

B.Sc. (Physics) Syllabus, Kakatiya University, Warangal  
CBCS pattern in Semester System (w. e. from 2016-2017)



DEPARTMENT OF PHYSICS  
KAKATIYA UNIVERSITY  
WARANGAL-506 009

Department of Physics, Kakatiya University offers Physics and Electronics as core subjects at UG level (3 Year course) with six semesters with internal assessment for theory papers under Choice Based Credit System (CBCS) in University constituent and affiliated colleges for the students admitted in first year from 2016-17 academic year onwards.

1. Each of first four Semesters (i.e I, II III and IV) contains one theory core paper (20 marks for Internal Assessment and 80 marks for Semester End Exam equivalent to 4 credits) as Discipline Specific Course (DSC) and one practical paper (25 marks equivalent to 01 credit), whereas each of last two semesters (i.e V and VI) contains one theory core paper as DSC (15 marks for Internal Assessment and 60 marks for Semester End Exam equivalent to 3 credits), one theory elective paper as Discipline Specific Elective (DSE) (15 marks for Internal Assessment and 60 marks for Semester End Exam equivalent to 3 credits) and two practical papers (One for DSC and the other for DSE carries 25 marks in each paper equivalent to 01 credit). Total marks are 900 and credits are 36 for Physics course.
2. Internal Assessment examination will be conducted twice in every Semester. Marks will be awarded from the average of the two Internal Assessment Exams in each Semester.
3. Scheme for CBCS, work-load for each paper, distribution of marks and credits; and scheme of question paper for Physics are attached herewith.
4. The practical examination will be conducted at the end of each semester. A minimum of 40% marks should be obtained by the student to pass the practical examination of Physics in all semesters.
5. All the theory papers and practical papers of Physics in I, II, III, IV and DSC paper of V & VI semesters are common to all students. But, elective theory (DSE) papers of Physics in V and VI Semesters are to be chosen by the student from the available options.
6. Elective (DSE) papers of Physics will be offered separately at the beginning of Semesters V and VI. Every student has to choose one elective from the Electives being offered.

Dr. B. Venkatram Reddy

Chairman, Board of Studies in Physics, KU, Wgl

Date: 24<sup>th</sup> Aug., 2016 & 5<sup>th</sup> June, 2017

T.K. J.L.  
Principal

Govt. Degree College  
Luxettipet-504 215, Dist. Manoheral.

**B.Sc. (Physics) Syllabus, Kakatiya University, Warangal**  
**CBCS pattern in Semester System (w. e. from 2016-2017)**

**KAKATIYA UNIVERSITY, WARANGAL**  
**SCHEME FOR CHOICE BASED CREDIT SYSTEM**  
**B.Sc. (PHYSICS)**  
**SEMESTER PATTERN**

YEAR	SEM	COURSE (PAPER) TITLE WITH CODE	COURSE TYPE*	HRS/WEEK	CREDITS	MARKS	
						Internal Assessment	SEM End Exam
F I R S T	I	101: Mechanics	DSC-1	4	4	20	80
		101(P): Mechanics Lab (Pr)	DSC-1(P)	3	1	-	25
	II	201: Waves and Oscillations	DSC-2	4	4	20	80
		201(P): Waves and Oscillations Lab (Pr)	DSC-2(P)	3	1	-	25
S E C O N D	III	301: Thermal Physics	DSC-3	4	4	20	80
		301(P): Thermal Physics Lab (Pr)	DSC-3(P)	3	1	-	25
	IV	401: Optics	DSC-4	4	4	20	80
		401(P): Optics Lab (Pr)	DSC-4(P)	3	1	-	25
T H I R D	V	501: Electromagnetism	DSC-5	3	3	15	60
		501(P): Electromagnetism Lab (Pr)	DSC-5(P)	3	1	-	25
		502: Elective (Theory) – 1 (A/B/C) A. Solid state physics B. Modern Optics	DSE-1	3	3	15	60
		502(P): Elective (Practical) - 1 (A/B/C) A. Solid state physics Lab B. Modern Optics Lab	DSE-1(P)	3	1	-	25
	VI	601: Modern Physics	DSC-6	3	3	15	60
		601(P): Modern Physics Lab (Pr)	DSC-6(P)	3	1	-	25
		602: Elective (Theory) – 2 (A/B/C) A. Basic Electronics B. Physics of Semiconductor devices	DSE-2	3	3	15	60
		602(P): Elective (Practical) – 2 (A/B/C) A. Basic Electronics Lab B. Physics of Semiconductor devices Lab	DSE-2(P)	3	1	-	25
		<b>Total</b>			<b>36</b>	<b>140</b>	<b>760</b>
						<b>Grand Total : 900</b>	

\*DSC: Discipline Specific Course (Core)      DSE: Discipline Specific Elective (Elective)

*R. Venkatram Reddy*

Dr. B. Venkatram Reddy  
 Chairman, Board of Studies in Physics, KU, Wgl  
 Date: 24<sup>th</sup> Aug., 2016 & 5<sup>th</sup> June, 2017

*D. K. J. L.*  
 Principal  
 Govt. Degree College  
 Luxettipet-504 215, Dist. Mancherial.

**B.Sc. (Physics) Syllabus, Kakatiya University, Warangal**  
**CBCS pattern in Semester System (w. e. from 2016-2017)**

**KAKATIYA UNIVERSITY, WARANGAL**  
**SCHEME FOR CHOICE BASED CREDIT SYSTEM**  
**B.Sc. (PHYSICS)**  
**SEMESTER PATTERN**

YEAR	SEM	COURSE (PAPER) TITLE WITH CODE	COURSE TYPE*	HRS/WEEK	CREDITS	MARKS	
						Internal Assessment	SEM End Exam
F I R S T	I	101: Mechanics	DSC-1	4	4	20	80
		101(P): Mechanics Lab (Pr)	DSC-1(P)	3	1	-	25
	II	201: Waves and Oscillations	DSC-2	4	4	20	80
		201(P): Waves and Oscillations Lab (Pr)	DSC-2(P)	3	1	-	25
S E C O N D	III	301: Thermal Physics	DSC-3	4	4	20	80
		301(P): Thermal Physics Lab (Pr)	DSC-3(P)	3	1	-	25
	IV	401: Optics	DSC-4	4	4	20	80
		401(P): Optics Lab (Pr)	DSC-4(P)	3	1	-	25
T H I R D	V	501: Electromagnetism	DSC-5	3	3	15	60
		501(P): Electromagnetism Lab (Pr)	DSC-5(P)	3	1	-	25
		502: Elective (Theory) – 1 (A/B/C) A. Solid state physics B. Modern Optics	DSE-1	3	3	15	60
		502(P): Elective (Practical) - 1 (A/B/C) A. Solid state physics Lab B. Modern Optics Lab	DSE-1(P)	3	1	-	25
	VI	601: Modern Physics	DSC-6	3	3	15	60
		601(P): Modern Physics Lab (Pr)	DSC-6(P)	3	1	-	25
		602: Elective (Theory) – 2 (A/B/C) A. Basic Electronics B. Physics of Semiconductor devices	DSE-2	3	3	15	60
		602(P): Elective (Practical) – 2 (A/B/C) A. Basic Electronics Lab B. Physics of Semiconductor devices Lab	DSE-2(P)	3	1	-	25
		<b>Total</b>			<b>36</b>	<b>140</b>	<b>760</b>
						<b>Grand Total : 900</b>	

\*DSC: Discipline Specific Course (Core)      DSE: Discipline Specific Elective (Elective)

*(Signature)*

Dr. B. Venkatram Reddy  
 Chairman, Board of Studies in Physics, KU, Wgl  
 Date: 24<sup>th</sup> Aug., 2016 & 5<sup>th</sup> June, 2017

*(Signature)*  
 Principal  
 Govt. Degree College  
 Luxettipet- 504 215, Dist. Mancherial.

### Proposed Scheme for Choice Based Credit System in B.Sc. Chemistry

Semester	Title	Course type	Hrs/week	No. of Credits	Main exam	Internal exam	Total
I	Chemistry-I (T)	DSC-I	4	4	80	20	100
	Chemistry -I (P)	DSC-IA	2	1	25	---	25
II	Chemistry-II (T)	DSC-II	4	4	80	20	100
	Chemistry -II (P)	DSC-IIA	2	1	25	---	25
III	Chemistry-III (T)	DSC- III	4	4	80	20	100
	Chemistry-III (P)	DSC-III A	2	1	25	---	25
IV	Chemistry-IV (T)	DSC-IV	4	4	80	20	100
	Chemistry-IV (P)	DSC-IVA	2	1	25	---	25
V	Chemistry-V (T)	DSC-V	3	3	60	15	75
	Chemistry -V (P)	DSC-VA	2	1	25	—	25
	Elective-I (T) A/B/C	DSE-I (T)	3	3	60	15	75
	Elective -I (P)	DSE-I (P)	2	1	25	—	25
VI	Chemistry-VI (T)	DSC-VI	3/3/3	3	60	15	75
	Chemistry -VI (P)	DSC-VI A	2/2/2	1	25	---	25
	Elective -II (T) A/B/C	DSE-II (T)	3/3/3	3	60	15	75
	Elective -II (P)	DSE-II (P)	2/2/2	1	25	-	25
<b>Total</b>			<b>64</b>	<b>36</b>			<b>900</b>

(T) = Theory; (P) = practical; DSC = Discipline specific course (Core subject); DSE = Discipline Specific Elective (Elective from core Discipline)

*M. M. M. M. M.*

Dean

*G. Dayakar*

Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 2

*T. K. J.*

Principal

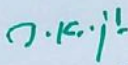
Govt. Degree College

Luxettipet-504 215, Dist. Mancherial.

PROPOSED SCHEME FOR B.Sc PROGRAMME  
UNDER CHOICE BASED CREDIT SYSTEM

<i>FIRST YEAR SEMESTER-I</i>				
<i>Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>HPW</i>	<i>Crdeits</i>
BS 104	Optional I	D.Sc -A	4 T 2 P = 6	4 + 1 = 5
<b>Paper-I Microbial Diversity of Lower Plants</b>				
<i>SEMESTER-II</i>				
<i>Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>HPW</i>	<i>Crdeits</i>
BS 201	Environmental Studies	AECC-2	2	2
BS204	Optional-I	DSC-1B	4 T + 2P = 6	4 + 1 = 5
<b>Paper-II Bryophytes Pteridophytes, Gymnosperms and Palaeobotany</b>				
<i>SECOND YEAR SEMESTER-III</i>				
<i>Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>HPW</i>	<i>Crdeits</i>
BS304	Optional-I	DSC-1C	4 T + 2 P = 6	4 + 1 = 5
<b>Paper-III Taxonomy of Angiosperms and Medicinal Botany</b>				
<i>SEMESTER-IV</i>				
<i>Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>HPW</i>	<i>Crdeits</i>
BS404 ✓	Optional - I	DSC-ID	4 T + 2P = 6	4 + 1 = 5
<b>Plant Anatomy, Embryology and Palynology</b>				
<i>THIRD YEAR SEMESTER-V</i>				
<i>Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>HPW</i>	<i>Crdeits</i>
BS 503	Optional-I	DSC - IE	3 T + 2P = 5	3 + 1 = 4
<b>Paper-V: Cell Biology and Genetics</b>				
BS 506	Optional I A/B	DSE-I#	3T + 2P = 5	3 + 1 = 4
<b>Elective-I Ecology and Biodiversity / Elective II: Horticulture</b>				
<i>SEMESTER-VI</i>				
<i>Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>HPW</i>	<i>Crdeits</i>
BS 603	Optional-I	DSC - 1F	3 T + 2P = 5	3 + 1 = 4
<b>Paper-VIII : Plant Physiology</b>				
BS 606	Optional A/B/	DSE - IF	3 T + 2P = 5	3 + 1 = 4
<b>Elective III Tissue Culture and Biotechnology / Elective-IV: Seed Technology</b>				

AECC: Ability Enhancement Compulsory Course: DSC: Discipline Specific Course:  
DSE : Discipline Specific Elective

  
 Principal  
 Govt. Degree College  
 Luxettipet- 504 215, Dist: Mancherial.



## B.Sc. CHEMISTRY CBCS PATTERN IN SEMESTER SYSTEM

### DEPARTMENT OF CHEMISTRY KAKATIYA UNIVERSITY WARANGAL – 506 009

Department of Chemistry, Kakatiya University introduces semester wise Choice Based Credit System (CBCS) at UG level (3 Year course) chemistry as core subject along with Discipline Specific Electives (DSE) in constituent and affiliated colleges of Kakatiya University for the students admitted in the first year from 2016-17 academic year onwards.

Scheme for CBCS, the workload for each paper, distribution of marks, the number of credits and scheme of examination are herewith attached along with model papers.

Internal Assessment examination will be conducted twice in every Semester. Marks will be awarded from the average of the two Internal Assessment Exams in each Semester.

The main examination (theory and practical) will be conducted at the end of the semester.

All the theory papers and practical papers for I, II, III and IV semesters are common to all students. But, one elective (DSE) to be chosen by the student from the available options in V and VI Semesters.

The syllabi of theory and practical papers of I, II, III and IV semesters are enclosed. The syllabi of V and VI semesters will be kept available for the next academic year.

**Prof. Gade Dayakar**  
Chairperson  
Board of Studies in Chemistry  
Kakatiya University - Warangal

Dean

Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

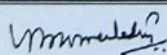
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Mancherial.

Page 1

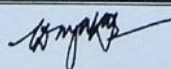
### Proposed Scheme for Choice Based Credit System in B.Sc. Chemistry

Semester	Title	Course type	Hrs/week	No. of Credits	Main exam	Internal exam	Total
I	Chemistry-I (T)	DSC-I	4	4	80	20	100
	Chemistry -I (P)	DSC-1A	2	1	25	---	25
II	Chemistry-II (T)	DSC-II	4	4	80	20	100
	Chemistry -II (P)	DSC-IIA	2	1	25	---	25
III	Chemistry-III (T)	DSC- III	4	4	80	20	100
	Chemistry-III (P)	DSC-IIIA	2	1	25	---	25
IV	Chemistry-IV (T)	DSC-IV	4	4	80	20	100
	Chemistry-IV (P)	DSC-IVA	2	1	25	---	25
V	Chemistry-V (T)	DSC-V	3	3	60	15	75
	Chemistry -V (P)	DSC-VA	2	1	25	---	25
	Elective-I (T) A/B/C	DSE-I (T)	3	3	60	15	75
	Elective -I (P)	DSE-I (P)	2	1	25	--	25
VI	Chemistry-VI (T)	DSC-VI	3/3/3	3	60	15	75
	Chemistry -VI (P)	DSC-VI A	2/2/2	1	25	---	25
	Elective -II (T) A/B/C	DSE-II (T)	3/3/3	3	60	15	75
	Elective -II (P)	DSE-II (P)	2/2/2	1	25	-	25
<b>Total</b>			<b>64</b>	<b>36</b>			<b>900</b>

(T) = Theory; (P) = practical; DSC = Discipline specific course (Core subject); DSE = Discipline Specific Elective (Elective from core Discipline)

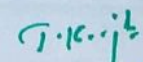


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 2

  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Manjerial.

**B.Sc. ZOOLOGY SYLLABUS UNDER CBCS**

(With effect from 2016-2017)

**I - SEMESTER**

**DSC-1A (Theory)**

**Animal Diversity – Invertebrates**

**Max. Marks: 80**

**UNIT – I**

- 1.1 Kingdom Animalia, Brief history of Invertebrates.
- 1.2 Protozoa General characters and Classification up to classes with examples.
- 1.3 Type study of *Elphidium*, Life cycle of *Plasmodium*. Locomotion, Reproduction and Diseases of protozoans.
- 1.4 Porifera General characters, Classification of up to classes with examples.
- 1.5 Type study of *Sycon*; Canal system in sponges and Spicules.

**UNIT – II**

- 2.1 General characters and Classification of Cnidaria up to classes with examples.
- 2.2 Type study of *Obelia*, Polymorphism in hydrozoa; Corals and coral reef formation.
- 2.3 General characters and Classification of Platyhelminthes up to classes with examples.
- 2.4 Type study- *Schistosoma*; Parasitic Adaptations in Helminthes.
- 2.5 Nematelminthes General characters, Classification of Nematelminthes up to classes with examples; Type study of *Dracunculus*.

**UNIT – III**

- 3.1 Annelida General characters and Classification up to classes with examples.
- 3.2 Type study of *Hirudinaria granulosa*.
- 3.3 Evolutionary significance of Coelome and Coelomoducts and metamerism.
- 3.4 Arthropoda General characters and Classification of Arthropoda up to classes with examples.
- 3.5 Type study of Prawn; Mouth parts of Insects; Insect metamorphosis; *Peripatus* - Structure and affinities.

**UNIT – IV**

- 4.1 Mollusca General characters and Classification up to classes with examples.
- 4.2 Type study – *Pila*; Pearl formation; Torsion and detorsion in gastropods.
- 4.3 Echinodermata General characters and Classification of Echinodermata up to classes with examples.
- 4.4 Water vascular system in star fish; Echinoderm larvae and their significance.
- 4.5 Hemichordata General characters and Classification up to classes with examples; *Balanoglossus* - Structure and affinities.

T.K.J.  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.



