, Anti-Virus.
14. Demonstrate the usage of Word and Power point in Windows and Linux
15. Configure Internet connection, Email Account creation, reading, writing and sending emails with attachment.

DEPARTMENT OF COMPUTERS
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B.Sc. I Year II Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - II)

Paper – II : Problem Solving and Python Programming

[4 HPW :: 4 Credits :: 100 Marks (External:80, Internal:20)]

Objectives

The main objective is to teach Computational thinking using Python.

- To know the basics of Programming
- To convert an algorithm into a Python program
- To construct Python programs with control structures.
- To structure a Python Program as a set of functions
- To use Python data structures-lists, tuples, dictionaries.
- To do input/output with files in Python.
- To construct Python programs as a set of objects.

Outcomes:

On completion of the course, students will be able to:

1. Develop algorithmic solutions to simple computational problems.
2. Develop and execute simple Python programs.
3. Develop simple Python programs for solving problems.
4. Structure a Python program into functions.
5. Represent compound data using Python lists, tuples, dictionaries.
6. Read and write data from/to files in Python Programs

Unit-I

Introduction to Computing and Problem Solving: Fundamentals of Computing – Computing Devices – Identification of ComputationalProblems – Pseudo Code and Flowcharts – Instructions – Algorithms – Building Blocks of Algorithms.

Introduction to Python Programming: Python Interpreter and InteractiveMode– Variables and Identifiers – Arithmetic Operators – Values and Types – Statements,Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: The if, The if…else,The if…elif…else Decision Control Statements, Nested if Statement, The while Loop, The for Loop, The continue and break Statements.

Unit-II

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Unit-III

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations andmethods; advanced list processing - list comprehension; Illustrative programs: selection sort,
insertion sort, mergesort, histogram.

Files and exception: text files, reading and writing files, format operator; command line arguments,errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

Unit-IV

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation, Inheritance The Polymorphism.

Functional Programming: Lambda. Iterators, Generators, List Comprehensions.

References:

1. Introduction to Python Programming. Gowrishankar S., Veena A. CRC Press, Taylor & Francis Group, 2019
2. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist'', 2nd edition,Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/think- python/)

Suggested Reading:

1. Learning To Program With Python. Richard L. Halterman. Copyright © 2011
2. Python for Everybody, Exploring Data Using Python 3. Dr. Charles R. Severance. 2016

B.Sc. I Year II Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - II)

Practical - 2 : Problem Solving and Python Programming (Lab)

[3 HPW :: 1 Credit :: 50 Marks]

Objective

The main objective of this laboratory is to put into practice computational thinking. The students will be expected to write, compile, run and debug Python programs to demonstrate the usage of

- variables, conditionals and control structures
- functions (both recursive and iterative)
- basic data types as well as compound data structures such as strings, lists, sets, tuples, dictionaries
- object-oriented programming

Installing Python and Setting up the Environment

Python interpreter can be downloaded for Windows/Linux platform using the link below:
https://www.python.org/downloads/windows/

Exercises

I. Programs to demonstrate the usage of operators and conditional statements

1. Write a program that takes two integers as command line arguments and prints the sum of two integers.
2. Program to display the information:
   Your name, Full Address, Mobile Number, College Name, Course Subjects
3. Program to find the largest number among 'n' given numbers.
4. Program that reads the URL of a website as input and displays contents of a webpage.

II. Programs to demonstrate usage of control structures

5. Program to find the sum of all prime numbers between 1 and 1000.
6. Program that reads set of integers and displays first and second largest numbers.
7. Program to print the sum of first 'n' natural numbers.
8. Program to find the product of two matrices.
9. Program to find the roots of a quadratic equation

III. Programs to demonstrate the usage of Functions and Recursion

10. Write both recursive and non-recursive functions for the following:
    a. To find GCD of two integers
    b. To find the factorial of positive integer
    c. To print Fibonacci Sequence up to given number 'n'
    d. To convert decimal number to Binary equivalent

11. Program with a function that accepts two arguments: a list and a number 'n'. It should display all the numbers in the list that are greater than the given number 'n'.
12. Program with a function to find how many numbers are divisible by 2, 3,4,5,6 and 7 between 1 to 1000

