

DEPARTMENT OF BIOCHEMISTRY

BRIEF HISTORY

- ▶ As there is great demand for the *Biochemists*, the Government of Andhra Pradesh has come forward to introduce the subject of *Biochemistry* at the Degree level in the year 1999.
- ▶ The Department of Biochemistry was established in June'1999. Dr. Mushtaq Ahmed, Reader in Zoology was the first in charge of the Department. Later Sri. K. Satyanarayana Chary, Lecturer in Chemistry has taken the charge of the Department till 2013. Then R. Shyamala Chandra was the in charge of the Department till 2018. Currently A. Chandra Shekhar is the in charge of department.
- ▶ We have faculty, who work with devotion, commitment and discipline for the orderly growth and development of the institution and this has resulted in excellent standards making it a prestigious institution in the town among university constituent and affiliated colleges under the jurisdiction of Satavahana University by getting distinctions every year.

MISSION:

“We the department of **Biochemistry** will create and facilitate an environment for the students to probe, search, learn and evolve into an effective social being.”

VISION:

“Search for **Biochemistry** within and beyond by observation and analysis to produce a better human being.”

SCOPE AND CAREER IN BIOCHEMISTRY

- ▶ BIOCHEMISTRY is a branch of science which deals with chemistry of living organisms and that of their biological processes.
- ▶ A career in BIOCHEMISTRY will involve the person's ability to comprehend chemical combinations and reactions that will take place because of the biological processes such as growth, reproduction, metabolism, heredity etc.

Job Prospects: A graduate in biochemistry can work with fields in medical, agriculture, Public health care, forensic etc., there is a tremendous scope of research.

Public and Private Companies offer job opportunities in Drug Manufacturing Companies, Environment Pollution Control, Agriculture and Fisheries, Forensic Science, Regulation and Quality control in almost all fields of food industry etc.

FACULTY PROFILE:

Sl. No	Name	Designation	Qualifications	Experience
1	A.CHANDRA SHEKHAR	Asst. Professor & In charge of the Dept.	M.Sc., NET, (Ph.D.)	10 Years

Course outcomes (COs)-B.Sc. (Biochemistry)

At the successful completion of the course, the students are expected

- Become familiar with the fundamentals of Biochemistry at undergraduate level.
- Exhibit certain levels of learning outcomes such as, Understanding of discipline, critical thinking, problem solving, analytical and scientific reasoning, research/industry related skills, etc.
- Get exposed to a wide range of careers that combine biology, and medicine.

CO1. Chemistry of Biomolecules: The students will get basics of the biomolecules & will understand the structure, functions and biochemical reactions of the biomolecules.

CO2. Chemistry of Nucleic Acids & Biochemical Techniques: To understand the chemistry & functions of nucleic acids and to gain an insight into the principle of working of various techniques used for the biochemical analysis of biomolecules.

CO3. Bioenergetics, biological oxidation & Enzymology: The student will also have an understanding about the fundamental energetics of biochemical processes. The student will be able to describe structure, functions, mechanisms of action of enzymes, kinetics of enzyme catalyzed reactions and enzyme inhibitory and regulatory process.

CO4. Intermediary Metabolism: To have a indepth view on metabolism and to describe how biomolecules (carbohydrates, lipids, amino acids and nucleic acids) are synthesized and degraded in the body.

CO5. Physiology & Clinical Biochemistry: The students will gain knowledge regarding the digestion of biomolecules and physiology of various organs such as heart, muscle and nervous system. The student will also gain knowledge regarding the chemistry, physiological role and

disorders of various hormones of human body. To gain knowledge regarding the clinical tests to identify various diseases pertaining to liver, kidney, heart.

CO6. Molecular Biology: To understand the basics of replication, transcription and translation processes and their regulation.

CO7. Nutrition & Immunology: The student will be able to comprehend the structure, role of nutrients & their deficiency disorders .To be able to understand about the organs and cells involved in the immunological response, immunoglobulin's, antigen-antibody interactions and vaccines. To get overall knowledge on human body defense mechanism.

CO8. Microbiology & r-DNA Technology: The student will be able to understand basic knowledge on bacteria and viruses and the basics of genetic engineering, tools of r-DNA technology, principle and applications of blotting and gene cloning.

CO9. Cell biology & genetics: To have in depth understanding of cell structure and its functions and to be able to describe the gene interactions, mutations, linkage analysis and bacterial genetics.

CO10. Biotechnology: To have basic knowledge regarding the plant tissue culture, animal tissue culture techniques and to get knowledge on microbial and environmental biotechnology.

DEPARTMENT LIBRARY:

- ❖ Though the central library (UG, PG) has a total number of books related to Biochemistry, the Department also maintains its own stock of books for the benefit of staff and students. At present it has 20 Books.

Modern Teaching methods in practice:

- In addition to the traditional lecture method, the following modern methods are practiced by our faculty
- Continuous comprehensive evaluation
- Emphasis on understanding the concepts
- Emphasis on skill building, life skills and values
- Collaborative learning
- Activity-based learning and learning labs
- Interdisciplinary learning

Highlights:

1. Advanced learners Projects
2. Slow learners Assignments and Remedial classes
3. PPT slides
4. Seminars by students
5. Question Bank and Previous papers
6. Extension lectures by Eminent personalities

Lab Facilities Available:

- Autoclave
- Colorimeter
- Water bath
- Thin Layer Chromatography
- Spectrophotometer
- Electrophoresis
- Hot Plates
- Centrifuges
- Microscopes
- Incubator
- Hot air oven
- pH meter
- Hemometers
- Neubaur counting chamber

B.Sc. Biochemistry Syllabus

Semester - I DSC -1A

Semester – I: Paper-BS104 (Theory): Chemistry of Biomolecules (4 Credits; 4 Hr/week)

Credit- I: Introduction

1. Scope of Biochemistry
2. Water as biological solvent
3. Weak acids and bases
4. pH and concept of Buffers
5. Biological buffers and their physiological importance
6. Henderson- Hasselbalch equation (Simple numerical problems)
7. Concept of Stereo chemistry with reference to Carbohydrates and Amino acids.

Credit – II: Amino acids & proteins

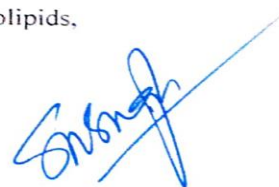
1. Classification, structure, stereochemistry and chemical reactions of amino acids.
2. Titration curve of glycine & pK values.
3. Essential, nonessential amino acids and non-protein amino acids.
4. Peptide bond- Nature and conformation, Naturally occurring peptides –Glutathione and Brain peptides (Enkephalin)
5. Outlines of protein classification, structural organization of proteins: primary, secondary, tertiary and quaternary structures (ex. hemoglobin & myoglobin)
6. General properties of proteins, denaturation and renaturation of proteins.
7. Determination of amino acid composition of proteins.