Department of Commerce & Business Management, Kakatiya University, Warangal - 506009

*B.Com Common Core Syllabi under CBCS (wef 2016-17)*

STRUCTURE OF B.Com- DEGREE COURSE under CBCS for ALL STREAMS

{B.Com, B.Com (Computer Applications), B.Com (Taxation), B.Com (Tax Procedures & Practices), B.Com (Corporate Secretary ship),  
B.Com (Advertising and Sales Management) and B.Com (Insurance)}

w.e.f. ACADEMIC YEAR 2016-17

FIRST YEAR :SEMESTER-I						
Code	Title of the Paper	Course Type	HPW	Credits	Exam Duration	Max. Marks
BC101-Common to all	Communication	AECC-1	2	2		
BC102- Common to all	English	CC-1A	5	5		
BC103- Common to all	Second Language	CC-2A	5	5		
BC104-Common to all	Financial Accounting - I	DSC-1A	5L+1T=6	6		
BC105- Common to all	Business Economics	DSC-2A	6	6		
BC106- Common to all	Business Organization	DSC-3A	4	4		
BC107- Common to all	Information Technology	DSC-4A	4	4		
	Total			32		

FIRST YEAR :SEMESTER-II						
Code	Title of the Paper	Course Type	HPW	Credits	Exam Duration	Max. Marks
BC201-Common to all	Environmental Science	AECC-2	2	2		
BC202- Common to all	English	CC-1B	5	5		
BC203- Common to all	Second Language	CC-2B	5	5		
BC204-Common to all	Financial Accounting - II	DSC-1B	5L+1T=6	6		
BC205- Common to all	Managerial Economics	DSC-2B	5L+1T=6	6		
BC206- Common to all	Principles of Management	DSC-3B	4	4		
BC207- Common to all	Foreign Trade	DSC-4B	4	4		
	Total			32		

5

  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancheral.



Theory: 4 credits and Practicals: 1 credit  
Theory: 4 hours /week and Practicals: 2 hours /week

Objective: The course is aimed at exposing the students to some basic notions in differential calculus .

Outcome: By the time students completes the course they realize wide ranging applications of the subject.

Unit- I

Successive differentiation- Expansions of Functions- Mean value theorems

Unit - II

Indeterminate forms – Curvature and Evolutes

Unit - III

Partial differentiation – Homogeneous functions- Total derivative

Unit - IV

Maxima and Minima of functions of two variables - Lagrange's Method of multipliers -Asymptotes- Envelopes

**Text :** Shanti Narayan and Mittal, *Differential Calculus*

**References:** William Anthony Granville, Percy F Smith and William Raymond Longley, *Elements of the differential and integral calculus*

Joseph Edwards , *Differential calculus for beginners*

Smith and Minton, *Calculus*

Elis Pine, *How to Enjoy Calculus*

Hari Kishan *Differential Calculus*

**B.A.**  
**GENERAL STREAM WITH NO COMPUTER**  
**COURSE AS CORE SUBJECT**

**B.A. FIRST YEAR**

**THEORY PAPER - I**  
**INTRODUCTION TO COMPUTERS**

**UNIT - I : Exploring Computers**

**Exploring Computers and their uses :**

Overview: Computers in our world. The computer defined. Computers for individual users. Computers for organizations. Computers in society. Why are computers so important.

**Looking inside the computer system:**

Overview : Detecting the ultimate machine. The parts of a computer system. The information processing cycle, Essential computer hardware: Processing devices, Memory devices, Input and output devices. Storage devices, System software. Application software, Computer data, Computer users.

**Using the keyboard and mouse:**

Overview : The keyboard and mouse, The keyboard. How the computer accepts input from the keyboard. The mouse, Variants of the mouse. Ergonomics and input devices.

**Inputting data in other ways :**

Overview : Options for every need and preference. Devices for hand, Optical input devices, Audio-visual input devices.

**Video and Sound :**

Overview: Reaching our senses with sight and sound. Monitors, Ergonomics and monitors, Data projectors, Sound systems.

**UNIT – 2 : Storage Devices and Operating System Basics**

**Printing :**

Overview: putting digital content in your hands, Commonly used printers, High-quality printers, Thermal-wax printers, Dye-sublimation printers, Plotters.

### **Transforming data in information :**

Overview : The difference between data and information. How computers represent data, How computers process data, Machine cycles, Memory, Factors effecting processing speed, The computer's internal clock, The Bus, Cache memory.

### **Types of storage devices :**

Overview: An ever-growing need, Categorizing storage devices, Magnetic storage devices—How data is stored on a disk, How data is organized on a magnetic disk, How the operating system finds data on a disk, Diskettes, hard disks, Removable high-capacity magnetic disks, Tape drivers, Optical storage devices, Solid-state storage devices, Smart cards, Solid-state disks.

### **Operating system basics :**

Overview : The purpose of operating systems, Types of operating systems, Providing a user interface, Running programs, Managing hardware, Enhancing an OS utility software.

### **Networking Basics :**

Overview: Sharing data anywhere, anytime. The uses of a network, Common types of networks, Hybrid networks, How networks are structured. Network topologies and protocols, Network media. Network hardware.

## **UNIT – 3 : Data Communication and Computer Programs**

### **Data Communications :**

Overview : The local and global reach of networks, Data communications with standard telephone lines and modems, Modems, uses of a modem, Using digital data connection Broad band connections, Wireless networks.

### **Productivity Software :**

Overview : Software to accomplish the work of life, Acquiring software, commercial software, Freeware and public domain software. Open-source software, Word processing programs, Spreadsheet programs, Presentation programs, Presenting information managers.

### **Database management Systems :**

Overview : The mother of all computer applications, Databases and

Database Management Systems, Working with a database.

### **Creating Computer programs :**

Overview : What is a computer program. Hardware interaction, Code, machine code, programming languages, Compilers and interpreters, Planning a computer program, How programs solve problems.

### **Programming languages and the programming process :**

Overview : The keys to successful programming. The evolution of programming language. World wide web development languages. The Systems development life cycle for programming.

## **UNIT - 4 : MS-Word**

**Word Basics :** Starting word, Creating a new document, Opening preexisting document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Formatting Text and Documents : Auto format, Line spacing, Margins, Borders and Shading.

**Headers and Footers :** Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

**Tables :** Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting a table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width.

**Graphics :** Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

**Templates :** Template types, using templates, exploring templates, modifying templates.

**Macro :** Macro, Record in a macros, editing macros, running a macro.

**Mail Merge :** Mail Merge concept, Main document, data sources, merging data sources and main document, Overview of word menu options word basic tool bar.

**DEPARTMENT OF ENGLISH  
KAKATIYA UNIVERSITY**

*UG I Semester*

<b>LESSON ONE (SHORT FICTION)</b>	<b>TEXT</b>	<b>OLD MAN AT THE BRIDGE by Ernest Hemmingway</b>
	PRONUNCIATION	CONSONANTAL SOUNDS
	GRAMMAR	ARTICLES
	VOCABULARY	SYNONYMS
	SPELLING	PICK OUT THE WRONGLY-SPELT WORDS
	CONVERSATIONS	ICE-BREAKING
	READING PASSAGE	RUDRAMA DEVI
	LIFE SKILLS	SELF-AWARENESS
<b>LESSON TWO (PROSE)</b>	<b>TEXT</b>	<b>INDIA AND DEMOCRACY by Dr.B.R.AMBEDKAR</b>
	PRONUNCIATION	VOWEL SOUNDS: MONOPHTHONGS
	GRAMMAR	PREPOSITIONS
	VOCABULARY	ANTONYMS
	SPELLING	USE OF 'UN' OR 'DIS'
	CONVERSATIONS	INTRODUCING
	READING PASSAGE	MEDARAM JATARA
	LIFE SKILLS	EMPATHY
<b>LESSON THREE (POETRY)</b>	<b>TEXT</b>	<b>THE SCRIBE by WALTER DE LA MARE</b>
	PRONUNCIATION	VOWEL SOUNDS: DIPHTHONGS
	GRAMMAR	TENSES
	VOCABULARY	HOMOPHONES & HOMONYMS
	SPELLING	USE OF 'TION' OR 'SION'
	CONVERSATIONS	DESCRIBING A PERSON/PLACE/EVENT
	READING PASSAGE	KALOJI
	LIFE SKILLS	CRITICAL THINKING & CREATIVE THINKING SKILLS
<b>LESSON FOUR (DRAMA)</b>	<b>TEXT</b>	<b>THE NEVER-NEVER NEST by CEDRIC MOUNT</b>
	PRONUNCIATION	PLOSIVES
	GRAMMAR	FRAMING QUESTIONS
	VOCABULARY	ONE-WORD SUBSTITUTES
	SPELLING	USE OF 'MENT'
	CONVERSATIONS	GIVING DIRECTIONS
	READING PASSAGE	KUNTALA WATERFALL
	LIFE SKILLS	DECISION-MAKING SKILL

1. Alcott

2. D. H. Lawrence

3. W. G. Sebald

4. Stephen Crane

5. S. K. Prasad

6. Shakespeare

*N.K.J.*  
Principal

Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

Department of English  
Kakatiya University  
UG II Semester

<b>LESSON FIVE (SHORT FICTION)</b>	<b>TEXT</b>	<b>THE RELUCTANT PHILANTHROPIST by GOLLAPUDI SRINIVASA RAO</b>
	PRONUNCIATION	FRICATIVES
	GRAMMAR	DISCOURSE MARKERS
	VOCABULARY	IDIOMS & PHRASES
	SPELLING	USE OF 'IE' AND 'EI'
	CONVERSATIONS	SEEKING INFORMATION
	READING PASSAGE	BATHUKAMMA
	LIFE SKILLS	PROBLEM-SOLVING SKILL
<b>LESSON SIX (PROSE)</b>	<b>TEXT</b>	<b>HOW SHOULD ONE READ A BOOK by VIRGINIA WOOLF</b>
	PRONUNCIATION	AFFRICATES & NASALS
	GRAMMAR	VOICE & DEGREES OF COMPARISON
	VOCABULARY	PHRASAL VERBS
	SPELLING	USE OF 'ABLE' & 'IBLE'
	CONVERSATIONS	ORGANIZING A MEETING/INVITING GUESTS
	READING PASSAGE	RAMAPPA
	LIFE SKILLS	EFFECTIVE COMMUNICATION SKILL
<b>LESSON SEVEN (POETRY)</b>	<b>TEXT</b>	<b>AFTER BLENHEIM by ROBERT SOUTHEY</b>
	PRONUNCIATION	LATERALS, SEMI-VOWELS
	GRAMMAR	REPORTING SPEECH & QUESTION TAGS
	VOCABULARY	LEXIS/WORD-BUILDING
	SPELLING	USE OF PREFIXES & SUFFIXES
	CONVERSATIONS	ORGANIZING A MEETING/PROPOSING A VOTE OF THANKS
	READING PASSAGE	BONALU
	LIFE SKILLS	INTER-PERSONAL RELATIONSHIPS
<b>LESSON EIGHT (DRAMA)</b>	<b>TEXT</b>	<b>THE INFORMER by BERTOLT BRECHT</b>
	PRONUNCIATION	SYLLABIC STRUCTURE
	GRAMMAR	COMMON ERRORS
	VOCABULARY	COLLOCATIONS
	SPELLING	
	CONVERSATIONS	
	READING PASSAGE	KINNERASANI
	LIFE SKILLS	COPING WITH STRESS AND EMOTIONS

1. Academy

2. Journal 3. Story

4. Hyderabad

5. S. Sairaja Prasad  
2/4/16 6. Journal

T.K.J.

Principal

Govt. Degree College

Luxetipet-504 215, Dist. Mancherial.



## B.Sc. CHEMISTRY CBCS PATTERN IN SEMESTER SYSTEM

### DEPARTMENT OF CHEMISTRY KAKATIYA UNIVERSITY WARANGAL – 506 009

Department of Chemistry, Kakatiya University introduces semester wise Choice Based Credit System (CBCS) at UG level (3 Year course) chemistry as core subject along with Discipline Specific Electives (DSE) in constituent and affiliated colleges of Kakatiya University for the students admitted in the first year from 2016-17 academic year onwards.

Scheme for CBCS, the workload for each paper, distribution of marks, the number of credits and scheme of examination are herewith attached along with model papers.

Internal Assessment examination will be conducted twice in every Semester. Marks will be awarded from the average of the two Internal Assessment Exams in each Semester.

The main examination (theory and practical) will be conducted at the end of the semester.

All the theory papers and practical papers for I, II, III and IV semesters are common to all students. But, one elective (DSE) to be chosen by the student from the available options in V and VI Semesters.

The syllabi of theory and practical papers of I, II, III and IV semesters are enclosed. The syllabi of V and VI semesters will be kept available for the next academic year.

**Prof. Gade Dayakar**  
Chairperson  
Board of Studies in Chemistry  
Kakatiya University - Warangal

Dean

Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

*T.K.J.* Page 1

Principal

Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.



Database Management Systems, Working with a database.

### **Creating Computer programs :**

Overview : What is a computer program. Hardware interaction, Code, machine code, programming languages, Compilers and interpreters, Planning a computer program, How programs solve problems.

### **Programming languages and the programming process :**

Overview : The keys to successful programming. The evolution of programming language. Word wide web development languages. The Systems development life cycle for programming.

## **UNIT - 4 : MS-Word**

**Word Basics :** Starting word, Creating a new document, Opening preexisting document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Formatting Text and Documents : Auto format, Line spacing, Margins, Borders and Shading.

**Headers and Footers :** Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

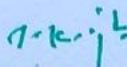
**Tables :** Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting a table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width.

**Graphics :** Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

**Templates :** Template types, using templates, exploring templates, modifying templates.

**Macro :** Macro, Record in a macros, editing macros, running a macro.

**Mail Merge :** Mail Merge concept, Main document, data sources, merging data sources and main document, Overview of word menu options word basic tool bar.

  
Principal

Govt. Degree College  
Luxettipet-504215, Dist. Mancherial.

## UNIT - 5 : Ms-Power Point

**Power Point** : Basis, Terminology, Getting started, Views.

**Creating Presentations** : Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

### *Prescribed Books :*

1. Peter Norton, Introduction to Computers, Sixth Edition, Tata McGraw Hill (2007) (Chapters 1, 2, 3, 4, 5, 6, 7, 10, 11, 12)
2. Ran Mansfield, working in Microsoft Office, Tata McGraw Hill (2008) (Chapters 4 to 9, 11, 12, 24, 25, 28)

### *Reference Books :*

1. Michael Miller, Absolute Beginner's guide to computer Basics, Fourth Edition, Pearson Education (2007)
2. Deborah Morley, Charles S. Parker, understanding computers today and tomorrow, 11<sup>th</sup> edition, Thomson (2007).
3. Ed Bott, woody Leonhard, using Microsoft Office 2007, Pearson Education (2007).

*T.K.J.*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

DEPARTMENT OF POLITICAL SCIENCE  
KAKATIYA UNIVERSITY, WARANGAL  
U.G. POLITICAL SCIENCE (STRUCTURE & SYLLABUS)  
Under Choice Based Credit System (CBCS)  
W.E.F Academic Year 2016-17 Batch

Semester	Course	Course Title:	Credits
----------	--------	---------------	---------

**B.A 1<sup>st</sup> Year (Core Courses)**

Semester – I Course –I Political Theory 5

Semester – II Course –II Political Institutions 5

**B.A II Year (Core Course)**

Semester – III Course –III Indian Constitution and Social Dynamics 5

Semester – IV Course –IV Indian Political Process 5



CHAIRMAN  
Board of Studies in Political Science  
KAKATIYA UNIVERSITY  
WARANGAL-506 009 A.P.

Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Manoherial.

**KAKATIYA UNIVERSITY**  
**DEPARTMENT OF POLITICAL SCIENCE**  
**B.A.POLITICAL SCIENCE**  
**PAPER I**  
**POLITICAL THEORY**  
**(SEMESTER - I)**

**Unit I: Introduction:**

- A. Definition, Scope and Importance of Political Science
- B. Evolution of Political Science

**Unit II: Political Science and other Social Sciences:**

History, Economics and Sociology

**Unit III: Approaches to the Study of Political Science:**

Liberal, Marxist and Behavioural

**Unit IV: Ideologies:**

Individualism, Socialism and Marxism

**Unit V: Theories of Origin of the State:**

Divine, Social Contract and Evolutionary (Historical)

***Books Recommended:***

1. *Principles of Political Science* : Prof. A.C. Kapoor
2. *Grammar of Politics*: Laski H.J.
3. *Substance of Politics* : A. Appadorai
4. *Political Theory* : Ashirvadam
5. *Political Theory* : O P Gauba
6. *Political Ideologies* : Their Origins and Impact, Baradat, Prentice Hall of India

**KAKATIYA UNIVERSITY**  
**DEPARTMENT OF POLITICAL SCIENCE**  
**B.A.POLITICAL SCIENCE**  
**PAPER II**  
**POLITICAL INSTITUTIONS**  
**SEMESTER - II**

**Unit I: State, Nation, Civil Society**

**Unit II: Sovereignty: Monism and Pluralism**

**Unit III: Concepts:**

- A. Law: Sources of Law, Rule of Law
- B. Liberty and Equality — Their Relationship
- C. Theories and kinds of Rights: Human Rights

**Unit IV: Forms of Government:**

- A. Democracy: Direct and Indirect
- B. Unitary and Federal
- C. Parliamentary and Presidential

**Unit V: Organs of Government**

Theory of Separation of Powers (Montesquieu)

- A. Legislature: i) Unicameral and Bi-cameral - Powers and Functions
- B. Executive : i) Powers and Functions
- C. Judiciary i) Powers and Functions  
ii) Independence of Judiciary, Judicial Review

**Books Recommended:**

- 5. *Principles of Political Science* : Prof. A.C. Kapoor
- 6. *Grammar of Politics*: Laski H.J.
- 7. *Substance of Politics* : A. Appadorai
- 8. *Political Theory* : Ashirvadam
- 5. *Political Theory* : O P Gauba
- 7. *Political Ideologies* : Their Origins and Impact, Baradat, Prentice Hall of India

  
Principal  
Govt. Degree College  
Luxertipet-504 215, Dist. Mancherial.