IV. Programs to demonstrate the usage of String functions

13. Program that accept a string as an argument and return the number of vowels and consonants the string contains.
14. Program that accepts two strings S1, S2, and finds whether they are equal are not.
15. Program to count the number of occurrences of characters in a given string.
16. Program to find whether a given string is palindrome or not

V. Programs to demonstrate the usage of lists, sets, dictionaries, tuples and files.

17. Program with a function that takes two lists L1 and L2 containing integer numbers as parameters. The return value is a single list containing the pair wise sums of the numbers in L1 and L2.
18. Program to read the lists of numbers as L1, print the lists in reverse order without using reverse function.
22. Write a program that combine lists L1 and L2 into a dictionary.
19. Program to find mean, median, mode for the given set of numbers in a list.
20. Program to find all duplicates in the list.
21. Program to o find all the unique elements of a list.
22. Program to find max and min of a given tuple of integers.
23. Program to find union, intersection, difference, symmetric difference of given two sets.
24. Program to display a list of all unique words in a text file
25. Program to read the content of a text file and display it on the screen line wise with a line number followed by a colon
26. Program to analyze the two text files using set operations
27. Write a program to print each line of a file in reverse order.

VI. Programs to demonstrate the usage of Object Oriented Programming

28. Program to implement the inheritance
29. Program to implement the polymorphism

VII. Programs to search and sort the numbers

30. Programs to implement Linear search and Binary search
31. Programs to implement Selection sort, Insertion sort

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DEPT OF DATA SCIENCES

TARA GOVT COLLEGE, SANGAREDDY (A)

Syllabus Revision Details for the Academic Year 2021 – 22

S.No.	Course Name	Semester	No of Programmes	No of Programmes with Syllabus Change	Remarks
1	BSc Data Science - I	I	2	1	New Programme was introduced under CBCS
2	BSc Data Science - II	II	2	1	New Programme was introduced under CBCS
3	BSc Data Science - III	III	1	1	Programme was newly introduced
4	BSc Data Science - IV	IV	1	1	Programme was newly introduced
	Total		6	4	

Total No of Courses Offered = 6

No of Courses with Syllabus Revision = 4

% of Courses with Syllabus Revision = 4/6 = 66%

Subject Incharge

Dept Incharge

DEPARTMENT OF COMPUTERS
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Department of Data Science

Board of Studies meeting for the academic year 2021-22

The board of studies meeting for the Department of Data Science is held at Tara GDC Sangareddy, on 21/12/2021 to discuss and finalize the syllabus and examination as well as evaluation pattern for I to VI semesters of B.Sc in the subject of Data Science for the academic year of 2021-22.

The following members are present in the meeting:

S.No.	Name of the Faculty	Designation	Signature
1.	**Smt. Shravani Nethi** Chairman, BOS, Department of Data Science Tara Government College (A), Sangareddy	**Chairperson**	
2.	**Prof.P.V.Sudha** Professor,Department of CSE, UCE, Osmania University, Hyderabad, India.	**University Nominee**	
3.	**Dr.K.Adi Narayana Reddy** Professor, Department of IT, BVRIT College of Engineering for Women, Hyderabad, India	**External Member**	
4.	**M.Anjaneyulu** Faculty of Computer Science & Applications S.R.R.Govt.Arts& Science College, Karimnagar, Satavahana University, Karimnagar, Telanagana, India	**External Member**	
5.	**Dr.S. Nagaprasad** Faculty of Computer Science and Applications Tara Government College (A), Sangareddy	**Member**	
6.	**Sri. M.Krishna** Faculty of Computer Science and Applications Tara Government College (A), Sangareddy	**Member**	

7	**Kum. P.Nilochana** Faculty of Computer Science and Applications Tara Government College (A), Sangareddy	**Member**	P. Nilochana
8.	**A.Vara Prasad** Project Leader Tech. Mahindra Info city, Madhapur, Hyderabad	**Industrialist**	
9.	**T. Sushumna** Alumni Member,Faculty of Mathematics Tara Government College (A), Sangareddy	**Member**	T. sushumna

The following resolutions are taken in the meeting:

1. It is resolved to the follow the syllabus preseribed by Osmania University and to adopt the same for B.Sc.Data Science I to VI Semester without making any changes for the Academic year 2021-22.