Credit - III: Carbohydrates

1. Classification of carbohydrates
2. Monosaccharides : Structures, Fisher and Haworth projections
3. Reactions of monosaccharides, Mutarotation
4. Amino sugars and Glycosides
5. Disaccharides, Oligosaccharides and Polysaccharides
6. Storage and Structural Polysaccharides
7. Glycosaminoglycans and Bacterial cell wall polysaccharides.

Credit – IV: Lipids

1. Classification of lipids, Reactions & properties of lipids
2. Saturated, Unsaturated and Essential fatty acids
3. Structure and functions of Neutral fats, waxes, phospholipids, sphingolipids,
4. Structure and functions of cholesterol and glycolipids.
5. Prostaglandins and lipoproteins.



6. Bio membranes, behavior of amphipathic lipids in water, formation of micelles, bilayers, vesicles, Liposomes

7. Membrane composition and fluid mosaic model.

References:

1. Lehninger's Principles of Biochemistry – Nelson.D.L. and Cox.M.M., Freeman & Co.
2. Biochemistry – Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co.
3. Biochemistry – Voet.D and Voet., J.G., John Wiley & Sons
4. Textbook of Biochemistry – West.E.S., Todd.W.R, Mason.H.S..and. Bruggen, J.T.V., Oxford & IBH Publishers.
5. Outlines of Biochemistry – Conn.E.E., Stumpf.P.K., Bruening, G and Doi.R.H., John Wiley & Sons .
6. Harper's Illustrated Biochemistry – Murray, R.K., Granner.D.K. & Rodwell.V.W., McGraw-Hill
7. Biochemistry-Lippincott's Illustrated Reviews. Champe, P.C. and Harvey, R. A. Lippincott
8. Fundamentals of Biochemistry –Jain, J.L., Jain, S., Jain, N. S. Chand & Co.
9. Biochemistry – Satyanarayana. U and Chakrapani. U, Books & Allied Pvt. Ltd.



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DSC – 1A
Semester – I: BS 104; Practicals: Qualitative Analysis of Biomolecules
(1 Credits; 2 Hr/week)

1. Laboratory general safety procedures
2. Preparation of standard solutions (Molar, Normal and percent solutions)
3. Determination of pKa values of amino acids by titration (Glycine)
4. Preparation of buffers (Acetate and Phosphate buffers)
5. Qualitative identification of Carbohydrates
6. Qualitative identification of Amino acids
7. Qualitative identification of Lipids

References

1. Experimental Biochemistry-A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern



Semester - II
DSC – 1B
Semester – II: Paper-BS204 (Theory) Chemistry of Nucleic Acids
and Biochemical Techniques
(4 Credits; 4 Hr/week)

Credit - I: Composition of Nucleic acids

1. Nature (functions) of nucleic acids.
2. Structure of purines and pyrimidines.
3. Nucleosides and Nucleotides
4. DNA & RNA.
5. Stability and formation of phosphodiester linkages
6. Effect of acids, alkali and nucleases and phosphodiester linkages
7. Photochemical and Spectral characteristics of Nucleic acid.

Credit - II: Structure of nucleic acids

1. Watson& Crick DNA double helix structure.
2. Introduction to circular DNA, supercoiling, helix to random coil transition,
3. denaturation of nucleic acids.
4. Hyperchromic effect
5. T_m values and their significance.
6. Reassociation kinetics, cot curves and their significance.
7. Different types of RNA and their biological functions.

Credit - III: Spectrophotometric and Centrifugation Techniques

1. Colorimetry and spectrophotometry.
2. Beer-Lamberts law and its limitations.
3. UV and Visible spectra
4. Molar extinction coefficient.
5. Principle of fluorimetry
6. Principle of Centrifugation techniques
7. Types of centrifugation and their applications

Credit – IV: Chromatography and Electrophoresis techniques

1. Introduction and principles of chromatographic techniques
2. Paper chromatography and applications
3. Thin layer chromatography and applications
4. Gel filtration (molecular sieve) chromatography
5. Ion exchange Chromatography
6. Affinity chromatography
7. Principle of electrophoresis and applications: Native, SDS-PAGE and Agarose gel electrophoresis



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References

1. Biochemistry – Voet.D and Voet., J.G., John Wiley & Sons
2. Textbook of Biochemistry – West.E.S., Todd.W.R, Mason.H.S..and. Bruggen, J.T.V., Oxford & IBH Publishers.
3. Outlines of Biochemistry – Conn.E.E., Stumpf.P.K., Bruening, G and Doi.R.H., John Wiley & Sons .
4. Principles and Techniques of Practical Biochemistry- Wilson, K. and Walker, J. Cambridge Press.
5. The Tools of Biochemistry- Cooper, T. G. John Wiley & Sons Press.
6. Physical Biochemistry- Friefelder, D. W.H. Freeman Press.
7. Analytical Biochemistry – Holme.D.J. and Peck.H., Longman.
8. Biophysical Chemistry: Principle and techniques- Upadhyay A, Upadhyay K and Nath. N. Himalaya Publishing House.
9. Experimental Biochemistry- Clark Jr. J.M and Switzer, R. L. Freeman & Co..



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DSC – 1B
Semester – II: Paper-BS204; Practicals: Quantitative Analysis of Biomolecules
(1 Credits; 2 Hr/week)

1. Amino acid Estimation by Ninhydrin method
2. Protein Estimation by Biuret
3. Protein estimation by Folin's Method
4. Estimation of Total Sugars by Anthrone Method
5. Estimation of Total Reducing Sugars by Dinitrosalicylate method
6. Estimation of Keto sugar by Roe's resorcinol Method
7. Estimation of total sugars by Phenol-sulphuric acid method

References

1. Experimental Biochemistry-A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern



SEMESTER-III

SEC - 1

Semester III- Paper BS 301: BASICS IN BIOCHEMICAL CALCULATIONS AND BIOSTATISTICS (2 Credits; 2 Hr/week)

Credit-I: Basic Biochemical Calculations

1. Units and measurements
2. Concentration of analyte: Mole, Molarity, Normality and percent solutions
3. Concept of density and specific gravity
4. Enzyme activity, Specific activity and Purity index
5. pH scale and measurement of redox potential
6. Concept of buffers and Buffer preparations
7. Construction of calibration curve and absorption curve (λ_{max})

Credit-II: Biostatistics

1. Basic statistical concepts: Population, sampling and variables
2. Biostatistics: Measures of central tendency (Mean, Median Mode) :
3. Measurement of dispersion: Standard deviation, standard error, Spread sheets
4. Depiction of data by graphical methods
5. t-Test
6. Regression and Correlation, precision and accuracy
7. ANOVA

References

1. Experimental Biochemistry-A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern
3. Enzyme Assays- A practical Approach: Eienthal, R and Dawson,M.I., IRL Press.
4. Biostatistics – Arora & Malhan, Himalaya Publishing House.