**KAKATIYA UNIVERSITY**  
**DEPARTMENT OF POLITICAL SCIENCE**  
**B.A. POLITICAL SCIENCE**  
**PAPER III**  
**INDIAN CONSTITUTION AND SOCIAL DYNAMICS**  
**SEMESTER III**

**Unit I: Nationalist Movement and Constitutional Development**

- A. Colonial Rule and Indian National Movement
- B. Making of the Indian Constitution
- C. Philosophical Foundations and Salient Features of the Indian Constitution

**Unit II: Fundamental Rights and Directive Principles**

- A. Fundamental Rights and Duties
- B. Directive Principles of State Policy
- C. Relationship between Fundamental Rights and Directive Principles of State Policy

**Unit III: Union Government**

- A. President — Election, Powers and Functions
- B. Parliament: Composition, Powers and Functions
- C. Prime Minister and Council of Ministers
- D. Supreme Court — Composition, Powers and Functions — Judicial Review -  
Judicial Activism

**Unit IV: State Government**

- A. Governor
- B. Chief Minister and Council of Ministers
- C. Legislature
- D. High Court: Composition, Powers and Functions

**Unit V: Social and Political Movements in India**

- A. Farmers Movements
- B. Dalit Movements
- C. Tribal Movements
- D. Environmental Movements
- E. Women's Movements

**Books Recommended:**

1. Politics in India : Rajini Kothari
2. Indian Constitution : M.V. Pylee
3. Indian Government and Politics : S. S. Awasti.
4. Introduction to Constitution of India : D.D. Basu
5. Indian Government and Politics : K.R. Acharya
6. Indian Politics : Contemporary Issues and Concerns, Singh & Saxsena
7. Introduction to Constitution of India, 5<sup>th</sup> ed., Sharma.
8. Indian Polity : V. Lakshmiknath

*T.K. J.L.*

Principal  
Govt. Degree College  
LUXETIpet-504 215, Dist: Manoheral.

**KAKATIYA UNIVERSITY**  
**DEPARTMENT OF POLITICAL SCIENCE**  
**B.A POLITICAL SCIENCE – PAPER IV**  
**INDIAN POLITICAL PROCESS**  
**SEMESTER - IV**

**Unit I : Union — State Relations**

- A. Features of Indian Federal System
- B. Centre— State Relations
- C. Recent Trends in Centre-State Relations

**Unit II : Local Self Government**

- A. Panchayati Raj Institutions: 73<sup>rd</sup> Constitutional Amendment
- B. Urban Local Bodies: 74<sup>th</sup> Constitutional Amendment

**Unit III: Political Process**

- A. Nature of Indian Political Party System
- B. Political Parties—National: INC, BJP, CPI, CPM, BSP, SP, JD(U)
- C. Regional Political Parties: Akali Dal, JMM, AIADMK, TRS, TDP
- D. Pressure Groups
- E. Media

**Unit IV: Electoral Politics**

- A. Election Commission — Composition, Powers and Functions
- B. Voting Behaviour — Influence of Socio-Economic Factors, Electoral Reforms

**Unit V: Statutory Commissions for Protection of Rights**

- A. National Human Rights Commission: Emergence, Evolution and Functioning NHRC
- B. National Commission for Women (NCW)
- C. National SC&ST Commission
- D. National Minorities Commission

**Books Recommended:**

1. Politics in India: Rajini Kothari
2. Indian Constitution : M.V. Pylee
3. Indian Government and Politics : S. S. Awasti.
4. Introduction to Constitution of India : D.D. Basu
5. Indian Government and Politics : K.R. Acharya
6. Indian Politics : Contemporary Issues and Concerns, Singh and Saxsena
7. Introduction to Constitution of India, 5<sup>th</sup> ed., Sharma.
8. Indian Polity : V. Lakshmikanth

**KAKATIYA UNIVERSITY**  
**U.G. POLITICAL SCIENCE (under CBCS)**  
**B.A. Final Year**  
**Semester – VI: Discipline Specific Course (Credits-4)**

**POLITICAL THOUGHT**  
**Western & Indian Political Thought**

**Module I: Idealists**

GWF Hegel-Dialectics and Theory of State  
TH Green-Rights and Political Obligation

**Module II: Marxist Philosophy-I**

Karl Marx: Dialectical and Historical Materialism

**Module III: Marxist Philosophy-II**

Mao ze Dong: On Contradictions, New Democratic Revolution  
Antonio Gramsci: Hegemony and Civil Society

**Module IV: Indian Political Thought-I**

Buddha-Social and Political Ideas, Dhamma and Sangha  
Basava-Social Ideas  
Jyotirao Phule-Critique of Brahmanism, Social Revaluation

**Module V: Indian Nationalist Political Thought-II**

Mohandas Karamchand Gandhi- Ahimsa, Satyagraha.  
Jawaharlal Nehru – Democratic Socialism, Secularism  
Dr. B.R. Ambedkar- Theory of Caste, annihilation of Caste and State Socialism

**Books Recommended:**

1. D. Mackenzie Brown, (1959), Indian Political Thought from Manu to Gandhi, University of California Press, Berkeley and Los Angeles.
2. Georgy Klosko, (ed.), (2011), The Oxford Handbook of The History of Political Philosophy, Oxford University Press, New York.
3. Gregory Claeys, (eds) (2013), Encyclopedia of Modern Political Thought, Sage Publication, New Delhi.
4. M.P. Singh and Himanshu Roy, (eds), (2011), Indian Political Thought: Themes and Thinkers, Pearson, New Delhi.
5. N.D. Arora and S.S. Awasthy, (2007), Political Theory and Political Thought, Har-Anand Publications, New Delhi.
6. S.K. Sarma and Urmila Sharma, (2006), Western Political Thought (from Plato to Burke), Atlantic Publishers, New Delhi.
7. Subrata Mukherjee & Sushila Ramaswamy, (2011), A History of Political Thought: Plato to Marx, PHI Learning Private Limited, New Delhi
8. Thomas Pantham, Kenneth L. Deutschs, (1986), Political Thought in Modern India, Sage Publication, New Delhi.

N.K.J!  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Manoheral.



**KAKATIYA UNIVERSITY**  
**U.G. POLITICAL SCIENCE (Under CBCS)**  
**B.A. Final Year**  
**Semester - VI: Discipline Specific Elective (Credits – 4)**

**Paper-II (A) INTERNATIONAL RELATIONS**  
**International Relations in 19<sup>th</sup> & 20<sup>th</sup> Century-I**

**Module I: International Political Economy:**

Neo Colonialism: North-South Dialogues; South-south Cooperation.  
IBRD, IMF, WTO, and MNCs  
Globalization.

**Module II: International Security:**

Arms Race, Arms Control, Disarmament.  
Issues in Nuclear Politics

**Module III: Emerging Areas in International Relations**

Environment  
Human Rights  
Terrorism

**Module IV: Foreign Policy**

Foreign Policy-Determinants  
India's Foreign Policy: Features.  
Non-Alignment-Relevance

**Module V: India's Bilateral Relations:**

India and Major Powers (U.S.A., Russia)  
India and Neighbouring Countries (China and Pakistan)

***Books Recommended:***

1. Appadorai and Rajan, M.S.(eds.) (1985) India's Foreign Policy and Relations: South Asian Publishers, New Delhi.
2. Art, R. J. and Jervis, R. (eds.) (1999), International Political Enduring: Concepts and Contemporary issues. 5<sup>th</sup> Editions: Longman, New York.
3. Carr E.H. International Relations between the Two World Wars:
4. Ganguly, S.(ed.) (2009) Indian's Foreign Policy: Retrospect and Prospect. Oxford University Press, New Delhi.
5. Goldstein, J. and Pevehouse, J.C. (2009) International Relations. Pearson.
6. Hans J. Morgenthau. Politics Among, Nations, New Delhi.
7. Jackson, R. and Sorenson, G. (2008) Introduction to International Relations: Theories and Approaches,,: Oxford University press, New York.
8. Prakash Chander & Prem Arora, International Relations, 'Cosmos Book hives.
9. Vinay Kumar Malhotra, (2002), International Relations: Anmol Publications Pvt. Limited
10. William, P., Goldstein, D. M. and Shafritz, J. M. (eds.) (1999). Classic Readings of International Relations. Belmont: Wadsworth Publishing co.

*D.K.J.L*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Mancherial.

**KAKATIYA UNIVERSITY**  
**U.G. POLITICAL SCIENCE (Under CBCS)**  
**B.A. Final Year**  
**Semester - VI: Discipline Specific Elective (Credits – 4)**

**Paper-II (B) GOVERNMENT AND POLITICS IN TELANGANA**

**Unit I: Committees and Commissions on Telangana**

- A. Girglani Commission
- B. Rosaiah Committee
- C. Justice Sri Krishna Committee

**Unit II: Role of Political Parties**

- A. National Parties – INC, BJP, CPI, CPM, BSP
- B. Regional Parties – TRS, TDP, MIM, YSRCP
- C. Role of ML Parties: New Democracy, Jana Shakti and Maoist Party

**Unit III: Role of Non Party and Civil Society Actors**

- A. Students JAC
- B. Political JAC and its activities
- C. Other JACs
  - a. Cultural JAC
  - b. Employees JAC
  - c. Lawyers JAC
  - d. Caste and Community JACs.
  - e. Role of Media

**Unit IV: Emergence of Telangana State**

- A. Constitutional Processes
- B. Formation of Telangana State

**Unit V: Party Politics and Elections in Telangana**

- A. Electoral alliances, 2004, 2009 and 2014 and Promises
- B. Formation of TRS Government

***Suggested Readings***

1. Sarojini Regani, Nizam-British Relations
2. Goutham Pingle, The Fall and Rise of Telangana, Hyderabad, 2014.
3. Sundarayya, P. 1972. Telangana Peoples' Struggle and its Lessons, D. P. Sraj Chadha for the communist Party (Marxist), Calcutta.

*T.K.J.*  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancherial.

4. States Reorganization Commission (SRC). 1955. Report, Government of India, Delhi.
5. Krishna, Water Dispute Tribunal. 1976. (Bachawat Tribunal),  
<http://www.irrigation.ap.gov.in/kwdtaward.html>, accessed on January 2014.
6. K.Y.Reddy, Statehood for Telangana essays on Telangana Agitation, History Cultural & Society, and Published by Decan Telangana. 2010.
7. Pandurangam, K. Krishna Rao, V. (1994) By Andhra Pradesh Politics, Telugu Academy, Hyderabad.
8. Ambedkar, B.R. 1955 Thoughts on Linguistic States, <http://www.ambedkar.org>.
9. Veeranna G., (ed) "Social Movements in India: Issues and Challenges, Pragma Publications, Hyderabad, 2016.
10. Ghanashyam Shah: Social Movements and State Sage Publications, New Delhi.
11. Kingshuk Nag., "Battleground Telangana Chronicle of An Agitation" Harper Collins publishers India, New Delhi, 2011.
12. Madabhushi Sridhar, "Emergence of Telangana A.P Reorganisation Act, 2014, Published by Asia Law House, Hyderabad, 2015.
13. B Janardhan Rao Memorial Foundation, "Identity and Struggle Telangana and Adivasis" MRK Publications Hyderabad, 2015.

*N.K.j*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Manoheral.

**KAKATIYA UNIVERSITY**  
**U.G. POLITICAL SCIENCE (Under CBCS)**  
**B.A. Final Year**  
**Semester - VI: Generic Elective Paper-II**

**PUBLIC HEALTH AND HYGIENE**

**UNIT – I Nutrition**

- 1.1 Relationship of Nutrition to Health – Changing concepts: Food habits and Culture
- 1.2 Classification of foods - Carbohydrates, proteins, lipids, vitamins and minerals.
- 1.3 Balanced diet and Malnutrition.
- 1.4 Nutritional deficiencies and disorders- Carbohydrates, proteins, lipids, vitamins and minerals.

**UNIT-II Environment**

- 2.1 Environment and health Impact assessment: concept, steps and applications.
- 2.2 Occupational, Industrial, agricultural and urban Health-Exposure at work place, Urban areas, industrial workers, farmers and agricultural labourers, Health Workers and health disorders and diseases.
- 2.3 Environmental pollution and associated Health hazards; Water borne diseases; Air borne diseases

**UNIT-III Diseases**

- 3.1 Introduction to diseases , types of disease: Communicable and Non-Communicable diseases
- 3.2. Causes, Symptoms, Diagnosis, Treatment and Prevention - Malaria, Filariasis, Measles, Polio, Chicken pox, Rabies, Plague, Leprosy.
- 3.3. Causes, Symptoms, Diagnosis, Treatment and Prevention Tuberculosis and AIDS.
- 3.4. Causes, Symptoms, Diagnosis, Treatment and Prevention of Non communicable Diseases – Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.

**UNIT-IV Hygiene**

- 4.1 Introduction to Social, Industrial and School hygiene
- 4.2 Personal hygiene – objectives and advantages – Health and optimum health, factors affecting health.
- 4.3 Habits – Advantages of good habits and addiction, building of good habits, hygiene Impact on health and economy.

**UNIT-V Health Care**

- 5.1 Health care legislation in India – termination of pregnancy act, Maternity benefit act.
- 5.2 Transplantation of human organs act, Child Labour act, biomedical waste act, ESI act.
- 5.3 WHO Programmes – Government and Voluntary Organizations and their health Services
- 5.4. First Aid and Health awareness, personal health care record maintenance.

**Reference:**

Keshav Swarnkar, Community health – NR Brothers Publishers Indore

*T.K. J*  
Principal  
Govt. Degree College  
Jyethipet-504 215, Dist. Mancherial.

**KAKATIYA UNIVERSITY**  
**U.G. POLITICAL SCIENCE (Under CBCS)**  
**B.A. Final Year**  
**Semester - VI: Personality Development and Soft Skills**  
**Paper-IV (SEC)**

**Max. Marks: 40UE+10IA**

**Unit I: Personality Development:** Personality Development: Meaning- Characteristics – Determinants – Ingredients of pleasing personality. Learning: Meaning – Characteristics – Significance – Principles of learning. Self esteem: Meaning – Characteristics – Significance - Building self esteem.

**Unit II: Self Management:** Attitude Development: Meaning – Characteristics – Significance – Building Positive Attitude. Achievement Motivation: Meaning – Characteristics – Significance – Goal setting for achievement – Strategies of achievement motivation. Emotional Intelligence: Meaning – Characteristics – Significance – Strategies of developing emotional intelligence: Fear, Anger and Anxiety.

***Suggested Readings:***

1. Sarma V S Veluri & Muralidhar D., Personal Empowerment: LOTUS Series - Interactive Learning, CAMEL Limited, 2017.
2. Sarma V S Veluri and Others., Jeevan nipunya: LOTUS Series, (Telugu), CAMEL Limited, 2017.
3. K Alex, Soft Skills, S. Chand & Company, 2013
4. Narula, S S., Personality Development & Communication Skills, Taxman Publications Pvt. Ltd. New Delhi.
5. Arora, A., Communication Skills and Personality Development, Kalyani Publishers, Ludhiana, 2015.

*T.K. J*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Manoheral.

**B.Sc (CBCS) Botany- I year**  
**Semester-I - Paper-I**  
**Microbial Diversity of Lower Plants**

DSC - 1A (4 hrs./week)

Theory Syllabus

Credits- 4  
(60 hours)

**UNIT - I**

1. Brief account of Archaeobacteria, Actinomycetes. (4h)
2. Cyanobacteria: General characters, cell structure, thallus organisation and their significance as biofertilizers with special reference to *Oscillatoria*, *Nostoc* and *Anabaena*. (6h)
3. Lichens: Structure and reproduction; ecological and economic importance. (5h)

**UNIT- II**

4. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro. (7h)
5. Bacteria: Structure, nutrition, reproduction and economic importance. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice. (8h)
6. General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

**UNIT-III**

7. General characters, structure, reproduction and classification of algae (Fritsch) and thallus organization in algae. (3h)
8. Structure and reproduction of the following:  
Chlorophyceae- *Volvox*, *Oedogonium* and *Chara*. (5h)  
Phaeophyceae- *Ectocarpus* (2h)  
Rhodophyceae- *Polysiphonia*. (3h)
9. Economic importance of algae in Agriculture and Industry. (2h)

**UNIT-IV**

10. General characters and classification of fungi (Ainsworth). (3h)
11. Structure and reproduction of the following:  
(a) Mastigomycotina- *Albugo*  
(b) Zygomycotina- *Mucor*  
(c) Ascomycotina- *Saccharomyces* and *Penicillium*.  
(d) Basidiomycotina- *Puccinia*  
(e) Deuteromycotina- *Cercospora*. (10h)
12. Economic importance of fungi in relation to mycorrhizae and mushrooms. General account of mushroom cultivation (2h)

*Soyus*  
*A. C. ei*

*M.*  
*L. m. d.*

T.K.J.L  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Manohar.