2. The pattern of syllabus is kept unchanged for I to VI semesters for theory as well as practical. Each theory paper consists of four units for all the semesters.

3. It is resolved to allot 30 marks for internal examination, 70 marks for end semester examination and 25 marks for Practical examination in each paper. The internal examination marks shall be average of two internals for each semester.

The distribution of internal exam shall be as follows:

A. Internal Exam - 20 marks

B. Assignment - 5 marks

C. Seminar presentation/ Quiz/Group Discussion/ any other activity - 5 marks

4. The Pattern of Regular End Semester Examination for **I to VI Semesters of B.Sc Data Science**will consist of Three Sections for a total of 70 Marks.

A. Short Questions & Answer: Six of Eight with 5 Marks for each – 30 Marks

B. Long Answer Questions: Four of Four (Internal Choice) with 10 Marks for each – 40 Marks.

5. The pattern of semester practical examination - 25 marks.

a. Two questions from Lab Question Bank -2 x 6 = 12 marks

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b. Viva – 8 marks

c. Record – 5 marks

6. There will be no internal assessments for practical examinations.

7. It is discussed and decided to have 30 marks for internal and 70 marks for end semester exam in case of GE: (V Semester) paper.

8. The model question paper prescribed for internal and end semester exams, the reference books and **panel of examiners** is approved.

9. Covid-19 pattern may be adopted for end semester theory exams in case of emergency on par with the parent university.

10. The Pattern of Covid End Semester Examination for **B.Sc Data Science** for **I to VI Semesters** will consist of Two Sections for a total of 70 Marks.

A. Short Questions & Answer: Four out of Eight with 2½ Marks for each – 10 Marks

B. Long Answer Questions: Four out of Eight with 15 Marks for each – 60 Marks

Board of Studies Chairman

University Nominee

Members: 1.

2.

DEPARTMENT OF COMPUTERS
Sangareddy, Sangareddy (Dist).

B.Sc. II Year III Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - III)

Paper – III : Data Engineering with Python

[4 HPW :: 4 Credits :: 100 Marks (External:80, Internal:20)]

Objective: The main objective of this course is to teach how to extract raw data, clean the data, perform transformations on data, load data and visualize the data

Outcomes:

At the end of the course the student will be able to:

- Handle different types of files and work with text data
- Use regular expression operations
- Use relational databases via SQL
- Use tabular numeric data
- Use the data structures: data series and frames
- Use PyPlot for visualization

Unit – I

Data Science: Data Analysis Sequence, Data Acquisition Pipeline, Report Structure [Reference 1(Chapter 1-Unit1 to Unit 3)]]

Files and Working with Text Data: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.pathModules. [Reference 2, Chapter 9)]

Working with Text Data: JSON and XML in Python[Reference 2, Section12.2]

Unit – II

Working with Text Data: Processing HTML Files, Processing Texts in Natural Languages [Reference 1(Chapter3 –Unit 13, and Unit16)

Regular Expression Operations: Using Special Characters, Regular Expression Methods, Named Groups in Python Regular Expressions, Regular Expression with *glob* Module [Reference 2-Chapter 10]

Unit – III

Working with Databases: Setting Up a MySQL Database, Using a MySQL Database: Command Line, Using a MySQL Database, Taming Document Stores: MongoDB [Reference 1 (Chapter4-Unit17toUnit20)]

Working with Tabular Numeric Data(Numpy with Python): NumPy Arrays Creation Using *array()* Function, Array Attributes, NumPy Arrays Creation with Initial Placeholder Content, Integer Indexing, Array Indexing, Boolean ArrayIndexing, Slicing and Iterating in Arrays, Basic Arithmetic Operations on NumPy Arrays, Mathematical Functions in NumPy, Changing the Shape of an Array, Stacking and Splitting of Arrays, Broadcasting in Arrays. [Reference 2: Section 12.3)]

Unit – IV

Working with Data Series and Frames: Pandas Data Structures, Reshaping Data, Handling Missing Data, Combining Data, Ordering and Describing Data, Transforming Data, Taming Pandas File I/O [Reference 1 (Chapter 6-Unit 31 to Unit 37)]