DSC – 1C
Semester – III: Paper-BS305 (Theory): BIOENERGETICS, BIOLOGICAL OXIDATIONS
AND ENZYMOLOGY
(4 Credits; 4Hr/week)

Credit- I : Bioenergetics

1. Laws of thermodynamics
2. Energy transformations in the living system
3. Free energy, Enthalpy and Entropy concepts.
4. Exergonic and endergonic reactions.
5. High energy compounds, Substrate level phosphorylation
6. Phosphate group transfer potential.
7. Cytochromes-structure, types and their functions

Credit – II: Biological Oxidations

1. Biological oxidations: Definition, enzymes involved- oxidases, dehydrogenases and oxygenases.
2. Redox reactions. Redox couplers. Reduction potential (ϵ , ϵ_0 , ϵ'_0). Standard reduction potential (ϵ'^0) of some biochemically important half reactions.
3. Ultrastructure of mitochondria, Electron transport chain (ETC) and carriers involved.
4. Oxidative phosphorylation, theories of oxidative phosphorylation- Mitchell's chemiosmotic theory. $F_0 F_1$ - ATPase, Inhibitors of ETC and oxidative phosphorylation, uncouplers.
5. Formation of reactive oxygen species and their disposal through enzymatic reactions.
6. Ultrastructure and functions of chloroplast
7. Cyclic and non-cyclic photophosphorylation.

Credit- III : Introduction to Enzymology

1. Introduction to biocatalysis, differences between chemical and biological catalysis.
2. Principles of energy of activation, transition state
3. Nomenclature and classification of enzymes.
4. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor, Fundamentals of enzyme assay, enzyme units.
5. Enzyme specificity. Active site.
6. Interaction between enzyme and substrate- lock and key, induced fit models.
7. Methods of Enzyme purification

Credit – IV: Enzyme Kinetics and Enzyme action

1. Rate of a Reaction – Law of Mass action, Factors affecting the catalysis- substrate concentration, pH, temperature, Time, Enzyme concentration and Product concentration
2. Michaelis - Menten equation for single substrate reaction, significance of K_M and V_{max} .
3. Enzyme inhibition- irreversible and reversible, types of reversible inhibitions- competitive and non-competitive.
4. Outline of mechanism of enzyme action- acid-base catalysis, covalent catalysis, electrostatic catalysis, and metal ion catalysis.
5. Regulation of enzyme activity- allosterism and co-operativity. ATCase as an allosteric enzyme
6. Zymogen activation- activation of trypsinogen and chymotrypsinogen.
7. Isoenzymes (LDH) and Multienzyme complexes (PDH). Ribozyme.



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References:

1. Lehninger's Principles of Biochemistry – Nelson.D.L. and Cox.M.M., Freeman & Co.
2. Biochemistry – Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co.
3. Biochemistry – Voet.D and Voet., J.G., John Wiley & Sons
4. Textbook of Biochemistry – West.E.S., Todd.W.R, Mason.H.S..and. Bruggen, J.T.V., Oxford & IBH Publishers.
5. Outlines of Biochemistry – Conn.E.E., Stumpf.P.K., Bruening, G and Doi.R.H., John Wiley & Sons .
6. Harper's Illustrated Biochemistry – Murray, R.K., Granner.D.K. & Rodwell, V.W., McGraw-Hill
7. Biochemistry-Lippincott's Illustrated Reviews. Champe, P.C. and Harvey, R. A. Lippincott
8. Fundamentals of Biochemistry – Jain, J.L., Jain, S., Jain, N. S. Chand & Co.
9. Biochemistry – Satyanarayana. U and Chakrapani. U, Books & Allied Pvt. Ltd.
10. Fundamentals of Enzymology – Price.N.C.and Stevens.L., Oxford University Press.
11. Understanding Enzymes – Palmer.T., Ellis Harwood.
12. Enzymes – Biochemistry, Biotechnology, Clinical Chemistry – Palmer.T., Affiliated East-West Press



DSC – 1C
Semester – III: Paper-BS305 (Practicals): ENZYMOLOGY
(1 Credits; 2Hr/week)

1. Assay of salivary α -amylase
2. Assay of β -amylase from sweet potatoes
3. Assay of urease
4. Assay of phosphatase
5. Determination of optimum temperature for amylase
6. Determination of optimum pH for amylase
7. Effect of Substrate concentration of amylase activity

References

1. Experimental Biochemistry-A student companion-BeeduSashidharRao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern
3. Enzyme Assays- A practical Approach: Eisenthal, R and Dawson,M.I., IRL Press.
4. Biochemical Methods- Sadasivam,S and Manickyam,A. New Age International Publishers.



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SEMESTER-IV

SEC - 3

Semester – III: Paper BS 401: APPLIED AND COMPUTATIONAL BIOCHEMISTRY (2 Credits; 2 Hr/week)

Credit – I: Enzyme and Protein purification methods

1. Homogenization techniques
2. Centrifugation methods
3. Ammonium sulfate precipitation and Dialysis
4. Column chromatography and determination of molecular weight
5. UV-Vis spectrophotometry
6. Native PAGE
7. SDS-PAGE

Credit-II: Computational Biochemistry

1. Introduction to Computational Science and applications
2. Software packages used in Docking studies
3. Principles of molecular modeling-Drug designing
4. Drug-Biomolecule, Receptor-Biomolecule interactions
5. Applications in Enzyme Kinetics (K_m & V_{max})
6. Metabolic databases (KEGG)
7. Gene identification, Protein Data Bank

References:

1. An Introduction to Computational Biochemistry by C. Stan Tsai, A JOHN WILEY & SONS, INC., PUBLICATION
2. Computational Biochemistry and Biophysics by Oren M. Becker, Alexander D. MacKerell Jr., Benoit Roux, Masakatsu Watanabe. CRC Press, Taylor & Francis Group.
3. Applied Biochemistry and Bioengineering by Lemuel Wingard, JR., Ephraim Katchalski-Katzir and Leon Goldstein, Academic Press Inc.
4. Protein purification – Principles and practice by Robert K. Scopes, Springer-verlag
5. Protein purification – Principles, High resolution methods and applications by Jan-Christer Janson, Wiley
6. Enzyme purification and related techniques, Vol 22, Nathan KaplanNathan Colowick, Elsevier



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DSC – 1 D
Semester – IV: Paper-BS405 (Theory): INTERMEDIARY METABOLISM
(4 Credits; 4Hr/week)

Credit-I : Amino acid Metabolism

1. General reactions of amino acid metabolism- transamination, decarboxylation and deamination
2. Urea cycle and regulation
3. Catabolism of carbon skeleton of amino acids- glycolytic and ketogenic amino acids.
4. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine.
5. Biosynthesis of creatine.
6. Inborn errors of aromatic amino acids
7. Inborn errors of branched chain amino acid metabolism.