**B.Sc (CBCS) Botany-I year  
Semester-I - Paper-I  
Microbial Diversity of Lower Plants**

**Practical Syllabus**

**(45 hours)**

1. Study of viruses and bacteria using electron micrographs (photographs). (3h)
2. Gram staining of Bacteria. (3h)
3. Study of symptoms of plant diseases caused by viruses, bacteria, Mycoplasma and fungi:  
Viruses: Tobacco mosaic  
Bacteria: Angular leaf spot of cotton and Rice tungro.  
Mycoplasma: Little leaf of Brinjal and Leaf curl of papaya (3h)  
Fungi: White rust on Crucifers, Rust on wheat & Tikka disease of Groundnut. (6h)
4. Vegetative and reproductive structures of the following taxa:  
Algae: *Oscillatoria*, *Nostoc*, *Volvox*, *Oedogonium*, *Chara*, *Ectocarpus*  
and *Polysiphonia*. (6 h)  
Fungi: *Albugo*, *Mucor*, *Saccharomyces*, *Penicillium*, *Puccinia* and *Cercospora* (6h)
5. Section cutting of diseased material infected by Fungi and identification of pathogens as per theory syllabus. White rust of Crucifers, Rust on wheat & Tikka disease of Groundnut. (9h)
6. Lichens: Different types of thalli and their external morphology (3 h).
7. Examination of important microbial, fungal and algal products:  
Biofertilizers, protein capsules, antibiotics, mushrooms, Agar-agar etc. (3h)
8. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies). (3h)

*Boyer*  
*A. K. J.*

*ML*

*(M. M.)*

*A. K. J.*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

**B.Sc (CBCS) Botany- I year**  
**Semester-II - Paper-II**  
**Bryophytes, Pteridophytes, Gymnosperms and Paleobotany**

**DSC-1B (4 hrs./week)**

**Theory Syllabus**

**Credits- 4**  
**(60 hours)**

**UNIT-I**

1. Bryophytes: General characters and classification. (3h)
2. Structure, reproduction, life cycle and systematic position of *Marchantia*, *Anthoceros* and *Polytrichum*. (Development stages are not required). (10h)
3. Evolution of Sporophyte in Bryophytes. (2h)

**UNIT-II**

4. Pteridophytes: General characters and classification (Sporne's) (3h)
5. Structure, reproduction, life cycle and systematic position of *Rhynia*, *Lycopodium*, *Equisetum* and *Marsilea*. (10h)
6. Stellar evolution, heterospory and seed habit in Pteridophytes. (2h)

**UNIT-III**

7. Gymnosperms: General characters, structure, reproduction and classification (Sporne's). (4h)
8. Distribution and economic importance of Gymnosperms. (3h)
9. Morphology of vegetative and reproductive parts, systematic position and life cycle of *Pinus* and *Gnetum*. (8 h)

**UNIT-IV.**

10. Palaeobotany: Introduction, Fossils and fossilization ; Importance of fossils. (8 h)
11. Geological time scale; (4 h)
12. Bennettitales: General account. (3 h)

*Pages*  
*A. K. J.*

*BB*

*1/11/20*

*A. K. J.*  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancherial.



B.Sc (CBCS) Botany- I year  
Semester-II - Paper-II  
Bryophytes, Pteridophytes, Gymnosperms and Paleobotany

(45 hours)

Practical Syllabus – 2016

1. Study of Morphology (vegetative and reproductive structures) and anatomy of the following Bryophytes: *Marchantia*, *Anthoceros* and *Polytrichum*. (9 h)
2. Study of Morphology (vegetative and reproductive structures) and anatomy of the following Pteridophytes: *Lycopodium*, *Equisetum* and *Marsilea*. (9 h)
3. Study of Anatomical features of *Lycopodium* stem, *Equisetum* stem and *Marsilea* petiole & rhizome by preparing double stained permanent mounts. (12h)
4. Study of Morphology (vegetative and reproductive structures) of the following taxa:  
Gymnosperms: *Pinus* and *Gnetum*. (6 h)
5. Study of Anatomical features of *Pinus* needle and *Gnetum* stem by preparing double stained permanent mounts. (6h)
6. Fossil forms using permanent slides / photographs: *Rhynia* and *Cycadeoidea*. (3h)

Sayew  
A. S.

B.S.  
L. S.

G.K.J.L.  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

**B.Sc (CBCS) BOTANY- II YEAR**  
**Semester-III - Paper-III**  
**Taxonomy of Angiosperms and Medicinal Botany**

DSC-1C (4 hrs./week)

Theory syllabus

**Credits-4**  
**(60 hours)**

**UNIT - I**

1. Introduction: Principles of plant systematics, Types of classification: Artificial, Natural and Phylogenetic; Systems of classification: Salient features and comparative account of Bentham & Hooker and Engler & Prantle. An introduction to Angiosperm Phylogeny Group (APG). (7h)
- 2.. Current concepts in Angiosperm Taxonomy: Embryology in relation to taxonomy, Cytotaxonomy, Chemotaxonomy and Numerical Taxonomy. (4 h)
- 3.. Nomenclature and Taxonomic resources: An introduction to ICBN, Vienna code - a brief account. Herbarium: Concept, techniques and applications. (4 h)

**UNIT-II**

- 4.. Systematic study and economic importance of plants belonging to the following families:  
Polypetalae : Annonaceae, Capparidaceae, Rutaceae, Fabaceae (Faboideae/papilionoideae, Caesalpinioideae, Mimosoideae), Cucurbitaceae
5. Gamopetalae: Apiaceae, Asteraceae, Asclepiadaceae, Lamiaceae
6. Monochalmydeae: Amaranthaceae, Euphorbiaceae, Monocotyledons: Orchidaceae and Poaceae. (15h)

**UNIT - III**

- 7.. Ethnomedicine: Scope, interdisciplinary nature, distinction of Ethnomedicine from Folklore medicine. (3h)
8. Outlines of Ayurveda, Sidda, Unani and Homeopathic systems of traditional medicine. Role of AYUSH, NMPB, CIMAP and CDRI. (5 h)
- 9.. Plants in primary health care: Common medicinal plants – Tippateega (*Tinospora cordifolia*), tulasi (*Ocimum sanctum*), pippallu (*Piper longum*), Karakaya (*Terminalia chebula*), Kalabanda (*Aloe vera*), Turmeric (*Curcuma longa*). Evaluation of crude drugs. (7h)

**UNIT-IV**

10. Traditional medicine vs Modern medicine: Study of selected plant examples used in traditional medicine as resource (active principles, structure, usage and pharmacological action of modern medicine: Aswagandha (*Withania somnifera*), Sarpagandha (*Rauwolfia serpentina*), Nela usiri (*Phyllanthus amarus*), Amla (*Phyllanthus emblica*) and Brahmi (*Bacopa monnieri*). (8h)
11. Pharmacognosy: Introduction and scope. Adulteration of plant crude drugs and methods of identification - some examples. Indian Pharmacopoeia. (4h)
12. Plant crude drugs: Types, methods of collection, processing and storage practices. (3h)

*Soyles*  
*A. V. V.*

*B. S.*  
*(M. W.)*

*T. K. J.*  
Principal  
Govt. Degree College  
Jettipet-504 215, Dist. Mancherial.

**B.Sc (CBCS) BOTANY- II YEAR**  
**Semester-III - Paper-III**  
**Taxonomy of Angiosperms and Medicinal Botany**

**Practical syllabus**

(45 hours)

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus  
(Minimum of one plant representative for each family) (24h)
2. Demonstration of herbarium techniques. (3 h)
3. Identification, medicinal value & active principle present in the following plants : Tulasi (*Ocimum sanctum* ), Karakaya (*Terminalia chebula*), Kalabanda (*Aloe vera*). (6 h)
4. Ethnomedicinal value/practice of the following plants :  
Aswagandha (*Withania somnifera*), Sarpagandha (*Rauwolfia serpentina*), Amla (*Phyllanthus emblica*) and  
Brahmi (*Bacopa monnieri*). (6h)
5. Pharmacognosy:  
Powder analysis : Pippalu (*Piper longam*), Nela usiri (*Phyllanthus niruri*),  
Study of Organoleptic (sectional study) of the following:  
Tippateega (*Tinospora cordifolia*) and Turmeric (*Curcuma longa*). (6h)
6. Candidate have to submit at least 30 herbarium sheets

*Praveen*  
*A. K. S.*

*B.S.*  
*(in a)*

*T.K. J.L.*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

**B.Sc (CBCS) BOTANY- II YEAR**  
**Semester-III - Paper-III**  
**Taxonomy of Angiosperms and Medicinal Botany**

**Practical Model Paper**

**Time: 2 1/2 hrs**

**Max. Marks: 25**

- |   |    |
|---|----|
| 1. Technical description of the given plant twig ' A '                        | 9M |
| 2. Identify the given material ' B ' & write its medicinal properties         | 3M |
| 3. Identify the specimen ' C ' & write organoleptic evaluation                | 3M |
| 4. Identify the given material D ' & discuss the ethno medicinal value of it. | 3M |
| 5. Identify the given material ' E ' . Write the active principle and uses    | 3M |
| 6. Herbarium  | 2M |
| 7. Record   | 2M |

*Sageev*  
*Abu*  
*Bor*  
*Lum*

*T.K.J*  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

**B.SC (CBCS) BOTANY- II YEAR**  
**Semester-IV- Paper IV**  
**Plant Anatomy, Embryology and Palynology**

DSC-1D	(4 hrs./week)	Theory syllabus	Credits-4 (60 hours)
<b>UNIT - I:</b>			
1.	Meristems: Types, histological organization of shoot and root apices and theories.		(3h)
2.	Tissues and Tissue Systems: Simple, complex and special tissues.		(6 h)
3.	Leaf: Ontogeny, diversity of internal structure; stomata and epidermal outgrowths.		(6 h)
<b>UNIT-II</b>			
4.	Stem and root anatomy: Vascular cambium - Formation and function.		(3h)
5.	Anomalous secondary growth of Stem - <i>Achyranthes</i> , <i>Boerhaavia</i> , <i>Bignonia</i> , <i>Dracaena</i> ; Root- <i>Beta vulgaris</i>		(5h)
6.	Wood structure: General account. Study of local timbers – Teak ( <i>Tectona grandis</i> ), Rosewood, ( <i>Dalbergia latifolia</i> ), Red sanders, ( <i>Pterocarpus santalinus</i> ) Nallamaddi ( <i>Terminalia tomentosa</i> ) and Neem ( <i>Azadirachta indica</i> ).		(7h)
<b>UNIT - III</b>			
7.	Introduction: History and importance of Embryology.		(2h)
8.	Anther structure, Microsporogenesis and development of male gametophyte.		(6h)
9.	Ovule structure and types; Megasporogenesis; types and development of female gametophyte.		(7h)
<b>UNIT-IV</b>			
10.	Pollination - Types; Pollen - pistil interaction. Fertilization.		(4h)
11.	Endosperm - Development and types. Embryo - development and types; Polyembryony and Apomixis - an outline.		(5h)
12.	Palynology- Pollen morphology, NPC system and application of Palynology.		(6h)

*Soyles*  
*A...*

*Be*

*(L...)*

*T.K.J.*  
Principal  
Govt. Degree College  
Wetipet-504 215, Dist. Manoheral.

**B.SC (CBCS) BOTANY- II YEAR**  
**Semester-IV- Paper IV**  
**Plant Anatomy, Embryology and Palynology**

**Practical syllabus**

(45 hours)

**Suggested Laboratory Exercises:**

1. Demonstration of double staining technique. (3 h)
2. Tissue organization in root and shoot apices using permanent slides (3 h)
3. Preparation of double stained Permanent slides  
Primary structure: Root - *Cicer, Canna*; Stem - *Tridax, Sorghum* (6 h)  
Secondary structure: Root - *Tridax* sp.; Stem - *Pongamia*
- Anomalous secondary structure: Examples as given in theory syllabus. (6 h)
4. Stomatal types using epidermal peels. (3 h)
5. Microscopic study of wood in T.S., T.L.S. and R.L.S. (6 h)
6. Structure of anther and microsporogenesis using permanent slides. (3 h)
7. Structure of pollen grains using whole mounts - *Hibiscus, Acacia* and Grass). (3 h)
8. Pollen viability test using Evans Blue - *Hibiscus* (3 h)
9. Study of ovule types and developmental stages of embryosac. (3 h)
10. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot embryos using permanent slides. (3 h)
11. Isolation and mounting of embryo (using *Cymopsis / Senna / Crotalaria*) (3 h)

*Principals*  
*A. K. S.*

*B.S.*

*(L.M.)*

*7.12.15*  
Principal  
Govt. Degree College  
Luxetipet-504 215, Dist. Mancherial.

**B.Sc Botany- III Year  
Semester-V - Paper-V  
Cell Biology and Genetics**

DSC-1E (3 hrs./week)

Theory Syllabus

**Credits-3  
45 hours**

**Unit - I:**

1. Plant cell envelops: Ultra structure of cell wall, molecular organization of cell membranes.(4h)
2. Nucleus: Ultra structure, Nucleic acids - Structure of DNA, types and functions of RNA. (4 h)
3. Chromosomes: Morphology, organization of DNA in a chromosome, Euchromatin and Heterochromatin, Karyotype. DNA Replication. Special types of chromosomes: Lampbrush Polytene and B - chromosomes. (7h)
4. Extra nuclear genome: Mitochondrial and plastid DNA, plasmids. (3 h)

**Unit - II:**

5. Cell division: Cell and its regulation; mitosis, meiosis and their significance (3h)
6. Mendelism: Laws of inheritance. Genetic interactions - Epistasis, Complementary, Supplementary and inhibitory genes. (5h)
7. Linkage: A brief account and theories of Linkage. Crossing over: Mechanism and theories of crossing over. (4 h)
8. Genetic maps: Construction of genetic maps with Two point and Three point test cross data. (3h)

**Unit - III:**

9. Mutations: Chromosomal aberrations - structural and numerical changes; Gene mutations, Transposable elements. (3 h)
10. Gene Organization- Structure of gene, Genetic code, Method of Replication of DNA in Eukaryotes & Prokaryotes (3h)
11. Mechanism of transcription in Prokaryotes and Eukaryotes, translation (4h)
12. Regulation of gene expression in prokaryotes (Lac and Trp. Operons ). (2h)

*Boyer*  
*A...*

*Boyer*

*Boyer*

*D.K.J.L*  
**Principal**  
**Govt. Degree College**  
Luxettipet-504 215, Dist: Mancherial.

**B.Sc (CBCS) Botany- III Year  
Semester-V - Paper-V  
Cell Biology and Genetics**

**Practical Syllabus**

**(45 hours)**

1. Demonstration of cytochemical methods: Fixation of plant material and nuclear staining for mitotic and meiotic studies. (6 h)
2. Study of various stages of mitosis using cytological preparation of Onion root tips. (6 h)
3. Study of various stages of meiosis using cytological preparation of Onion flower buds. (3 h)
5. Solving genetic problems related to monohybrid, dihybrid ratio incomplete dominance and interaction of genes (minimum of six problems in each topic). (12h)
6. Construction of linkage maps; two and three point test cross. (6 h)
7. Study of ultra structure of cell organelles using photographers. (6h)
8. Study of Special types of Chromosomes (6h)

*Engel*  
*A. K.*

*AB.*

*(L. M.)*

*T. K. J.*

Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.



**B.Sc (CBCS) Botany: III Year  
Semester-VI - Paper-VIII  
Plant Physiology**

**DSC-1F (3hrs./week)**

**Theory Syllabus**

**Credits-3  
(45 hours)**

**UNIT - I**

1. Water Relations: Importance of water to plant life, physical properties of water, diffusion, imbibition, osmosis; water, osmotic and pressure potentials; absorption, transport of water, ascent of sap; transpiration; Stomatal structure and movements. (7h)
2. Mineral Nutrition: Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency. (3h)
3. Stress physiology: concept and plant responses to water, salt and temperature stresses (2h)
4. Translocation of organic substances: Mechanism of phloem transport; source-sink relationships. (2h)

**UNIT- II**

5. Enzymes: Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action. (4h)
6. Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; Factors effecting Photosynthesis, photophosphorylation. (4h)
7. Carbon assimilation pathways: C<sub>3</sub>, C<sub>4</sub> and CAM. (4h)
8. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway. (6h)

**UNIT - III**

9. Nitrogen Metabolism: Biological nitrogen fixation, nitrate reduction, ammonia assimilation, (GS-GOGAT, transamination) (4h)
10. Lipid Metabolism: Structure and function of lipids. (3h)
11. Growth and Development: Physiological effects of phytohormones—Auxins, gibberellins, cytokinins, ABA, ethylene and Brassinosteroids (3h)
12. Physiology of flowering and photoperiodism. Role of Phytochrome in flowering. (3h)

*Praveen  
A. S.*

*Pr*

*(u m)*

*T.K.J.*

**Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancherial.**

**B.Sc (CBCS) Botany: III Year  
Semester-VI - Paper-VIII  
Plant Physiology**

**Practical Syllabus**

**(45 hours)**

1. Determination of osmotic potential of vacuolar sap by Plasmolytic method using leaves of *Rheodiscolor / Tradescantia*. (6h)
2. Determination of rate of transpiration using Cobalt chloride method (3h)
3. Determination of stomatal frequency using leaf epidermal peelings / impressions (6h)
4. Determination of catalase activity using potato tubers by titration method (6h)
5. Separation of chloroplast pigments using paper chromatography technique (12h)
6. Estimation of protein by Biurette method (6h)
7. Mineral deficiency- Detail study of Micronutrients and Macro nutrients (3h)
8. Identification of C<sub>3</sub>, C<sub>4</sub> and CAM plants (3h)

Boyer  
A. K.