Plotting: Basic Plotting with PyPlot, Getting to Know Other Plot Types, Mastering Embellishments, Plotting with Pandas [Reference 1 (Chapter8-Unit 41 to Unit 44)]

References:

1. Data Science Essentials in Python: Collect, Organize, Explore, Predict, Value. Dmitry Zinoriev, The Pragmatic Programmers LLC, 2016
2. Introduction to Python Programming. Gowrishankar S., Veena A. CRC Press, Taylor & Francis Group, 2019

Suggested Reading

3. Python for Everybody: Exploring Data Using Python 3. Charles R Severance, 2016
4. Python Data Analytics – Data Analysis and Science using Pandas, matplotlib and the Python Programming Language. Fabio Nelli, Apress, 2015
5. Website Scraping with Python. Using BeautifulSoup and Scrapy. GáborLászlóHajba, Apress, 2018
6. Machine Learning with Python Cookbook:.Practical Solutions from Preprocessing to Deep Learning. Chris Albon, O'Reilly 2018

B.Sc. II Year III Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - III)

Practical - 3 : Data Engineering with Python (Lab)

[3 HPW :: 1 Credit :: 50 Marks]

Objective:
The main objective of this laboratory is to put into practice the ETL (extract, transform, load) pipeline which will extract raw data, clean the data, perform transformations on data, load data and visualize the data.

This requires mentoring by TCS.

Libraries
In this course students are expected to extract, transform and load input data that can be text files, CSV files, XML files, JSON, HTML files, SQL databases, NoSQL databases etc.,. For doing this, they should learn the following Python libraries/modules:
pandas, numpy, BeautifulSoup, pymysql, pymongo, nltk, matplotlib

Datasets
For this laboratory, appropriate publicly available datasets, can be studied and used.
Example:
MNIST (http://yann.lecun.com/exdb/mnist/),
UCI Machine Learning Repository(https://archive.ics.uci.edu/ml/datasets.html),
Kaggle(https://www.kaggle.com/datasets)
Twitter Data

Exercises

1. Write programs to parse text files, CSV, HTML, XML and JSON documents and extract relevant data. After retrieving data check any anomalies in the data, missing values etc.
2. Write programs for reading and writing binary files
3. Write programs for searching, splitting, and replacing strings based on pattern matching using regular expressions
4. Design a relational database for a small application and populate the database. Using SQL do the CRUD (create, read, update and delete) operations.
5. Create a Python MongoDB client using the Python module pymongo. Using a collection object practice functions for inserting, searching, removing, updating, replacing, and aggregating documents, as well as for creating indexes
6. Write programs to create numpy arrays of different shapes and from different sources, reshape and slice arrays, add array indexes, and apply arithmetic, logic, and aggregation functions to some or all array elements
7. Write programs to use the pandas datastructures: Frames and series as storage containers and for a variety of data-wrangling operations, such as:
    - Single-level and hierarchical indexing
    - Handling missing data
    - Arithmetic and Boolean operations on entire columns and tables
    - Database-type operations (such as merging and aggregation)

- Plotting individual columns and whole tables
- Reading data from files and writing data to files

B.Sc. II Year IV Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - IV)

Paper – IV : Machine Learning

[4 HPW :: 4 Credits :: 100 Marks (External:80, Internal:20)]

Objectives: The main objective of this course is to teach the principles and foundations of machine learning algorithms

Outcomes:

At the end of the course the student will be able to understand

- Basics of Machine Learning and its limitations
- Machine Learning Algorithms: supervised, unsupervised, bio-inspired
- Probabilistic Modeling and Association Rule Mining

Unit-I

Introduction: What does it mean to learn, Some canonical Learning Problems, The Decision Tree Model of Learning, Formalizing the Learning Problem [Reference 1], ID3 Algorithm [[Reference 2]

Limits of Learning: Data Generating Distributions, Inductive Bias, Not Everything is learnable, Underfitting and Overfitting, Separation of training and test Data, Models, parameters and Hyperparameters, Real World Applications of Machine Learning [Reference 1]

Geometry and Nearest Neighbors: From Data to Feature Vectors, k-Nearest Neighbors, Decision Boundaries, k-means Clustering, High Dimensions [Reference 1]