Credit- II : Carbohydrate Metabolism

1. Glycolysis, energy yield. Fate of pyruvate - formation of lactate and ethanol
2. Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions.
3. Glycogenolysis and glycogenesis.
4. Pentose phosphate pathway.
5. Gluconeogenesis.
6. Photosynthesis- Light and Dark reactions, Calvin cycle and C₄ Pathway. CAM Pathway
7. Metabolic disorders of carbohydrates – Galactosemia and Pentosuria

Credit – III: Lipid Metabolism

1. Catabolism of fatty acids (β - oxidation) with even and odd number of carbon atoms, Ketogenesis
2. *de novo* synthesis of fatty acids
3. Elongation of fatty acids in mitochondria and microsomes
4. Biosynthesis and degradation of triacylglycerol
5. Biosynthesis of lecithin.
6. Biosynthesis of cholesterol
7. Metabolic disorders of lipid metabolism – Nieman-pick disease and Fabry's disease

Credit – IV : Nucleic acid Metabolism

1. Biosynthesis of purine and pyrimidine nucleotides, *de novo* and salvage pathways.
2. Regulation of purine and pyrimidine nucleotides
3. Catabolism of purines and pyrimidines.
4. Biosynthesis of deoxyribonucleotides- ribonucleotide reductase and thymidylate synthase and their significance.
5. Disorders of nucleotide metabolism- Gout, Lesch- Nyhan syndrome.
6. Biosynthesis of heme
7. Degradation of heme



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References

1. Lehninger's Principles of Biochemistry – Nelson.D.L. and Cox.M.M., Freeman & Co.
2. Biochemistry – Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co.
3. Biochemistry – Voet.D and Voet., J.G., John Wiley & Sons .
4. Textbook of Biochemistry – West.E.S.,Todd.W.R,Mason.H.S..and. Bruggen, J.T.V., Oxford & IBH Publishers.
5. Principles of Biochemistry: General Aspects-Smith, E. L., Hill, R.L. Lehman, I. R. Lefkowitz, R.J. Handler, P., and White, A. McGraw-Hill
6. Outlines of Biochemistry – Conn.E.E.,Stumpf.P.K., Bruening, G and Doi.R.H.. John Wiley & Sons .
7. Harper's Illustrated Biochemistry – Murray, R.K., Granner.D.K. &Rodwell,V.W., McGraw-Hill
8. Biochemistry-Lippincott's Illustrated Reviews. Champe, P.C. and Harvey, R. A. Lippincott
8. Fundamentals of Biochemistry –Jain, J.L., Jain, S., Jain, N, S. Chand & Co.
9. Biochemistry – Satyanarayana. U and Chakrapani. U, Books & Allied Pvt. Ltd.
10. Biochemistry – Rama Rao. A and RatnaKumari. D, Kalyani Publishers.
11. Biochemistry- The Molecular Basis of Life – McKee. T and McKee, J. R. McGraw-Hill.



DSC – 1 D
Semester – IV: Paper-BS405 (Practicals): BIOCHEMICAL PREPARATIONS AND SEPARATIONS
(1 Credits; 2Hr/week)

1. Isolation of egg albumin from egg white.
2. Isolation of cholesterol from egg yolk.
3. Isolation of starch from potatoes.
4. Isolation of casein from milk.
5. Separation of amino acids by Paper chromatography
6. Separation of Plant pigments by TLC
7. Absorption maxima of colored substances- *p*-Nitrophenol, Methyl orange, BSA and DNA

References

1. Experimental Biochemistry-A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern



Semester - V

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Semester – V: Paper – BS 501: Biochemistry and Physiology (4 Credits; 4 Hr/week)

Credit – I: Biomolecules

1. Water properties, pH and Buffers
2. Carbohydrates – Classification (mono, di, oligo and poly), properties and importance
3. Amino acids – Classification, properties and importance. Structure of proteins.
4. Lipids – Classification, properties and importance
5. Nucleic acids – Purines, Pyrimidines, Nucleosides, Nucleotides. Structure and types of DNA and RNA and denaturation
6. Enzymes – Classification, Factors affecting enzyme activity, Clinically important enzymes (SGOT, SGPT, LDH and CPK)
7. Vitamins (Fat soluble and water soluble) and Trace elements

Credit – II: Metabolism

1. Amino acid metabolism – General reactions, metabolism of aromatic amino acids
2. Carbohydrate metabolism – Glycolysis and TCA cycle
3. Gluconeogenesis and Glycogen metabolism
4. Lipid metabolism - β -oxidation of fatty acids
5. De novo synthesis of fatty acids
6. Nucleic acid metabolism – Synthesis and degradation of purines and pyrimidines
7. Metabolic disorders

Credit – III: Physiology

1. Physiology of digestion
2. Physiology of vision
3. Physiology of muscle
4. Physiology of nerve and mechanism of nerve impulse transmission
5. Composition of blood and blood coagulation
6. Structure of heart and cardiac cycle
7. Factors controlling blood pressure

Credit – IV: Endocrinology

1. Introduction to Endocrinology and Organization of endocrine system
2. Hormones of Hypothalamus
3. Hormones of Pituitary
4. Hormones of Thyroid and Clinical Relevance
5. Hormones of Pancreas and Clinical Relevance
6. Hormones of Adrenal gland
7. Hormones of Gonads

References

1. Lehninger's Principles of Biochemistry – Nelson.D.L. and Cox.M.M., Freeman & Co.
2. Biochemistry – Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co.
3. Biochemistry – Voet.D and Voet., J.G., John Wiley & Sons
4. Textbook of Biochemistry – West.E.S., Todd.W.R, Mason.H.S. and Bruggen, J.T.V., Oxford & IBH Publishers.
5. Principles of Biochemistry: General Aspects-Smith, E. L., Hill, R.L. Lehman, I. R. Lefkowitz. R.J. Handler, P., and White, A. McGraw-Hill
6. Outlines of Biochemistry – Conn.E.E., Stumpf.P.K., Bruening, G and Doi.R.H., John Wiley & Sons .
7. Harper's Illustrated Biochemistry – Murray, R.K., Granner.D.K. & Rodwell, V.W., McGraw-Hill
8. Biochemistry-Lippincott's Illustrated Reviews. Champe, P.C. and Harvey, R. A. Lippincott
8. Textbook of Biochemistry and Human Biology – Talwar, G.P. and Srivastava. L.M., Printice Hall of India
9. Human Physiology – Chatterjee.C.C, Medical Allied Agency
10. William's Textbook of Endocrinology – Larsen, R. P. Korenberg, H. N. Melmed, S. and Polensky, K. S. Saunders
11. Lehninger's Principles of Biochemistry – Nelson.D.L. and Cox.M.M., Freeman & Co.
12. Biochemistry – Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co
13. Fundamentals of Biochemistry –Jain, J.L., Jain, S., Jain, N. S. Chand & Co.