Boyer

(in a)

7.12.15

Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancherial.

U.G. ECONOMICS SYLLABUS (Under CBCS)  
**B.A. I - YEAR**  
(w.e.f. Academic Year 2016-17 Batch)  
Semester – I - Discipline Specific Course (Credits – 5)

**Course – I : MICRO ECONOMICS – I**

Unit I:

Introduction:

Nature, Definition and scope of Economics – Concepts of wealth, welfare, scarcity and growth – Macro Analysis: Static and Dynamic, Normative and Positive – Inductive and Deductive Analysis- Partial and General Equilibrium – Choice as an economic problem.

Unit II:

Consumer Behavior:

Utility Analysis – Cardinal and Ordinal approaches – Law of Diminishing Marginal Utility – Law of Equi-marginal utility, indifference curve, properties of indifference curves – Price (Budget) line – Equilibrium of the Consumer with the help of indifference curves – Price, Income and Substitution effect- Consumer Surplus.

Unit III:

Demand Analysis:

Concept of Demand- Law of Demand- Determinants of demand – Types of Demand – Demand Function – Elasticity of Demand – Price, Income and Cross elasticity of demand – Derivation of Demand Curve - Measures of Elasticity of Demand. Demand Forecast- Meaning- Factors influencing demand forecast.

Unit IV:

Supply Analysis:

Concept of Supply – Law of Supply – Determinants of Supply – Supply Function – Elasticity of Supply – Derivation of Supply Curve – Supply Curve in Perfect and Imperfect Markets – Market Equilibrium.

Unit V:

Production Analysis:

Concept of Production – Production Function – Linear and Non-linear Production Function – Isoquant – Law of Variable Proportion – Isocost Curve – Producer Equilibrium- Law of Returns to Scale – Expansion Path – Internal and External Economies.

References:

- |                      |   |
|----------------------|---|
| Reynold, L.G.        | : Micro Economic Analysis and Policy, University Book Stall.              |
| Koutsoyiannis, A     | : Modern Micro Economic Theory - Macmillian Co, New York.                 |
| Baumol, J, William   | : Economic Theory and Operations analysis, Prentice Hall India            |
| JEA                  | : Readings in the theory of Price. Creyeant and Cohen: Theory of the firm |
| Ahuja, H.L.          | : Advanced Economic Theory: Micro Economic Analysis, S. Chand & Co.,      |
| Stigler, G.J         | : The Price Theory OUP, Henderson.  |
| Handerson & Quandt   | : Micro Economic Theory and Applications.                                 |
| Hal R Varian,        | : Micro Economic Analysis , W W Norton and Comp, Halderson and            |
| Layard and Walters   | : Micro Economic Theory, McGraw Hill                                      |
| Whinston & J.R.Green | : Micro Economic Theory.  |

  
**Principal**  
**Govt. Degree College**  
Luxettipet- 504 215, Dist. Mancheral.

U.G. ECONOMICS SYLLABUS (Under CBCS)  
**B.A. I- YEAR**  
Semester – II : Discipline Specific Course ( Credits – 5)

**Course – II : MICRO ECONOMICS - II**

Unit I:

Cost and Revenue Analysis:

Concepts of Costs and Revenue and their interrelation – Cost Analysis: Total, Average and Marginal Cost Curves in Short Run and Long Run – Revenue Analysis: Total, Average and Marginal Revenue Curves – Relationship among Average and Marginal Revenue – Equilibrium of the firm; Break-even Analysis.

Unit II:

Market Structure Analysis – I:

Concept of Firm, Industry and Market- Classification of Markets – Perfect Competition: Characteristics- Price Determination - Equilibrium of the Firm and Industry during the Short-Run and Long-Run – Monopoly: Concept, Characteristics – Equilibrium of the Firm – Price Discrimination.

Unit III:

Market Structure Analysis – II:

Monopolistic Competition – Concept, Characteristics – Equilibrium of the Firm – Selling Costs – Duopoly: Concept and Characteristics- Cournot Model – Oligopoly: Concept and Characteristics – Kinky Demand Curve – Price Rigidity.

Unit IV:

Marginal Productivity Theory – I:

Concept of Marginal Productivity – Marginal Physical Product – Marginal Revenue Product – Marginal Value of Product – Factor Pricing: Rent: Ricardian Theory of Rent - Quasi Rent Theory – Modern Theory of Rent.

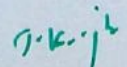
Unit V:

Marginal Productivity Theory – II:

Wage – Wage Determination – Collective Bargaining – Minimum Wage – Capital - Determination of interest: Classical and Neo-Classical Theory of Interest – Profit: Theory of Uncertainty – Risk Theory – Innovative Theory.

References:

- |                      |  |
|----------------------|--|
| Reynold, L.G.        | : Micro Economic Analysis and Policy, University Book Stall.             |
| Koutsoyiannis, A     | : Modern Micro Economic Theory - Macmillian Co, New York.                |
| Baumol, J, William   | : Economic Theory and Operations analysis, Prentice Hall India           |
| JEA                  | : Readings in the theory of Price. Creyent and Cohen: Theory of the firm |
| Ahuja, H.L.          | : Advanced Economic Theory: Micro Economic Analysis, S. Chand & Co.,     |
| Stigler,G.J          | : The Price Theory OUP, Henderson.                                       |
| Handerson & Quandt   | : Micro Economic Theory and Applications.                                |
| Hal R Varian,        | : Micro Economic Analysis , W W Norton and Comp, Halderson and           |
| Layard and Walters   | : Micro Economic Theory, McGraw Hill                                     |
| Whinston & J.R.Green | : Micro Economic Theory.   |
| Weintraub. E.R       | : General Equilibrium Theory, Macmillan, London Hildenbrand and          |
| Kirman, A.P.(1976)   | : Introduction to Equilibrium Analysis.                                  |

  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist: Mancherial.

U.G. ECONOMICS SYLLABUS ( Under CBCS)

**B.A. II-YEAR**

Semester –III : Discipline Specific Course ( Credits – 5)

**Course – IV : MACRO ECONOMICS**

Unit I:

Introduction:

Meaning, Nature, scope and importance of Macro Economics – Concept of circular flow of Income – National Income: Concept and Components – GNP and NNP, GDP, Personal Income (PI), Disposal Income, Per Capita Income (PCI), Real National Income (RNI) – Methods of Estimation – Importance of and difficulties in the estimation of National Income.

Unit II:

Theory of Output and Employment:

Classical Theory of Employment – Say's Law of Markets – Wage-cut Policy – Keynesian Theory of Employment : Effective Demand, Aggregate Demand, Aggregate Supply – Consumption Function – APC, MPC, Factors influencing consumption pattern – Investment Function: MEC and Rate of Interest – Concept of Multiplier and Accelerator.

Unit III:

Money and Theories of Money:

Meaning, Functions and Classification – Money Supply – Measures of Money Supply – M1, M2, M3, M4, Theories of Money – Fishers' Quantity Theory of Money – Cambridge Approach (Marshall, Pigou, Robertson) – Keynes Theory of Money.

Unit IV:

Trade Cycles and Inflation:

Trade Cycles – Meaning, Causes and Consequences – Stages of Trade Cycle – Inflation: Definition – Types of Inflation – Causes and Effects of Inflation – Measures to control Inflation – Concept of Deflation.

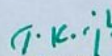
Unit V:

Banking and Stock Market:

Commercial Bank – Functions – Process of Credit Creation – Concept of Non-banking Finance Companies (NBFCs) – RBI: Concept – Functions – Credit Control Measures – Concepts of Shares and Debentures - Stock Market – Functions and Importance of Stock Market- Primary and Secondary Markets – SEBI.

References:

1. Gardener Ackely, (1978) : Macro Economics - Theory & Policy
2. Branson, W.A (1989) : Macro Economic Theory and Policy
3. Jha, R (1991) : Contemporary Macro Economic Theory and Policy
4. Jhingan, M.L.(1999) : Macro Economics
5. Surrey MJC, (1976) : Macro Economic Theorems, Oxford
6. Rao, V.K.R.V (1983) : India's National Income, 1950 to 1980, New Delhi.
7. Keynes, J.M (1936) : General Theory of Employment, Interest and Money
8. Gupta, S.B. : Monetary Theory.
9. Edward Shepero : Macro Economic Analysis, Galgothi Publication, New Delhi.
10. David Laidler : Demand for money, Mac Millian
11. Hicks, Mukerjee & Ghosh Social Frame work of Indian Economy.

  
 Prindpal  
 Govt. Degree College  
 Luxettipet-504 215, Dist. Mancherial.

## **THIRD YEAR**

### **PAPER - III INDIAN ECONOMIC DEVELOPMENT & A.P. ECONOMY**

#### **NOTE:**

In this paper organizing a field study, or project work or assignment with Viva-Voce with a weightage of 20 marks is recommended. The theory paper should consist of 80 marks only.

#### **Module - 1 : CONCEPTS OF DEVELOPMENT**

Meaning of Economic growth and development - Measures of Economic Development - GNP, PCI, PQLI and HDI. Factors influencing Economic development - Sustainable development - Balanced and unbalanced growth - Choice of Techniques Labour intensive and capital intensive methods.

#### **Module - 2 : STRUCTURE OF THE INDIAN ECONOMY**

Demographic features - Size and growth of the population - Age and sex composition - Rural and Urban population - Occupational distribution - Population policy. National income in India - Trends and Composition - Poverty, Inequalities and unemployment - Causes and consequences. Current Five Year Plan - Objectives, Mobilization and Allocation of Resources - New Economic Reforms - Liberalization, Privatization and Globalization in India - Inclusive Growth.

#### **Module - 3 : INDIAN AGRICULTURE**

Nature and importance; Trends in agricultural Production and Productivity; factors determining productivity. Rural Credit - Micro Finance and Self Help Groups (SHGs). Agricultural price policy, Crop insurance, Agricultural Infrastructure and food security.

#### **Module - 4 : INDIAN INDUSTRY AND SERVICES**

Structure and Growth of Indian Industry - Industrial policies of 1956 and 1991. Growth and problems of Small Scale Industry. Foreign Exchange Management Act (FEMA); Disinvestment policy in India - Foreign Direct Investment - Growing importance of Services Sector in India - Banking, Insurance, Information Technology, Education and Health.

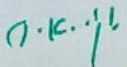
82

#### **Module - 5 : ANDHRA PRADESH STATE ECONOMY**

GSDP - Sectoral Contribution and Trends; Human Resources - Population Trends, Agricultural Sector - Land use and Cropping pattern; Industrial Sector - Small Scale industries, Investment and employment in industrial sector, SEZs; Service Sector - Growth of income and employment in the service sector, Information Technology (IT).

#### **References :**

1. Dhingra, I.C. - "Indian Economy", Sultan Chand, 2007.
2. Ruddar Dutt and K.P.M. Sundaram - "Indian Economy", S. Chand & Co., 2008.
3. G.M. Meier - "Leading Issues in Economic Development", Oxford University Press, New York, 3/e.
4. M.P. Todaro - "Economic Development", Longman, London, 6/e, 1996.
5. Reserve Bank of India - Handbook of Statistics on Indian Economy (Latest).
6. S.K. Misra & V.K. Puri - "Indian Economy", Himalayan Publishing House, 2006.
7. R.S. Rao, V. Hanumantha Rao & N. Venu Gopal (Ed.) - Fifty Years of

  
Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancherial.

**PAPER - IV (A)**  
**OPTIONAL PAPER**

**PUBLIC FINANCE AND INTERNATIONAL  
ECONOMICS**

**Module-1 : Public Finance and Taxation**

In this paper organizing a field study, or project work or assignment or Viva-Voce with a weightage of 20 marks is recommended. The theory paper should consist of 80 marks only.

**Module - 1 : Concepts of Development**

Meaning and scope of public finance, Distinction between private and public finance; Public goods vs private goods; Role of the state in mixed economy; Source of public revenue, taxation, meaning direct and indirect taxes and their merits and demerits; Canons of taxation; impact, shifting and incidence of taxation; Effects of taxation; Characteristics of good tax system.

**Module - 2 : Public Expenditure and Public Debt**

Meaning and classification of public expenditure; Canons and effects of public expenditure; Public debt-Sources of public debt; Effects of public debt; Methods of debt-redemption; Growth of India's public debt; Concepts of budget deficit.

**Module - 3 : Theories of International Trade**

Inter-regional and International trade; Absolute advantage; Comparative advantage and Heckscher-Ohlin. Trade as an engine of economic growth. Terms of trade.

**Module - 4 : Tariffs and Balance of Payments**

Tariffs and quotas, Concept of optimum tariff. Balance of Trade and Balance of Payments, Dis-equilibrium in Balance of Payments. Causes and corrective measures.

**Module - 5 : Foreign Trade in India**

Composition and Direction of Foreign Trade, Causes and effects of persistent deficit in Balance of Payments. Need for and rationale of trade reforms. Export Promotion Policy, Exim Policy, Exim Bank, Foreign Direct Investment in India, IMF, IBRD, WTO and Liberalisation, Privatisation, Globalisation Programmes in developing countries.

**B.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 – Preparation – 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.

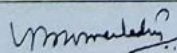
**S1-I-3. General Principles of Inorganic qualitative analysis**

**6 h**

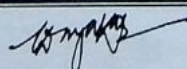
Anion analysis: Theory of sodium carbonate extract, classification and reactions of anions- $CO_3^{2-}$ ,  $Cl^-$ ,  $Br^-$ ,  $SO_4^{2-}$ ,  $PO_4^{3-}$ ,  $BO_3^{3-}$ ,  $CH_3COO^-$ ,  $NO_3^-$ .

Cation Analysis: Principles involved - Solubility product, common ion effect, general discussion for the separation and identification of group I individual cations ( $Hg_2^{2+}$ ,  $Ag^+$ ,  $Pb^{2+}$ ) 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 ( $Hg^{2+}$ ,  $Pb^{2+}$ ,  $Bi^{3+}$ ,  $Cd^{2+}$ ,  $Sb^{2+}$ ), 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 ( $Mg^{2+}$ ,  $NH_4^+$ ).

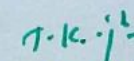


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 3



**Principal**

**Govt. Degree College**  
**Luxettipet -504 215**



## 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.

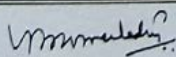
**Alkenes** - Preparation of alkenes (with mechanism) (a) by dehydration of alcohols (b) dehydrohalogenation of alkyl halides (c) by dehalogenation of 1,2dihalides, Zaitsev's rule. Properties: Addition of Hydrogen – heat of hydrogenation and stability of alkenes. trans-addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H<sub>2</sub>O, HOX, H<sub>2</sub>SO<sub>4</sub> with mechanism and addition of HBr in the presence of peroxide (anti – Markonikov's addition). Oxidation (cis – additions) – hydroxylation by KMnO<sub>4</sub>, OsO<sub>4</sub>, 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<sub>2</sub>, HX, H<sub>2</sub>O (tautomerism), Oxidation (formation of enediol, 1,2diones and carboxylic acids) and reduction (Metal-ammonia reduction, catalytic hydrogenation)

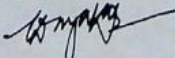
### S1-O-3: Alicyclic Hydrocarbons

3 h

Nomenclature, preparation by Freund's method, Dieckmann, 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 of cyclopentane, cyclohexane.



Dean

  
Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 4

  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

**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  $\psi$  and  $\psi^2$ , 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<sub>2</sub>. 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.

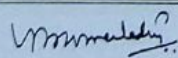
**Unit – IV (General Chemistry)****15 h (1 hr/week)****S1-G-1 Chemical Bonding****11 h**

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.

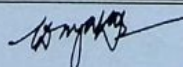
**Molecular orbital theory:** Shapes and sign convention of atomic orbitals. Modes of overlapping. Concept of  $\sigma$  and  $\pi$  bonds. Criteria for orbital overlap. LCAO concept. Types of molecular orbitals- bonding, antibonding and non bonding. MOED of homonuclear diatomics - H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, O<sub>2</sub><sup>-</sup>, O<sub>2</sub><sup>2-</sup>, F<sub>2</sub> (unhybridized diagrams only) and heteronuclear diatomics CO, CN<sup>-</sup>, NO, NO<sup>+</sup> 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, subtraction, division and multiplication (with respect to determinate errors).