Unit-II

The Perceptron: Bio-inspired Learning, The Perceptron Algorithm, Geometric Interpretation, Interpreting Perceptron Weights, Perceptron Convergence and Linear Separability, Improved Generalization, Limitations of the Perceptron [Reference 1]

Practical Issues: Importance of Good Features, Irrelevant and Redundant Features, Feature Pruning and Normalization, Combinatorial Feature Explosion, Evaluating Model Performance, Cross Validation, Hypothesis Testing and Statistical Significance, Debugging Learning Algorithms, Bias Variance tradeoff [Reference 1]

Linear Models: The Optimization Framework for Linear Models, Convex Surrogate Loss Functions, Weight Regularization, Optimization and Gradient Descent, Support Vector Machines [Reference 1]

Unit-III

Probabilistic Modeling: Classification by Density Estimation, Statistical Estimation, Naïve Bayes Models, Prediction [Reference 1]

Neural Networks: Bio-inspired Multi-Layer Networks, The Back-propagation Algorithm, Initialization and Convergence of Neural Networks, Beyond two layers, Breadth vs Depth, Basis Functions [Reference 1]

Unit IV

Unsupervised Learning: Clustering Introduction, Similarity and Distance Measures, Agglomerative Algorithms, Divisive Clustering, Minmum Spanning Tree [Reference 2]
Association Rules: Introduction, large Itemsets, Apriori Algorithm [Reference 2]

References:

1. A Course in Machine Learning (CIML). Hal Daume III, 2017 (freely available online) http://ciml.info/
2. Data Mining: Introductory and Advanced Topics. Margaret H Dunham, Pearson Education, 2003

Suggested Reading:

3. Hands on Machine Learning with SciKit-Learn, Keras and Tensor Flow. AurélienGéron. O'Reily, 2019
4. Machine Learning with Python Cookbook. Chris Albo, O'Reily, 2018
5. Introduction to Machine Learning with Python: A guide. Andreas C Miller, Sarah Guido. O'Reily, 2017

B.Sc. II Year IV Semester (CBCS) : Data Science Syllabus

(With Mathematics Combination)

(Examination at the end of Semester - IV)

Practical - 4 : Machine Learning (Lab)

[3 HPW :: 1 Credit :: 50 Marks]

Objective:

The main objective of this laboratory is to put into practice the various machine learning algorithms for data analysis using Python and Weka.

ML Toolkits

Students are expected to learn

1. Scikit-learn(https://scikit-learn.org/) an open source machine learning Python library that supports supervised and unsupervised learning. It also provides various tools for model fitting, data preprocessing, model selection and evaluation, and many other utilities.
2. Weka (http://www.cs.waikato.ac.nz/ml/weka/)is another widely used ML toolkit.

Datasets

1. The sklearn.datasets package embeds small toy datasets. It includes utilities to load these datasets. It also includes methods to load and fetch popular reference datasets and features some artificial data generators. Students are expected to study and make use of these datasets
2. Weka also has provides various data sets.

References:

1. scikit-learn user guide.https://scikit-learn.org/stable//_downloads/scikit-learn-docs.pdf
2. Ian Witten, Eibe Frank, and Mark Hall, Chris Pal. DATA MINING: Practical Machine Learning Tools and Techniques, 4th Edition. Morgan Kaufmann.

Exercises

8. Write a Python program using Scikit-learn to split the iris dataset into 70% train data and 30% test data. Out of total 150 records, the training set will contain 120 records and the test set contains 30 of those records. Print both datasets
9. Write Python program to use sklearn'sDecisionTreeClassifier to build a decision tree for the sklearn's datasets. Implement functions to find the importance of a split (entropy, information gain, gini measure)
10. Write a Python program to implement your own version of the K-means algorithm. Then apply it to different datasets and evaluate the performance.
11. Design a perceptron classifier to classify handwritten numerical digits (0-9). Implement using scikit or Weka.
12. Write a Python program to classify text as spam or not spam using the Naïve Bayes Classifier
13. Use WEKA and experiment with the following classifiers: Association Rule Mining (Apriori), Agglomerative and Divisive Clustering.

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