DSC – I E
Semester – V: Paper-BS 504 A (Theory) : Physiology, Nutrition and Clinical Biochemistry
(4 Credits; 4Hr/week)

Credit-I: Physiology

1. Digestion and absorption of carbohydrates, lipids and proteins
2. Composition of blood and coagulation of blood
3. Hemoglobin and transport of gases in blood (oxygen and CO₂)
4. Heart- structure of the heart, Cardiac cycle, cardiac factors controlling blood pressure
5. Physiology of Vision
6. Muscle- kinds of muscles, structure of myofibril, organization of contractile proteins and mechanism of muscle contraction.
7. Structure of Neuron and propagation of nerve impulse

Credit-II: Endocrinology

1. Endocrinology- organization of endocrine system. Classification of hormones.
2. Mechanism of hormonal action- Steroid and peptide hormones such as adrenaline, glucocorticoids and insulin.
3. Chemistry, physiological role and disorders of hormones of Pituitary, Hypothalamus and Thyroid
4. Chemistry, physiological role and disorders of hormones of Pancreas
5. Chemistry, physiological role and disorders of hormones of Parathyroid
6. Chemistry, physiological role and disorders of hormones of Gonads, Placenta and Adrenals
7. Gastrointestinal hormones and their physiological role

Credit – III: Nutrition

1. Balanced diet. Calorific values of foods and their determination by bomb calorimeter.
2. BMR and factors affecting BMR. Specific dynamic action of foods.
3. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women.
4. Sources of complete and incomplete proteins. Biological value of proteins. Role of essential fatty acids in human nutrition.
5. Malnutrition- Kwashiorkar, Marasmus and PEM.
6. Vitamins- sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins; Bulk and trace elements-Ca, Mg, Fe, I, Cu, Mo, Zn, Se and F.
7. Nutraceuticals; Obesity and starvation.

Credit-IV: Clinical Biochemistry and Organ Function tests

1. Structure and functions of the liver, Liver function tests- conjugated and total bilirubin in serum, albumin: globulin ratio, hippuric acid and bromsulphthalein tests. Serum enzymes in liver diseases- SGPT, GGT and alkaline phosphatase.
2. Kidneys-structure of nephron and Mechanism of urine formation, Normal and abnormal constituents of urine
3. Biological buffers. Role of kidneys in maintaining acid-base and electrolyte balance in the body.
4. Renal function tests- creatinine and urea clearance tests, phenol red test.
5. Biochemical tests for the diagnosis of heart diseases- HDL/LDL cholesterol, SGOT, LDH, CK, C-reactive protein, cardiac troponins.
6. Brain function tests - EEG
7. GI tract test - Endoscopy

References

1. Textbook of Biochemistry and Human Biology – Talwar, G.P. and Srivastava. L.M., Printice Hall of India
2. Review of Medical Physiology-Ganong, McGraw-Hill.
3. Human Physiology – Chatterjee.C.C, Medical Allied Agency
4. Textbook of Medical Physiology – Guyton.A.G and Hall.J.E., Saunders
5. William’s Textbook of Endocrinology – Larsen, R. P. Korenberg, H. N. Melmed. S. and Polensky, K. S. Saunders
6. Mammalian Biochemistry- White, A. Handler, P. and Smith, E. L. McGraw-Hill.
7. Textbook of Human Nutrition- Bamji, PralhadRaoand Reddy V. Oxford & IBH Publishers.
8. Foods: Facts & Principle- Shakuntala andShadaksharaswamy. Wiley Ester Press.
9. Essentials of Food and Nutrition – Swaminathan.M. Bangalore Press.
10. Human Nutrition and Dietetics. Davidson, S. and Passmore, J. R. ELBS.
11. A Textbook of Biochemistry: Molecular and Clinical Aspects. Nagini, S. Scitech Publishers.
12. *Tietz* Fundamentals of Clinical Chemistry- Burtis, A. A. and Ashwood, E. R. Saunders-imprint Elsevier Pub.
13. Textbook of Biochemistry with Clinical Correlations – Devlin.T.M.,Wiley – Liss
14. Textbook of Medical Biochemistry – Chatterjea.M.N. and Shinde.R, Jaypee Brothers Medical Publishers.
15. Textbook of Medical Biochemistry- Ramakrishnan, S., Prasannan, K. G. and Rajan, R. Orient Longman
16. Essentials of Food and Nutrition –Swaminathan M. Bangalore Press

DSC – 1E
Semester – V: Paper - BS 504 A (Practicals): Physiology, Nutrition and Clinical
Biochemistry
(1 Credits; 2Hr/week)

1. Estimation of hemoglobin in blood, Total count and Differential count – RBC and WBC
2. Urine analysis for albumin, sugars and ketone bodies.
3. Estimation of urinary creatinine.
4. Estimation of total serum cholesterol.
5. Estimation of vitamin C by 2, 6 - DCPIP method.
6. Determination of iodine value of oil.
7. Determination of peroxide value of oil.

References

1. Experimental Biochemistry-A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern
3. Biochemical Methods- Sadasivam,S and Manickyam,A. New Age International Publishers

DSC – 1 E

Semester – V: Paper-BS 504 B (Theory): Cell Biology, Genetics and Microbiology (4 Credits; 4Hr/week)

Credit – I: Cell Biology

1. Cell as basic unit of living organisms; Ultra-structure of prokaryotic cell and eukaryotic cell
2. Composition & functions of cell organelles
3. Cytoskeleton- Microfilaments, Microtubules & Intermediate filaments
4. Chromosome organization in Prokaryotes and Eukaryotes and structure of chromosomes (Polytene and Lamp Brush)
5. Cell cycle
6. Mitosis and Meiosis
7. Cell death – Apoptosis and Necrosis