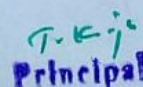


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 5

Govt. Degree College  
Luxettipet -504 215

## References:

### Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3<sup>rd</sup>edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L.Gaus 3<sup>rd</sup>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 4<sup>th</sup>edn.
6. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
7. Inorganic Chemistry by Shriver and Atkins 3<sup>rd</sup>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, SunithaDhingra and Adarsh Gulati

### Unit- II

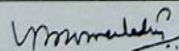
1. Text book of organic chemistry by Morrison and Boyd.
2. Text book of organic chemistry by Graham Solomons.
3. Text book of organic chemistry by Bruice Yuranis Powla.
4. Text book of organic chemistry by Soni.
5. General Organic chemistry by Sachin Kumar Ghosh.
6. Text book of organic chemistry by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

### Unit III

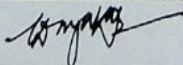
1. Principles of physical chemistry by Prutton and Marron.
2. Text Book of Physical Chemistry by Soni and Dharmahara..
3. Text Book of Physical Chemistry by Puri and Sharma.
4. Text Book of Physical Chemistry by K. L. Kapoor.
5. Physical Chemistry through problems by S.K. Dogra.
6. Text Book of Physical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

### Unit IV

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3<sup>rd</sup>edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L.Gaus 3<sup>rd</sup>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

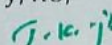


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 6

  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Mancherial.

Laboratory Course

45h (3 h / week)

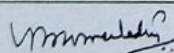
Paper I Qualitative Analysis - I

*I. Preparations:*

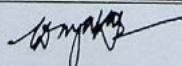
1. Tetrammine copper (II) sulphate,
2. Potash alum  $KAl(SO_4)_2 \cdot 12H_2O$ ,
3. Bis (dimethylglyoximate) nickel(II)

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

---

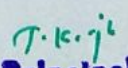


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 7

  
**Principal**  
Govt. Degree College  
Luxettipet - 504 214

**B.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:  $\text{HNO}_2$  (reaction with  $\text{FeSO}_4$ ,  $\text{KMnO}_4$ ,  $\text{K}_2\text{Cr}_2\text{O}_7$ ),  $\text{HNO}_3$  (reaction with  $\text{H}_2\text{S}$ , Cu),  $\text{HNO}_4$  (reaction with KBr, Aniline),  $\text{H}_2\text{N}_2\text{O}_2$  (reaction with  $\text{KMnO}_4$ ). Redox properties of oxyacids of Potassium:  $\text{H}_3\text{PO}_2$  (reaction with  $\text{HgCl}_2$ ),  $\text{H}_3\text{PO}_3$  (reaction with  $\text{AgNO}_3$ ,  $\text{CuSO}_4$ ). Redox properties of oxyacids of Sulphur:  $\text{H}_2\text{SO}_3$  (reaction with  $\text{KMnO}_4$ ,  $\text{K}_2\text{Cr}_2\text{O}_7$ ),  $\text{H}_2\text{SO}_4$  (reaction with Zn, Fe, Cu),  $\text{H}_2\text{S}_2\text{O}_3$  (reaction with Cu, Au),  $\text{H}_2\text{SO}_5$  (reaction with KI,  $\text{FeSO}_4$ ),  $\text{H}_2\text{S}_2\text{O}_8$  (reaction with  $\text{FeSO}_4$ , KI)

**Interhalogens-** classification- general preparation- structures of  $\text{AB}$ ,  $\text{AB}_3$ ,  $\text{AB}_5$  and  $\text{AB}_7$  type and reactivity. Poly halides- definition and structure of  $\text{ICl}_2^-$ ,  $\text{ICl}_4^-$  and  $\text{I}_3^-$ . 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. Clathrate 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 SRP Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu triads. 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)**

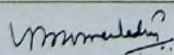
**S2-O-1: Aromatic Hydrocarbons**

**7h**

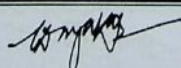
Concept of aromaticity – definition, Huckel's rule – application to Benzenoids and Non – Benzenoids (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation).

Preparations: 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.

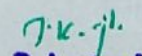


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 8

  
Principal

Govt. Degree College  
Luxettipet -504 215

**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  $\text{RMgX}$ , Nucleophilic substitution reactions – classification into  $\text{S}_\text{N}^1$  and  $\text{S}_\text{N}^2$ . Mechanism and energy profile diagrams of  $\text{S}_\text{N}^1$  and  $\text{S}_\text{N}^2$  reactions. Stereochemistry of  $\text{S}_\text{N}^2$  (Walden Inversion) 2-bromobutane,  $\text{S}_\text{N}^1$  (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**

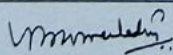
Liquid - liquid mixtures, ideal liquid mixtures, Raoult's and Henry's laws. Non ideal systems. Azeotropes  $\text{HCl-H}_2\text{O}$  and  $\text{C}_2\text{H}_5\text{OH} - \text{H}_2\text{O}$  systems. Fractional distillation. Partially miscible liquids- Phenol – Water, Trimethyl amine – Water and Nicotine – Water systems. Lower upper consolute temperatures. Effect of impurity on consolute temperature. Immiscible liquids and steam 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**

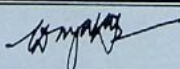
Dilute Solutions, Colligative Properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis - laws of osmotic pressure, its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Derivation 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'thoff factor, degree of dissociation and association of solutes.

**S2-P-3: Solid state Chemistry****5 h**

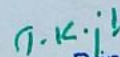
Laws of Crystallography – (i) Law of Constancy of interfacial angles (ii) Law of Symmetry, Symmetry elements in crystals (iii) Law of rationality of indices. Definition of space lattice, unit cell. Bravais Lattices and Seven Crystal systems (a brief review). X-ray diffraction by crystals; Derivation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



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,



Principal Page 9

Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

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  $\text{Ni}^{2+}$

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

**5 h**

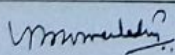
Valence bond theory, Explanation of metallic properties and its limitations, Free electron theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors n-type and p-type, extrinsic & intrinsic semiconductors, and insulators.

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

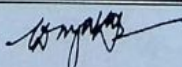
**5 h**

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).



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 10

  
Principal

Govt. Degree College  
Luxettipet -504 215

## References

### Unit I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3<sup>rd</sup>edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L.Gaus 3<sup>rd</sup>edn
4. Wiley Publishers 2001.Chem
5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
6. Inorganic Chemistry by Shriver and Atkins 3<sup>rd</sup>edn Oxford Press 1999.
7. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4<sup>th</sup>edn.
8. Textbook of inorganic chemistry by R Gopalan

### Unit II

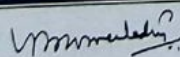
1. Text book of organic chemistry by Morrison and Boyd.
2. Text book of organic chemistry by Graham Solomons.
3. Text book of organic chemistry by Bruce Yuranis Powla.
4. Text book of organic chemistry by Soni.
5. General Organic chemistry by Sachinkumar Ghosh.
6. Text book of organic chemistry by C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

### Unit III

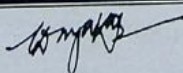
1. Principles of physical chemistry by Prutton and Marron.
2. Text Book of Physical Chemistry by Soni and Dharmahara.
3. Text Book of Physical Chemistry by Puri and Sharma
4. Text Book of Physical Chemistry by K. L. Kapoor
5. Physical Chemistry through problems by S.K. Dogra.
6. Elements of Physical Chemistry by Lewis and Glasstone.
7. Material science by Kakani&Kakani

### Unit IV

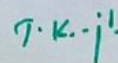
1. Vogel's Text Book of Quantitative Analysis by G.H.Jeffery, J.Bassett, J.Mendham and R.C. Denney 5<sup>th</sup>edn Addison Wesley Longman Inc. 1999.
2. Quantitative Analysis by Day and Underwood Prentice Hall (India) VI Edn..
3. Nano: The Essentials by T. Pradeep, McGraw-Hill Education.
4. Chemistry 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, SunithaDhingra and Adarsh Gulati



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,



Page 11

Principal  
Govt. Degree College  
Luxettipet- 504 215, Dist. Mancherial.



Laboratory Course

45hrs (3 h / week)

Paper II - Qualitative Analysis - II

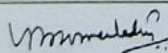
I Semi micro analysis of mixtures

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

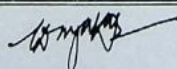
Anions:  $\text{CO}_3^{2-}$ ,  $\text{SO}_3^{2-}$ ,  $\text{S}^{2-}$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{I}^-$ ,  $\text{CH}_3\text{COO}^-$ ,  $\text{NO}_3^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{BO}_3^{3-}$ ,  $\text{SO}_4^{2-}$

Cations:  $\text{Ag}^+$ ,  $\text{Pb}^{2+}$ ,  $\text{Hg}^+$ ,  $\text{Hg}^{2+}$   
 $\text{Pb}^{2+}$ ,  $\text{Bi}^{3+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{As}^{3+/5+}$ ,  $\text{Sb}^{3+/5+}$ ,  $\text{Sn}^{2+/4+}$   
 $\text{Al}^{3+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Fe}^{3+}$   
 $\text{Zn}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Mn}^{2+}$   
 $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$   
 $\text{Mg}^{2+}$ ,  $\text{NH}_4^+$

---

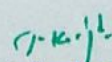


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 12

  
**Principal**  
Govt. Degree College  
Luxettipet - 504 215

**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:**

**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 ( $\sigma_h$ ,  $\sigma_v$ ,  $\sigma_d$ ) 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 ammonium acids and ammonium 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**

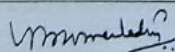
**6 hrs**

Preparation: 1°, 2° and 3° alcohols using Grignard reagent, Ester hydrolysis, Reduction of Carbonyl compounds, carboxylic acids and esters. Physical properties: H-bonding, Boiling point and Solubility. Reactions with Sodium, HX/ZnCl<sub>2</sub> (Lucas reagent), esterification, oxidation with PCC, alk. KMnO<sub>4</sub>, acidic dichromates, conc. HNO<sub>3</sub> and Oppenauer oxidation.

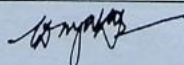
Diols: Pinacol - pinacolone rearrangement

**Phenols:** Preparation: (i) from diazonium salts of anilines, (ii) from benzene sulphonic acids and (iii) Cumenehydroperoxide method.

Properties: Acidic nature, formation of phenoxide and reaction with R-X, electrophilic substitution nitration, halogenation and sulphonation. Reimer-Tiemann reaction, Gattermann-Koch reaction, Azo-coupling reaction, Schotten-Bouman reaction, Houben-Hoesch condensation, FeCl<sub>3</sub> reaction.

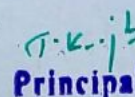


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 13



Principal

Govt. Degree College  
Luxettipet - 504 215

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

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. 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. 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 - hemiacetal and acetal formation. Base catalysed reactions with mechanism- Aldol, Cannizzaro reaction, Perkin reaction, Benzoin condensation, haloform reaction, Knoevenagel condensation. Oxidation reactions –  $KMnO_4$  oxidation and auto oxidation, reduction – catalytic hydrogenation, Clemmenson's reduction, Wolf-kishner reduction, Meerwein-Ponndorf-Verly reduction, reduction with LAH,  $NaBH_4$ . Analysis – 2,4 –DNP test, Tollen's test, Fehlings test, Schiff's test, haloform test (with equations).

**UNIT – III (Physical Chemistry)****15 hr (1h / week)****S3-P-1: Phase Rule****6 h**

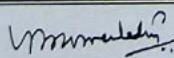
Statement and meaning of the terms – Phase, Component and degrees of freedom, Gibb's Phase rule, phase equilibria of one component system – water system. Phase equilibria of two-component system – Solid-Liquid equilibria, simple eutectic – Pb-Ag system, desilverisation of lead. Solid solutions – compound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

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

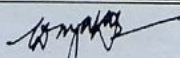
Definition of colloids. Classification of colloids. Solids in liquids (sols): preparations and properties – (including Kinetic, Optical and Electrical stability of colloids) Protective action. Hardy-Schultz law, Gold number. Liquids in liquids (emulsions): Types of emulsions, preparation and emulsifier.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

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

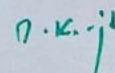
**Adsorption:** Types of adsorption, Factors influencing adsorption. Freundlich adsorption isotherm. Langmuir theory of unilayer adsorption isotherm. Applications.



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,



Page 14

Principal

Govt. Degree College

Luxettipet-504 215, Dist. Mancherial.

## 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 dissymmetric 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 dissymmetric 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

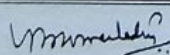
2 h

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

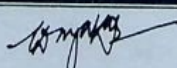
### References:

#### Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3<sup>rd</sup>edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L.Gaus 3<sup>rd</sup>edn Wiley Publishers 2001.
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4<sup>th</sup>edn.
5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
6. Inorganic Chemistry by Shriver and Atkins 3<sup>rd</sup>edn Oxford Press 1999.
7. Textbook of Inorganic Chemistry by R Gopalan
8. College Practical chemistry by V K Ahluwalia, SunithaDhingra and Adarsh Gulati

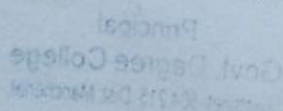


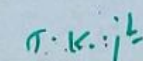
Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 15



  
**Principal**  
Govt. Degree College  
Luxettinet -504 215

## Unit- II

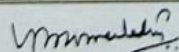
1. Text book of organic chemistry by Soni.
2. General Organic chemistry by Sachin Kumar Ghosh.
3. Text book of organic chemistry by Morrison and Boyd.
4. Text book of organic chemistry by Graham Solomons.
5. Text book of organic chemistry by Bruice Yuranis Powla.
6. Text book of organic chemistry by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

## Unit III

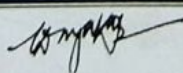
1. Principles of physical chemistry by Prutton and Marron.
2. Text Book of Physical Chemistry by Soni and Dharmahara..
3. Text Book of Physical Chemistry by Puri and Sharma.
4. Text Book of Physical Chemistry by K. L. Kapoor.
5. Colloidal and surface chemistry , M. Satake, Y. Hayashi, Y.Mido, S.A.Iqbal and M.S.sethi
6. Material science by Kakani&Kakani

## Unit IV

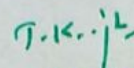
1. Text book of organic chemistry by Morrison and Boyd
2. Text book of organic chemistry by Graham solomons
3. Text book of organic chemistry by Sony
4. Text book of organic chemistry by BruiceyuranisPowla
5. General Organic chemistry by Sachinkumar Ghosh



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,



Principal

Govt. Degree College

Luxettipet-504 215, Dist. Mancherial.

Page 16

**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-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  $[\text{Ni}(\text{NH}_3)_4]^{2+}$ ,  $[\text{NiCl}_4]^{2-}$  and  $[\text{Ni}(\text{CO})_4]$  (b) square planar complexes  $[\text{Ni}(\text{CN})_4]^{2-}$ ,  $[\text{Cu}(\text{NH}_3)_4]^{2+}$ ,  $[\text{PtCl}_4]^{2-}$  (c) octahedral complexes  $[\text{Fe}(\text{CN})_6]^{4-}$ ,  $[\text{Fe}(\text{CN})_6]^{3-}$ ,  $[\text{FeF}_6]^{4-}$ ,  $[\text{Co}(\text{NH}_3)_6]^{3+}$ ,  $[\text{CoF}_6]^{3-}$ . 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  $[\text{MA}_2\text{B}_2]$ ,  $[\text{MA}_2\text{BC}]$ ,  $[\text{M}(\text{AB})_2]$ ,  $[\text{MABCD}]$ . (ii) Octahedral metal complexes of the type  $[\text{MA}_4\text{B}_2]$ ,  $[\text{M}(\text{AA})_2\text{B}_2]$ ,  $[\text{MA}_3\text{B}_3]$  using suitable examples, (b) Optical isomerism in (i). tetrahedral complexes  $[\text{MABCD}]$ , (ii). Octahedral complexes  $[\text{M}(\text{AA})_2\text{B}_2]$ ,  $[\text{M}(\text{AA})_3]$  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:  $\text{Ni}(\text{CO})_4$ ,  $\text{Fe}(\text{CO})_5$ ,  $\text{Fe}_2(\text{CO})_9$ ,  $\text{Fe}_3(\text{CO})_{12}$  and  $\text{Cr}(\text{CO})_6$ , Preparation and properties of  $\text{Ni}(\text{CO})_4$ .

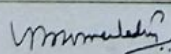
**UNIT - II (Organic chemistry)**

15 h (1 hr/week)

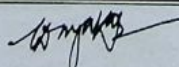
**S4-O-1: Carboxylic acids and derivatives**

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).

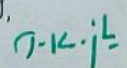


Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

Page 18

  
**Principal**  
**Govt. Degree College**  
**Luxettipet - 504 214**

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

Acidity of  $\alpha$ -Hydrogens of withdrawing groups, structure of carbanion. Preparation of Acetoacetic ester (ethylacetoester) by Claisen condensation and synthetic application of Acetoacetic 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-3 Nitro hydrocarbons:****6 h**

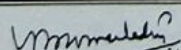
Nomenclature and classification of nitro hydrocarbons. Structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity - halogenation, reaction with  $\text{HNO}_2$  (Nitrous acid), Nef reaction, Mannich reaction, Michael addition and reduction. Aromatic Nitro 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**

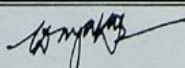
Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific and equivalent conductance with dilution. Migration of ions and Kohlrausch's law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager'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 (calomel electrode) – standard electrode potential, sign conventions, electrochemical series and its significance.

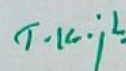
Applications of EMF measurements, Calculation of thermodynamic quantities of cell reactions ( $\Delta G$ ,  $\Delta H$  and  $K$ ). Determination of pH using hydrogen electrode, glass electrode and quinhydrone electrode, Solubility product of  $\text{AgCl}$ . Potentiometric titrations.



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,



Principal

Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

Page 19

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**

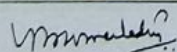
5 h

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

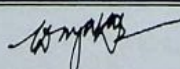
**S4-G-3: Asymmetric synthesis**

5 h

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



Dean



Prof. Gade Dayakar, Chairperson, BOS in Chemistry, KU,

7.10.16

Page 20

**Principal**  
**Govt. Degree College**  
**Luxettipet - 504 216**



**KAKATIYA UNIVERSITY**  
**B.Sc. Final Year (Under CBCS)**  
**SEMESTER – V**  
**(SEC-3) Skill Enhancement Course-III**  
**(FOR ALL SCIENCE FACULTY DEPARTMENTS)**

---

**VERBAL REASONING FOR APTITUDE TEST**

Credits: 2

Theory: 2 hours/week

Marks - 50

**Unit – I NUMBERS AND DIAGRAMMS**

**1.1 Series Completion:** Number series, Alphabet Series

**1.2 Series Completion:** Alpha Numeric Series, Continuous Pattern Series

**1.3 Logical Venn Diagrams**

**1.4 Mathematical Operations:** Problem solving by substitution, Interchange of signs and numbers

**Unit – II ARITHMETICAL REASONING**

**2.1 Mathematical Operations:** Deriving the appropriate conclusions

**2.2 Arithmetical Reasoning:** Calculation based problems, Data based problems

**2.3 Arithmetical Reasoning:** Problems on ages, Venn diagram based problems

**2.4 Cause and Effect Reasoning**

**Text Book:** A Modern Approach to Verbal & Non-Verbal Reasoning by Dr.  
R.S. Aggarwal

Principal  
Govt. Degree College  
Linnakudal 5604215

T.K.J.L  
Principal  
Govt. Degree College  
Linnakudal 5604215

**KAKATIYA UNIVERSITY**  
**B.Sc. Final Year (Under CBCS)**  
**SEMESTER – V**  
**(GE-1) GENERIC ELECTIVE-I**  
**(FOR ALL SCIENCE FACULTY DEPARTMENTS)**

---

**PUBLIC HEALTH AND HYGIENE**  
**Credits: 2**

**Theory :2 hours/week**

**Marks: 50**

**UNIT – I : NUTRITION AND ENVIRONMENT**

- 1.1 Balanced diet and Malnutrition.
- 1.2 Nutritional deficiencies and disorders- Carbohydrates, proteins, lipids, vitamins and minerals.
- 1.3 Occupational, Industrial, agricultural and urban Health-Exposure at work place, urban areas, industrial workers, farmers and agricultural labourers, Health workers and health disorders and diseases.
- 1.4 Environmental pollution and associated Health hazards, Water borne diseases and Air borne diseases.

**UNIT-II : DISEASES AND HEALTH CARE**

- 2.1 Causes, Symptoms, Diagnosis, Treatment and Prevention - Malaria, Filariasis, Measles, Polio, Chicken pox, Rabies, Plague, Leprosy,.
- 2.2 Causes, Symptoms, Diagnosis, Treatment and Prevention of non communicable diseases - Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.
- 2.3 Health care legislation in India – Termination of pregnancy act, Maternity benefit act, Biomedical waste act, ESI act.
- 2.4 First Aid and Health awareness, personal health care record maintenance.

7-12-17  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

KAKATIYA UNIVERSITY  
U.G. CHEMISTRY (Under CBCS)  
B.Sc. Final Year (DSC-1E)  
SEMESTER – V

---

**CHEMISTRY PAPER-V**

Unit-I (Inorganic Chemistry) 11 Hrs

**S5-I-1: Coordination Compounds-II** 09 Hrs

Tetrahedral, square planer with suitable examples. Crystal field stabilization energies and its calculations for various  $d^n$  configurations in octahedral complexes. High Spin Low Spin complexes.

Magnetic properties of transition metal complexes- para, dia, ferro, anti ferromagnetic properties, determination of magnetic susceptibility (Guoy method), spin only formula, calculations of magnetic moments.

Electronic spectra of metal complexes – color of transition metal aqua complexes– d-d transitions. Detection of complex formation - basic principles of various methods- change in chemical properties, solubility, color, pH, conductivity, magnetic susceptibility.

Thermodynamic and kinetic stability of transition of metal complexes. Stability of metal complexes –stepwise and overall stability constant and their relationship. Factors effecting the stability constants. 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

**S5-I-2: Boranes and Carboranes** 02 Hrs

Definition of clusters. Structures of boranes and carboranes- Wade's rules, closo, nido arachno Boranes and Carboranes.

*T.K.J.*  
**Principal**  
Govt. Degree College  
Luxettipet -504 215

**Unit-II (Organic Chemistry)**

11 Hrs

**S5-O-1: Amines, Cyanides and Isocyanides**

07 Hrs

**Amines:**

Nomenclature, classification into 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> Amines and Quaternary ammonium compounds. Preparative methods – 1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties and basic character – Comparative basic strength of Ammonia, methyl amine, dimethyl amine, tri methyl amine and aniline- comparative basic strength of aniline, N- methyl aniline and N,N-dimethyl aniline (in aqueous and non- aqueous medium), steric effects and substituent effects. Use of amine salts as phase transfer catalysts. 4. Chemical Properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg's separation. 5. Reaction with Nitrous acid of 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> (Aliphatic and aromatic amines). Electrophilic substitutions of Aromatic amines – Bromination and Nitration, oxidation of aryl and 3<sup>o</sup> Amines, diazotisation. 6. 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<sub>2</sub>, H and aryl groups. Coupling Reaction of diazonium salts. i) with phenols ii) with anilines. Reduction to phenyl hydrazines

**Cyanides and isocyanides:**

Nomenclature (aliphatic and aromatic) structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. 2. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iii) reduction iv) oxidation.

**S5-O-2: Heterocyclic Compounds**

04 Hrs

Introduction and definition: Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring systems – presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letter and Numbers. Aromatic character – 6- electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions. Resonance structures: Indicating electron surplus carbons and electron deficient hetero atom. Explanation of feebly acidic character of pyrrole, electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene

9-12-13

Principal

Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

Page 4 of 17

obtained from coal tar). Preparation of furan, Pyrrole and thiophene from 1,4,- dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity – Aromaticity – Comparison with pyrrole – one method of preparation and properties – Reactivity towards Nucleophilic substitution reaction – Pchichibabin reaction.

### Unit-III (Physical Chemistry)

#### S5-P-1: Chemical Kinetics

11 Hrs

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 reaction.

First order reaction, derivation of equation for rate constant. Characteristics of first order reaction. Units for rate constant. Half- life period, graph of 1st order reaction, examples. Decomposition of  $H_2O_2$  and decomposition of oxalic acid.

Pseudo first order reaction, Hydrolysis of methyl acetate, inversion of cane sugar, problems

Second order reaction, derivation of expression for 2nd 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.

Zero order reaction: derivation of rate expression, examples i) combination of  $H_2$  and  $Cl_2$  to form  $HCl$ , ii) thermal decomposition of  $HI$  on gold surface characteristics of Zero order reaction units of  $k$ , half-life period and graph, problems.

Determination of order of reaction: i) method of integration, ii) half life method, iii) vant-Hoff differential method iv) Ostwald's isolation method. Problems.

Kinetics of complex reactions (first order only): Opposing reactions, Parallel reactions, Consecutive reactions and Chain reactions. Problems.

Effect of temperature on reaction rate, Arrhenius equation. Temperature coefficient. Concept of energy of activation, determination of energy of activation from Arrhenius equation and by graphical method, problems. Simple collision theory based on hard sphere model explanation of frequency factor, orientation or steric factor. The transition state theory (elementary treatment).

Principal  
Govt. Degree College  
Luxettipet - 504 215

T.K.J.  
Principal  
Govt. Degree College  
Luxettipet - 504 215

**Unit-IV (General Chemistry)**

12 Hrs

**S5-G-1: Molecular spectroscopy**

08 Hrs

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, 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. 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 ( $\sigma$ ,  $\pi$ ,  $n$ ), types of electronic transitions:  $\sigma$ - $\sigma^*$ ,  $n$ - $\sigma^*$ ,  $n$ - $\pi^*$ ,  $\pi$ - $\pi^*$  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.

**S5-G-2: Photochemistry**

04 Hrs

Introduction to photochemical reactions, Difference between thermal and photochemical reactions, Laws of photo chemistry- Grothius - Drapper law, Stark – Einsteins Law of photo chemical 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 absorptions. Singlet and triplet states. Jablonski diagram Explanation of internal conversion, inter- system crossing, Phosphorescence, fluorescence.

Principal  
Govt. Degree College  
Luxettipet-504215, Dist: Mancherial.

## References :

### Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3<sup>rd</sup> edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3<sup>rd</sup> edn Wiley Publishers 2001. Chem.
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4<sup>th</sup> edn.
5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
6. Inorganic Chemistry by Shriver and Atkins 3<sup>rd</sup> edn Oxford Press 1999.

### Unit- II

1. Text book of organic chemistry by Soni.
2. General Organic chemistry by Sachin Kumar Ghosh.
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.

### 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, Sharma and Pattania.
4. Physical Chemistry by Atkins & De Paula, 8th Edition
5. Text Book of Physical Chemistry by K. L. Kapoor.
6. Physical Chemistry through problems by S.K. Dogra.
7. Text Book of Physical Chemistry by R.P. Verma.
8. Elements of Physical Chemistry by Lewis Glasstone.
9. Basics of Chemical Kinetics by G.L. Agarwal
10. Kinetics and mechanism of chemical transformations by Rajaram & Kuriacose

### Unit IV

1. Bioinorganic Chemistry, M.N.Huges
2. Organic spectroscopy, William Kemp
3. Text Book of Physical Chemistry by Puri, Sharma and Pattania.
4. Photochemistry by Gurdeep Raj, Goel publishing house, 5th edition

Principal  
Govt. Degree College  
Luxettipet - 504 215

5-10-11  
Principal  
Govt. Degree College  
Luxettipet - 504 215

Page 7 of 17

**KAKATIYA UNIVERSITY**  
**U.G. CHEMISTRY (Under CBCS)**  
**B.Sc. Final Year (DSE-1E)**  
**SEMESTER – V**

**ELECTIVE-I**

---

**A (T) - INSTRUMENTAL METHODS OF ANALYSIS**

**Unit I: Chromatography-I**

**11Hrs**

**S5-E-A-I: 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, development of the chromatogram, Detection of the spots, factors effecting R<sub>f</sub> values and applications.

**Paper Chromatography:** Principle, choice of paper and solvent systems, development of chromatogram – ascending, descending, radial and two dimensional chromatography and applications

**Unit II: Chromatography-II**

**11Hrs**

**S5-E-A-II: 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.

**Gas Chromatography:** Theory and instrumentation (Block Diagram), Types of stationary phases and carrier gases (mobile phase).

**High performance liquid chromatography:** Theory and instrumentation, stationary phases and mobile phases. Analysis of paracetamol.

**Unit III: Colorimetry and Spectrophotometry**

**12Hrs**

**S5-E-A-III:** General features of absorption – spectroscopy, transmittance, absorbance, and molar absorptivity. Beer Lambert's law and its limitations, difference between Colorimetry and Spectrophotometry.

Instruments – Single beam UV- Visible Spectrophotometer, Double beam UV- Visible Spectrophotometer. Lamps used as energy sources. Verification of Beer's law. Estimation of iron in water samples by thiocyanate method. Estimation of (i) Chromium and (ii) Manganese in steel.

Principal  
Govt. Degree College  
Luxettipet - 504 215

Principal  
Govt. Degree College  
Luxettipet - 504 215



**IR Spectrophotometer:** Principle, Sources of Radiations, Sampling, Block diagram of FT-IR Spectrophotometer.

**Unit IV: Electro analytical methods**

11Hrs

**S5-E-A-IV:** Types of Electro analytical 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; Introduction 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  $\text{Cl}^-$  using  $\text{AgNO}_3$ , Determination of Aspirin with  $\text{KOH}$ .

**Recommended Text Books and Reference Books**

1. Analytical Chemistry by David Krupadanam, Universities Press (India) Limited.
2. D.A. Skoog, F.J. Holler, T.A. Nieman, Principles of Instrumental Analysis, Engage earning India Ed.
3. D. A. Skoog, D.M. West, F.J. Holler, Fundamentals of Analytical Chemistry 6<sup>th</sup> Ed., Saunders College Publishing, Fort worth (1992).
4. Willard, H.H., Merritt, L.L., Dean, J. & Settoe, F.A. Instrumental Methods of Analysis. 7<sup>th</sup> Ed. Wadsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
5. Harris, D. C. Quantitative Chemical Analysis, W. H. Freeman.2007.
6. Dean, J. A. Analytical Chemistry Notebook, McGraw Hill.
7. Day, R. A. & Underwood, A. L. Quantitative Analysis, Prentice Hall of India.
8. Freifelder, D. Physical Biochemistry 2nd Ed., W.H. Freeman and Co., N.Y. USA, 1982.
9. Cooper, T.G. The Tools of Biochemistry, John Wiley and Sons, N.Y. USA. 16, 1977.
10. Vogel, A. I. Vogel's Qualitative Inorganic Analysis 7th Ed., Prentice Hall.
11. Vogel, A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Prentice Hall.
12. Robinson, J.W. Undergraduate Instrumental Analysis 5th Ed., Marcel Dekker, Inc, New York (1995).
13. Analytical Chemistry 7<sup>th</sup> edition by Gary D. Christian (2004).
14. B. K. Sharma, Industrial Chemistry (including Chemical Engineering). Edn. (1997).
15. M.N Sastry, Separation Methods, Paperback (2004), Himalaya Publications.
16. Usharani Analytical Chemistry Paperback (2000) Narosa Publications

7-10-14  
Principal  
Govt. Degree College  
Luxettipet-504 215, Dist: Mancherial.

**B.Sc., III YEAR CHEMISTRY**

**SEMESTER-VI**

**DSE-A: Chemistry Paper-VI**

*(Medicinal Chemistry)*

**(04 credits)**

**60 Hrs (04 Hrs/week)**

**Unit- I: Introduction and Terminology (15 Hrs)**

**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 (ADI), 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.

**Unit-II: Enzymes and Receptors (15 Hrs)**

**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<sub>2</sub> group, quaternary ammonium salts and double bond. Structure – activity relationships of drug molecules, explanation with sulfonamides.

**Unit- III: Synthesis and Therapeutic Activity of Drugs (15 Hrs)**

**S6-E-A-III:** Introduction, synthesis and therapeutic activity of:

**Chemotherapeutics:** Sulphanilamide, dapsone, Penicillin-G (semi synthesis), Chloroquin, Isoniazid, Cisplatin and AZT.

**Drugs to treat metabolic disorders:** Anti diabetic - Tolbutamide; Anti-inflammatory – Ibuprofen; Cardiovascular- Glyceryl trinitrate; Antipyretic (paracetamol, aspirin) and Antacid- Omeprazole.

Page 2 of 6

*Handwritten signature*

*Principal*  
**Principal**  
Govt. Degree College  
Luxettipet -504 215

*Handwritten signature*

**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 Vitamins and Micronutrients (15 Hrs)**

**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 .

**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.

*Er. J. K. Jh*

*J. K. Jh*

*N. V. Reddy*

*J. K. Jh*

Principal  
Govt. Degree College  
Luxettipet-504 215, Dist. Mancherial.

DSC-1A  
BS:104

## DIFFERENTIAL CALCULUS

Theory: 4 credits and Practicals: 1 credit  
Theory: 4 hours/week and Practicals: 2 hours/week

Objective: the course is aimed at exposing the students to some basic notions in differential calculus.

Outcome: by the time students complete the course they realize wide ranging applications of the subject.

### Unit – I

Successive differentiation:

Higher order derivatives, Calculation of the nth derivative, Some standard results, Determination of nth derivative of rational functions, The nth derivatives of the products of the powers of sines and cosines, Leibnitz's theorem, The nth derivative of the product of two functions.

Expansion of Functions:

Maclaurin's theorem, Taylor's theorem.

Mean Value Theorems:

Rolle's theorem, Lagrange's mean value theorem, Meaning of the sign of derivative, Graphs of hyperbolic functions, Cauchy's mean value theorem, Higher derivatives, Formal expansions of functions.

### Unit – II

Indeterminate Forms:

Indeterminate forms, The indeterminate form  $0/0$ , The indeterminate form  $\infty/\infty$ , The indeterminate form  $0 \cdot \infty$ , The indeterminate form  $\infty - \infty$ , The indeterminate forms  $0^0$ ,  $1^\infty$ ,  $\infty^0$ .

Curvature and Evolutes:

Introduction, Definition of curvature, Length of arc as a function, Derivative of arc, Radius of curvature-cartesian equations, Newtonian method, Centre of curvature, Chord of curvature, Evolutes and involutes, Properties of the evolute.

### Unit – III

Partial Differentiation – Homogeneous Functions – Total Derivative:

Introduction, Functions of two variables, Neighbourhood of a point (a, b), Continuity of a Function of two variables, continuity at a point, Limit of a function of two variables, Partial derivatives, Geometrical representation of a function of two variables, Homogeneous functions, Theorem on total differentials; composite functions; differentiation of composite functions; implicit functions.