Credit – II: Genetics

1. Basic concepts of Genetics - Mendel's laws
2. Non-Mendelian inheritance: Extra chromosomal inheritance (*Paramoecium* & *Drosophila*).
3. Partial or incomplete dominance and Co-dominance
4. Maternal inheritance (Coiling in snails, Leber's hereditary optic neuropathy (LHON)).
5. Polygenic inheritance (Introduction to quantitative traits).
6. Sex linked inheritance. X-linked recessive inheritance (colour blindness & Hemophilia). Concept of Autosomal recessive and dominant inheritance
7. Linkage and recombination

Credit – III: Mutations and Mutagens

1. Mutations (spontaneous / induced, somatic / germinal, forward / reverse, transition / transversions)
2. Mutations (Silent, missense, nonsense, and frame shift mutations, conditional, leaky)
3. Detection, selection & isolation of microbial mutants
4. Estimation of mutation rates
5. Reversion and suppression of mutations
6. Mutagens – physical, chemical
7. Transposon mutagenesis, site-directed mutagenesis

Credit – IV : Microbiology

1. Introduction to brief history of microbiology. Classification of microorganisms, Mycoplasma.
2. Motility and sporulation
3. Isolation and cultivation of bacteria. Selective media and enriched media. Gram's staining
4. Bacterial growth curve and kinetics of growth. Batch, continuous and synchronous cultures.
5. Industrial uses of *Aspergillus niger*, yeast and Spirulina.
6. Structure and composition of viruses. One-step growth and determination of plaque forming units (PFU).
7. Viral life cycles – T4 (Lytic), λ phage (lytic and lysogenic), TMV, Retro viruses- HIV.

References

1. Principles of Genetics by Eldon John Gardner, Michael J. Simmons, D. Peter Snustad; John Wiley
2. Modern Genetic Analysis Anthony JF Griffiths, William M Gilbert, Jeffrey H Miller, and Richard C Lewontin. Pub. W. H. Freeman
3. Lewin B. (Ed) (1996) Genes, VII edition, John Wiley and Sons, New York.
4. Cell and Molecular Biology, De Robertis and De Robertis, Lippincott & Wilkins
5. Cell Biology by C. B. Pawar
6. Principles of Genetics by R.H. Tamarin McGrawhill
7. Theory & problems in Genetics by Stansfield, Schaum out line series McGrawhill
8. Textbook of Microbiology – Ananthanarayan, R and JayaramPaniker, C.K., Orient Longman.
9. Microbiology – Prescott.L.M.,Harley.J.P. & Klein.D.A, McGraw-Hill.
10. Microbiology – Pelczar Jr.,M.J., Chan.E.C.S. and Krieg.N.R., Tata McGraw-Hill.
11. Textbook of Microbiology- Dubey, R. C. and Maheshwari, D. K. S. Chand & Co.

DSE – 1 E
Semester – V: Paper-BS 504 B (Practicals): Cell Biology, Genetics and Microbiology
(1 Credits; 2Hr/week)

1. Preparation of different stages of Mitosis and Meiosis
2. Problems on Monohybrid cross, Problems on dihybrid ratio in *Drosophila*/maize, Linkage and Recombination, Sex linked inheritance and X-linked recessive inheritance
3. Sterilization methods and preparation of culture media, Isolation of pure cultures: (i) Streak plate method (ii) Serial dilution method.
4. Gram staining.
5. Motility of bacteria by hanging drop method.
6. Bacterial growth curve.
7. Antibiotic sensitivity by paper disc method.

References

1. Essential practical handbook of Cell Biology & Genetics, Biometry and Microbiology: A Laboratory Manual by Debarati Das, Academic Publishers
2. Microbiology – A Laboratory manual by Cappuccino and Sherman, Pearson Publications LPE.
3. Experiments in Microbiology, Plant Pathology and Biotechnology by Aneja A. R., New Age Publications

Semester – VI

DSE – 1 F

Semester – VI: Paper-BS 603 A (Theory): Molecular Biology and Immunology (4 Credits; 4Hr/week)

Credit- I : DNA Replication

1. Experimental evidences to prove DNA as genetic material.
2. Nature and structure of the gene.
3. DNA replication- models of replication, Meselson-Stahl's experimental proof for semi-conservative model.
4. Replication in prokaryotes - DNA polymerases I, II and III of *E.coli*, helicase, topoisomerases, primase, ligase.
5. Bidirectional replication model. Okazaki fragments, leading and lagging strands of DNA synthesis.
6. Replication in Eukaryotes
7. Inhibitors of DNA replication.

Credit- II : Transcription and Translation

1. Transcription - RNA synthesis, RNA polymerases of prokaryotes and eukaryotes
2. Initiation, Elongation and Termination- rho dependent and rho independent.
3. Post-transcriptional modifications and Inhibitors of RNA synthesis.
4. Genetic code, Deciphering of genetic code, Nirenberg's and Khorana's experiments, wobble hypothesis, degeneracy of genetic code.
5. Protein synthesis- structure of t-RNA activation of amino acids (aminoacyl t-RNA synthetases). Ribosome structure
6. Initiation, elongation and termination of protein synthesis. Post- translational modifications and Inhibitors of protein synthesis.
7. Regulation of prokaryotic gene expression- induction and repression. Lac operon

Credit – III: Immunology

1. Organization of immune system.
2. Organs and cells of immune system.
3. Innate and acquired immunity.
4. Cell mediated and humoral immunity (T- and B- cells).
5. Classification of immunoglobulins, structure of IgG. Theories of antibody formation- clonal selection theory.
6. Epitopes / antigenic determinants. Concept of haptens. Adjuvants.
7. Monoclonal antibodies and their applications

Credit – IV: Immunotechnology

1. Antigen-antibody reactions- agglutination, immunoprecipitation, immunodiffusion.
2. Blood group antigens.
3. Immunodiagnosics-RIA, ELISA.
4. Vaccines and their classification, Traditional vaccines
5. Modern vaccines- recombinant and peptide vaccines.
6. Outlines of hypersensitivity reactions.
7. Fundamentals of graft rejection and MHC proteins.

References

1. Molecular Biology of Cell- Alberts, B. Bray, D. Lewis, J. Raff, M. Roberts, K. and Watson, J. D. Garland Publishing.
2. Recombinant DNA and Biotechnology: A Guide for teachers- Helen and Massey. ASM Press.
3. Genes VIII – Lewin. B, Oxford University Press .
4. Molecular Biology- Freifelder. D. Naroasa Pub. House
5. Molecular Biology of the Gene- Watson. J.D., Baker, T.A, Bell, S.P., Gann.A, Levine, M and Losick.R, Pearson Education.
6. Molecular Biotechnology- Glick, B. R. and Pasternak, J. J. ASM Press
7. Principles of Gene Manipulation: An Introduction to GE- Old, R. V. and Primrose, S. B. Blackwell Sci. Pub.
8. Molecular Cell Biology- Lodish, H., Berk, A., Matsudaira, P., Kaiser, C. A., Krieger, M. Scott M P., Zipursky, S. L. and Darnell, J. Freeman & Co.
9. Immunology. Tizard, I. R. Thomson Press.
10. Kuby Immunology – Kindt.T.J., Goldsby.R.A. and Osborne.B.A., Freeman & Co.
11. Roitt's Essential Immunology – Roitt.I.M. and Delves.P.J., Blackwell Science.