### Unit – IV

Maxima and Minima:

Maxima and minima of function of two variables, Lagrange's method of undetermined multipliers.

T.K. J  
Principal  
Govt. Degree College  
Luxettinet - 504 215

Asymptotes:

Definition, Determination of asymptotes, Working rules of determining asymptotes, Asymptotes by inspection, Intersection of a curve and its asymptotes, Asymptotes by expansion, Position of a curve with respect to an asymptote, Asymptotes in polar co-ordinates.

Envelopes:

One parameter family of curves, Consider the family of straight lines, Definition, Determination of envelope, Theorem, To prove that, in general, the envelope of a family of curves touches each member of the family, If  $A$ ,  $B$ ,  $C$  are functions of  $x$  and  $y$  and  $m$  is a parameter then the envelope of  $Am^2+Bm+C = 0$  is  $B^2 = 4AC$ , Two parameters connected by a relation, When the equation to a family of curves is not given, but the law is given in accordance with which any member of the family can be determined, Envelopes of polar curves, Envelopes of normals(Evolutes).

Text: Shanti Narayan and Mittal, Differential Calculus

References: William Anthony Granville, Percey F Smith and William Raymond Longley, Elements of the Differential and integral calculus

Joseph Edwards, Differential calculus for beginners

Smith and Minton, Calculus

Elis Pine, How to Enjoy Calculus

Hari Kishan, Differential Calculus

## 2.2 Differential Equations

DSC-1B

BS:204

Theory: 4 credits and Practicals: 1 credits  
Theory: 4 hours /week and Practicals: 2 hours /week

**Objective:** The main aim of this course is to introduce the students to the techniques of solving differential equations and to train to apply their skills in solving some of the problems of engineering and science.

**Outcome:** After learning the course the students will be equipped with the various tools to solve few types differential equations that arise in several branches of science.

### Unit- I

Differential Equations of first order and first degree: Exact differential equations - Integrating Factors - Change in variables - Total Differential Equations - Simultaneous Total Differential Equations - Equations of the form  $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ . Differential Equations first order but not of first degree: Equations Solvable for  $y$  - Equations Solvable for  $x$  - Equations that do not contain  $x$  (or  $y$ )- Clairaut's equation.

### Unit- II

Higher order linear differential equations: Solution of homogeneous linear differential equations with constant coefficients - Solution of non-homogeneous differential equations  $P(D)y = Q(x)$  with constant coefficients by means of polynomial operators when  $Q(x) = be^{ax}, b \sin ax/b \cos ax, bx^k, Ve^{ax}$ .

### Unit- III

Method of undetermined coefficients - Method of variation of parameters - Linear differential equations with non constant coefficients - The Cauchy - Euler Equation.

### Unit- IV

Partial Differential equations- Formation and solution- Equations easily integrable - Linear equations of first order - Non linear equations of first order - Charpit's method - Homogeneous linear partial differential equations with constant coefficient - Non homogeneous linear partial differential equations - Separation of variables.

#### Text:

- Zafar Ahsan, *Differential Equations and Their Applications*

DSC- 1C

## REAL ANALYSIS

BS: 304

Theory: 4 credits and Practical 1 credit  
Theory: 4 hours/week and Practicals : 2 hours/ week

**Objective :** The course is aimed at exposing the students to the foundations of analysis which will be useful in understanding various physical phenomena.

**Outcome:** After the completion of the course students will be in a position to appreciate beauty and applicability of the course.

### Unit- I

Sequences- Limits of sequences- A Discussion about Proofs- Limit Theorems for Sequences  
– Monotone Sequences and Cauchy Sequences

### Unit- II

Subsequences- Lim sup's and Lim inf's Series- Alternating Series and Integrals Tests.  
Continuity : Continuous functions- Properties of Continuous functions.

### Unit – III

Sequence and Series of Functions: Power Series- Uniform Convergence – More on  
Uniform Convergence- Differentiation and Integration of Power Series (Theorems in this  
section without Proofs)

### Unit – IV

Integration : The Riemann Integral- Properties of Riemann Integral- Fundamental Theorem  
of Calculus.

**Text :** Kenneth A Ross, Elementary Analysis- The Theory of Calculus

#### **References :**

William F.Trench: Introduction to Real Analysis

*D.K.J.*  
**Principal**  
Govt. Degree College  
Luxettinet -504 215

## 2.8 Algebra

DSC-1D

BS:404

Theory: 4 credits and Practicals: 1 credits  
Theory: 4 hours /week and Practicals: 2 hours /week

**Objective:** The course is aimed at exposing the students to learn some basic algebraic structures like groups, rings etc.

**Outcome:** On successful completion of the course students will be able to recognize algebraic structures that arise in matrix algebra, linear algebra and will be able to apply the skills learnt in understanding various such subjects.

### Unit- I

Groups: Definition and Examples of Groups- Elementary Properties of Groups-Finite Groups; Subgroups -Terminology and Notation -Subgroup Tests - Examples of Subgroups Cyclic Groups: Properties of Cyclic Groups - Classification of Subgroups Cyclic Groups-Permutation Groups: Definition and Notation -Cycle Notation-Properties of Permutations -A Check Digit Scheme Based on  $D_5$ .

### Unit- II

Isomorphisms : Motivation- Definition and Examples -Cayley's Theorem Properties of Isomorphisms -Automorphisms-Cosets and Lagrange's Theorem Properties of Cosets 138 - Lagrange's Theorem and Consequences-An Application of Cosets to Permutation Groups -The Rotation Group of a Cube and a Soccer Ball -Normal Subgroups and Factor Groups ; Normal Subgroups-Factor Groups -Applications of Factor Groups -Group Homomorphisms - Definition and Examples -Properties of Homomorphisms -The First Isomorphism Theorem.

### Unit- III

Introduction to Rings: Motivation and Definition -Examples of Rings -Properties of Rings -Subrings -Integral Domains : Definition and Examples -Characteristics of a Ring -Ideals and Factor Rings; Ideals -Factor Rings -Prime Ideals and Maximal Ideals.

### Unit- IV

Ring Homomorphisms: Definition and Examples-Properties of Ring- Homomorphisms -The Field of Quotients Polynomial Rings: Notation and Terminology.

**Text:**

- Joseph A Gallian, *Contemporary Abstract algebra (9th edition)*



Kakatiya University  
B.Sc. Mathematics, V Semester  
LINEAR ALGEBRA

DSC-1E  
BS:503

Theory: 3 credits and Practicals: 1 credits  
Theory: 3 hours/week and Practicals: 2 hours/week

**Objective:** The students are exposed to various concepts like vector spaces, bases, dimension, Eigen values etc.

**Outcome:** After completion this course students appreciate its interdisciplinary nature.

**UNIT-I**

Vector Spaces : Vector Spaces and Subspaces -Null Spaces, Column Spaces, and Linear Transformations -Linearly Independent Sets; Bases -Coordinate Systems

**UNIT-II**

The Dimension of a Vector Space, Rank-Change of Basis - Eigenvalues and Eigenvectors .

**UNIT-III**

The Characteristic Equation, Diagonalization -Eigenvectors and Linear Transformations -Complex Eigenvalues - Applications to Differential Equations .

**UNIT-IV**

Orthogonality and Least Squares : Inner Product, Length, and Orthogonality -Orthogonal Sets.

**TEXT:** David C Lay, *Linear Algebra and its Applications 4e*

**References:**

- S Lang, *Introduction to Linear Algebra*
- Gilbert Strang, *Linear Algebra and its Applications*
- Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence; *Linear Algebra*
- Kuldeep Singh; *Linear Algebra*
- Sheldon Axler; *Linear Algebra Done Right*

Kakatiya University  
B.Sc. Mathematics, V Semester  
SOLID GEOMETRY

DSE-1E/A  
BS:506

Theory: 3 credits and Practicals: 1 credits  
Theory: 3 hours /week and Practicals: 2 hours/week

**Objective:** Students learn to describe some of the surfaces by using analytical geometry.

**Outcome:** Students understand the beautiful interplay between algebra and geometry.

UNIT- I

Sphere: Definition-The Sphere Through Four Given Points - Equations of a Circle - Intersection of a Sphere and a Line - Equation of a Tangent Plane - Angle of Intersection of Two Spheres - Radical Plane.

UNIT- II

Cones : Definition-Condition that the General Equation of second degree Represents a Cone - Cone and a Plane through its Vertex - Intersection of a Line with a Cone. The Right Circular Cone.

UNIT- III

Cylinder: Definition-Equation of a Cylinder-Enveloping Cylinder - The Cylinder - The Right Circular Cylinder.

UNIT- IV

The Conicoid: The General Equation of the Second Degree-Intersection of Line with a Conicoid- Plane of contact-Enveloping Cone and Cylinder.

**TEXT:** Shanti Narayan and P K Mittal, *Analytical Solid Geometry* (17e)

**References:**

- Khaleel Ahmed, *Analytical Solid Geometry*
- S L Loney , *Solid Geometry*
- Smith and Minton, *Calculus*

T.K.ojha  
Principal  
Govt. Degree College  
Luxettinet -504 215

Kakatiya University  
B.Sc. Mathematics, V Semester  
INTEGRAL CALCULUS

DSE-1E/B  
BS:506

Theory: 3 credits and Practicals: 1 credits  
Theory: 3 hours/week and Practicals: 2 hours/week

**Objective:** Techniques of multiple integrals will be taught.

**Outcome:** Students will come to know about its applications in finding areas and volumes of some solids.

UNIT-I

Areas and Volumes: Double Integrals-Double Integrals over a Rectangle-Double Integrals over General Regions in the Plane.

UNIT-II

Double integrals, Changing the order of Integration, Triple Integrals: The Integrals over a Box.

UNIT-III

Elementary Regions in Space-Triple Integrals in General, Triple Integral.

UNIT-IV

Change of Variables: Coordinate Transformations-Change of Variables in Triple Integrals.

**TEXT:** Susan Jane Colley, *Vector Calculus* (4e)

**References**

- Smith and Minton, *Calculus*
- Shanti Narayan and Mittal, *Integral calculus*
- Ulrich L. Rohde, G. C. Jain, Ajay K. Poddar and A. K. Ghosh: *Introduction to Integral Calculus*

J.K.J.L  
Principal  
Govt. Degree College  
Luxettipet - 504 215

Kakatiya University  
B.Sc. Mathematics, VI Semester  
NUMERICAL ANALYSIS

DSC-1F  
BS:603

Theory: 3 credits and Practicals: 1 credits  
Theory: 3 hours/week and Practicals: 2 hours/week

**Objective:** Students will be made to understand some methods of numerical analysis.

**Outcome:** Students realize the importance of the subject in solving some problems of algebra and calculus.

**UNIT-I**

Solutions of Equations in One Variable : The Bisection Method - Fixed-Point Iteration - Newtons Method and Its Extensions - Error Analysis for Iterative Methods - Accelerating Convergence - Zeros of Polynomials and Mullers Method - Survey of Methods and Software.

**UNIT-II**

Interpolation and Polynomial Approximation: Interpolation and the Lagrange Polynomial - Data Approximation and Nevilles Method - Divided Differences.

**UNIT-III**

Hermite Interpolation - Cubic Spline Interpolation. Numerical Differentiation and Integration: Numerical Differentiation - Richardsons Extrapolation

**UNIT-IV**

Elements of Numerical Integration- Composite Numerical Integration - Romberg Integration - Adaptive Quadrature Methods - Gaussian Quadrature.

**TEXT:** Richard L. Burden and J. Douglas Faires, *Numerical Analysis (9e)*

**References**

- M. K. Jain, S. R. K. Iyengar and R. K. Jain, *Numerical Methods for Scientific and Engineering computation*
- B. Bradic, *A Friendly introduction to Numerical Analysis*

D.K.L  
Principal  
Govt. Degree College  
Luxettinet - 504 214

Kakatiya University  
B.Sc. Mathematics, VI Semester  
COMPLEX ANALYSIS

DSE-1F/A  
BS:606

**Theory: 3 credits and Practicals: 1 credits**  
**Theory: 3 hours/week and Practicals: 2 hours/week**

**Objective:** Analytic Functions, contour integration and calculus of residues will be introduced to the students.

**Outcome:** Students realize calculus of residues is one of the power tools in solving some problems, like improper and definite integrals, effortlessly.

**UNIT-I**

Regions in the Complex Plane - Analytic Functions - Functions of a Complex Variable - Mappings - Mappings by the Exponential Function - Limits - Theorems on Limits - Limits Involving the Point at Infinity - Continuity - Derivatives - Differentiation Formulas - Cauchy-Riemann Equations - Sufficient Conditions for Differentiability - Polar Coordinates-Harmonic Functions.

**UNIT-II**

Elementary Functions: The Exponential Function - The Logarithmic Function - Branches and Derivatives of Logarithms - Some Identities Involving Logarithms Complex Exponents - Trigonometric Functions - Hyperbolic Functions.

**UNIT-III**

Integrals: Derivatives of Functions  $w(z)$  - Definite Integrals of Functions  $w(z)$  - Contours - Contour Integrals - Some Examples - Examples with Branch Cuts - Upper Bounds for Moduli of Contour Integrals - Antiderivatives.

**UNIT-IV**

Cauchy-Goursat Theorem - Proof of the Theorem - Simply Connected Domains - Multiply Connected Domains - Cauchy Integral Formula - An Extension of the Cauchy Integral Formula - Some Consequences of the Extension - Liouville's Theorem and the Fundamental Theorem of Algebra- Maximum Modulus Principle.

**TEXT:** James Ward Brown and Ruel V. Churchill, *Complex Variables and Applications* (8e)

**References:**

- Joseph Bak and Donald J Newman, *Complex analysis*
- Lars V Ahlfors , *Complex Analysis*
- S.Lang, *Complex Analysis*
- B Choudary, *The Elements Complex Analysis*

T.K.J.L  
Principal  
Govt. Degree College  
Luxettimet -504 214

# Contents

1. **What Is My Name?** — *P. Sathyavathi* 1  
Paragraphs + Listening for sounds, stress and intonation  
+ Greeting, taking leave and introducing oneself and others  
+ Nouns + Homonyms
2. **Pochamma's Goddess** — *Radha D'Souza* 12  
Essays + Listening for theme + Making requests  
+ Pronouns + Homophones
3. **The Woodrose** — *Abburi Chaya Devi* 23  
Descriptive essays + Listening for theme  
+ Asking for the time and directions + Articles + Homographs
4. **The Kitchen** — *Vimala* 32  
Narrative essays + Listening for main ideas  
+ Inviting + Adjectives + Synonyms
5. **Yanadi Kotadu** — *Sujatha Gidla* 40  
Expository essays + Listening for main ideas  
+ Apologising + Kinds of verbs + Antonyms
6. **Adivasis** — *Kancha Ilaiah* 50  
Argumentative essays + Listening for details  
+ Interrupting + Tenses + Prefixes
7. **For Vegetarians Only** — *Sky Baaba* 60  
Formal letters + Listening for details  
+ Asking for and giving opinions + Adverbs + Suffixes
8. **Hunger** — *Jayanta Mahapatra* 71  
Emails + Listening for information  
+ Agreeing and disagreeing  
+ Declarative, interrogative, imperative and exclamatory sentences  
+ Compound words
9. **From Untouchable Spring** — *G. Kalyana Rao* 79  
Application letters and curricula vitae + Listening for information  
+ Suggesting and advising + Simple, compound and complex sentences  
+ Collocations
10. **Lawley Road** — *R.K. Narayan* 88  
Memorandums + Listening for facts  
+ Giving instructions + Question tags + Phrasal verbs

# Contents

<i>Preface</i>	v
<b>UNIT 1: SIX SIGMA: DARBRAWALA</b> Global Comprehension / Goal Setting / Synonyms / Speech Sounds and Corresponding Symbols	1
<b>UNIT 2: YET, I AM NOT DEFEATED!</b> by Jyothi Reddy Local Comprehension / Time Management / Antonyms / Word Stress	14
<b>UNIT 3: THINKING?</b> by Walter D Wintle Interview Skills / Analogies / Mother Tongue Interference in English Language Learning	26
<b>UNIT 4: TOXICOLOGY</b> by Qamar Rahman Making Predictions and Guessing / Personal Appearance and Facial Expressions / Syllogisms / Commonly Mispronounced Words	33
<b>UNIT 5: PATRICIA NARAYAN: AN ENTREPRENEUR BY ACCIDENT</b> Understanding the Plan of the Text / Confidence / One-Word Substitutes / Using the Dictionary to Learn the Correct Pronunciation of Words	41
<b>UNIT 6: WHEN I BORN, I BLACK</b> by Anonymous Teamwork / Phrasal Verbs / Describing People, Places and Objects	48
<b>UNIT 7: SATYA NADELLA: CEO of Microsoft</b> Guessing the Meanings of Unfamiliar Words / Group Discussions / Idioms / Reporting What Others Said	55
<b>UNIT 8: CHHAVI RAJAWAT: VILLAGE MAYOR OF SODA</b> by Tann vom Hove and Mayraj Fahim Skimming and Scanning / Presentations / Commonly Misspelt Words / Talking about Future Plans	65

D.K.J.

Principal  
Govt. Degree College,  
Lixettinet-504 215