DSE – 1 F
Semester – VI: Paper - BS 603 A (Practicals) : Molecular Biology and Immunology
(1 Credits; 2Hr/week)

1. Isolation of DNA from onion/Plasmids
2. Determination of purity of nucleic acids by UV-spectrophotometric method.
3. Estimation of DNA by diphenylamine method.
4. Estimation of RNA by orcinol method.
5. Electrophoresis of nucleic acids and visualization by ethidium bromide staining.
6. Agglutination: A, B, AB and O blood groups and Rh
7. ODD and Sandwich ELISA

References

1. Experimental Biochemistry-A student companion-Beedu Sashidhar Rao and Vijay Deshpande.
2. Laboratory Manual in Biochemistry- Jayaraman, J. Wiley Eastern
3. Biochemical Methods- Sadasivam,S and Manickyam,A. New Age International Publishers

DSE – I F
Semester – VI: Paper-BS 603 B (Theory): r-DNA technology and Biotechnology
(4 Credits; 4Hr/week)

Credit – I: r-DNA technology I

1. Cloning strategies.
2. Tools of r-DNA technology: Enzymes- Restriction endonucleases and ligases
3. Restriction mapping.
4. Polymerase chain reaction- principle and applications
5. Outlines of blotting techniques-Southern, Northern and Western
6. Molecular markers–RFLP,AFLP and RAPD
7. DNA sequencing- Maxam Gilbert and Sanger's methods

Credit – II: r-DNA technology II

1. Construction of c-DNA libraries.
2. Cloning vectors- Plasmids, Cosmids, and λ phages
3. Hosts- *E.coli*
4. Applications of gene cloning- production of insulin
5. Production of human growth hormone
6. Production of *Bt* cotton
7. Edible vaccines.

Credit – III: Plant and Animal Biotechnology

1. Plant tissue culture and its applications
2. Plants as bioreactors and valuable chemical factories (production of bioactive compounds)
3. Transgenic plants, Crop improvement, Production of herbicide and insect resistant plants
4. Genetically modified crops – Arabidopsis, Golden rice, soybeans, Bt cotton, tobacco, potato, papaya, jatropha,
5. Animal cell cultures and its applications.
6. Animal cells as bioreactors. Molecular pharming; Production of vaccines, pharmaceutical proteins, recombinant hemoglobin and blood substitutes
7. Transgenic animals

Credit – IV: Microbial and Environmental Biotechnology

1. Microbes as biocontrol agents, Microbial insecticides (Baculoviruses, *Bacillus thuringiensis* and *Bacillus sphaericus*)
2. Bioremediation, Biodegradation of cellulose and lignocellulose, bio-surfactants and bio-emulsifiers
3. Microbial ore leaching and production of microbial fuels (hydrogen, methane)
4. Renewable and Non-renewable energy sources
5. Strategies involved in Municipal solid waste treatment, Treatment of industrial and domestic effluent (aerobic and anaerobic)
6. Biomaterials as an alternative to non-degradable materials. Heavy Metal Accumulation. Biosorption.
7. Heavy metal tolerance (including mechanism) and its impact on environment

References

1. Principles of Gene Manipulation: An introduction to GE – Old, R. and Primrose, S.B. Blackwell Sci. Pub
2. Molecular Biotechnology Glick, BR and Paternak, JJ. Publish ASM Press
3. Introduction to Biotechnology, William J. Thieman, Michael A. Palladino, Benjamin Cummings Publ
4. Biotechnology- Arora, Himalaya pub. House
5. Introduction to Environmental Biotechnology by A. K. Chatterji, PHI Learning Pvt. Ltd.
6. Animal Cells as Bioreactors - By Terence Gatoright, Cambridge Univ Press
7. Text Book of Biotechnology - By H.K. Das (Wiley Publications)
8. Introduction to Plant Tissue Culture - By M.K. Razdan (Oxford and IBH Publishing Company, New Delhi)
9. Industrial Microbiology by L.E. Casida

DSE – 1 F

Semester – VI: Paper-BS 603 B (Practicals): r-DNA technology and Biotechnology (1 Credits; 2Hr/week)

1. Restriction mapping: λ -DNA with any two restriction enzymes; strategies of Gene cloning
2. Preparation and transformation of competent cells
3. Preparation of MS medium and initiation of callus, Micropropagation of plants
4. Isolation of microbes from environment (Any source : soil, water, skin, bread, milk)
5. Efficacy testing for bio-fertilizers (nodulation test for rhizobia) and Efficacy testing for bio-pesticides
6. Microbial degradation of organic matter, Municipal solid waste treatment and Waste water treatment
7. Production of hydrogen and methane

References

1. Molecular Cloning (Lab manual) by Maniatis T, Fritsch EF, Sambrook J, Volume -I, CSH
2. Microbial Biotechnology – A Laboratory Manual for bacterial systems by Das, Surajit, Dash, HirakRanjan, Springer-Verlag
3. Plant Tissue Culture by Kalyan Kumar De
4. Biogas Technology by b.T. Nijaguna
5. Biotechnology procedures and experiments handbook by S. Harisha, Infinity Science Press LLC.

Semester IV: Optional Paper in place of Project (Theory)
Biochemistry in health and disease
(4 Credits: 4 hrs/week)

Credit I. Metabolic disorders

1. Amino acid metabolism
2. Phenylketonuria, Alkaptonuria
3. Carbohydrate Metabolism
4. Galactosemia, Pentosuria
5. Nucleic acid metabolism
6. Gout, Lesch-Nyhan syndrome
7. Lipid Metabolism
8. Gaucher's disease, Tay-sachs disease

Credit II. Genetic disorders

1. Introduction to genetic diseases
2. Chromosomal disorders- Down syndrome, Turner syndrome
3. Hemoglobinopathies- Sickle cell anaemia
4. Thalassemia
5. Genetic counselling
6. Pre-natal diagnosis
7. Gene therapy

Credit III. Endocrine disorders

1. Introduction to endocrine disorders
2. Endocrine organs-
 - a) Pituitary glands
 - b) Thyroid gland
 - c) Parathyroid gland
 - d) Pancreas
 - e) Ovaries, Testis
 - f) Adrenal glands
3. Diabetes – Type I & II
4. Thyroidism
5. Polycystic Ovaries
6. Endometriosis
7. Contraceptives
8. Addison's and Cushing syndrome

Credit IV. Molecular Basis of Cancer

1. Chemical Carcinogens
2. Fundamental features of carcinogenesis
3. Oncogenes, Tumor suppressor genes causing cancer
4. Tumor biomarkers in bodily fluids.
5. Mechanism of carcinogenesis
6. New therapies in cancer
7. Epigenetic mechanism in cancer.

References:

1. Voets Principles of Biochemistry V Edition-2016 for Unit I & II.
2. Tietz Fundamentals of Clinical Chemistry-2010 for Unit III.
3. Harpers illustrated Biochemistry for Unit IV.

B.Sc., CBCS for all Universities in Telangana (wef 2019-2020)
B.Sc., BIOCHEMISTRY

MODEL PAPER: THEORY

For I & II Semesters

Duration 3 hours

Max. Marks 80

Section - A (Short Answer Type)
Answer any eight of the following questions

8 x 4 = 32 Marks

1. Credit-I
2. ..
3. ..
4. Credit-II
5. ..
6. ..
7. Credit-III
8. ..
9. ..
10. Credit-IV
11. ..
12. ..

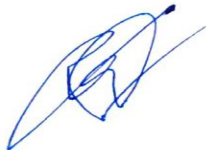
Section - B (Essay Answer Type)
Answer all Questions 4 x 12 = 48 Marks

9. (a) Credit-I
(OR)
(b) Credit-I

10. (a) Credit-II
(OR)
(b) Credit-II

11. (a) Credit-III
(OR)
(b) Credit-III

12. (a) Credit-IV
(OR)
(b) Credit-IV



MODEL PAPER PRACTICALS

For V&VI Semesters

Duration: 3 hours

Max. Marks 50

- | | |
|---|------------|
| 1. Write the Principles for the following experiments | (10 Marks) |
| 2. Major Experiment | (20 Marks) |
| 3. Minor Experiment | (10 Marks) |
| 4. Viva-Voce and Record | (10 Marks) |

Participation of teachers in academic and personal counseling of students:

- ▶ The institution appoints one faculty member as class mentor for students entering newly into the college who helps the students to feel like a friendly environment and discusses their problems to adjust in the new environment and orients them to college practices, guides them throughout 3 years.
- ❖ Detail of faculty development programmes and teacher who have been benefited during the past five years

Name of the Lecturer	Title of the Course Attended	Organized by	Date
A CHANDRA SHEKHAR	RC in Life sciences	MAANUU Hyderabad	17-09-2020 to 30-09-2020
	ICT tools in Higher Education	Osmania University UGC HRDC & RUSA	20-08-2020 to 26-08-2020
	"Research process and Design"	Osmania University UGC HRDC & RUSA	07-09-2020 to 12-09-2020
	FDP on Soft Skills	Ramanujan College University of Delhi	25-10-2021 to 31-10-2021

Co curricular & extracurricular activities.

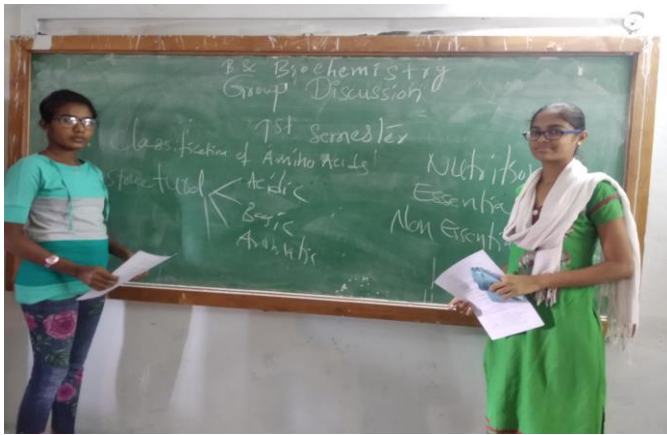
Co curricular activities:

- ❖ Mentor: Our staff, each individual take one particular group, and act as mentor , by counseling them in academic and personal matters to mould them in suitable to grab the opportunities in the form of jobs by imparting them guidance and training them in communication skills, analytical skills etc.
- ❖ Field trips: We arrange field trips to students to inculcate interest in the students to know the mechanism behind the power production, transmission etc.
- ❖ Study Projects: We give study projects to the students which make them to do authentic research, analyze data and draw conclusions
- ❖ We are conducting different tests like slip test exams to evaluate the students.
- ❖ We are encouraging the students to attend the seminars, workshops conducted by other departments to expose them to different disciplines.

Extracurricular activities:

Encourage and involve students to participate in NSS, NCC, Cultural activities, Quiz, Elocution, Readers forum membership, film club membership, clean and green programme, students participation in seminars, group discussions for personality development.





STUDENT STUDY PROJECTS:

We have given study projects to the students.

List of students STUDY PROJECT 2018-19.	
Sl.No	Name
1	Athika Ummul Khair
2	Gatla Madhuri
3	K Madhumitha

List of students STUDY PROJECT 2019-20.	
Sl.No	Name
1	Mora Shivani
2	Hajra Asma

List of students STUDY PROJECT 2020-21.	
Sl.No	Name
1	Afsha Fathima
2	Pravallika Priya Kumari
3	Pandrala Sripriya

Student achievements:

Name of the student enrolling into higher education	Programme graduated from	Name of the institution joined	Name of programme admitted to
Gatla Madhuri(2019)	B.Sc(Biochemistry)	Mahatma Gandhi university campus	M.Sc. Biochemistry
K Madhumitha(2019)	B.Sc(Biochemistry)	Mahatma Gandhi university campus	M.Sc. Biochemistry
Mora shivani (2020)	B.Sc(Biochemistry)	Hyderabad central university	M.Sc. Biochemistry
Janapathi pravallika priya kumara(2021)	B.Sc(Biochemistry)	Mahatma Gandhi university campus	M.Sc. Biochemistry
Pandrala sripriya(2021)	B.Sc(Biochemistry)	Osmania university campus	M.Sc. Environmental science

Future plans of the department

- ▶ Faculty members are planning to apply for minor research projects.
- ▶ Planning to encourage students to participate in Diabetes, Nutritional awareness campaign in nearby villages.
- ▶ To arrange more extension lectures by eminent subject experts
- ▶ Encourage advanced learners for research and project works so they can improve knowledge and get motivated for higher studies

BIO-DATA OF FACULTY

- | | | |
|-------------------------------------|---|--|
| 1. Name with surname | : | ANUGULA CHANDRA SHEKHAR |
| 2. Date of Birth & Age | : | 18-01-1984 |
| 3. Gender | : | M |
| 4. Permanent Address | : | |
| | | H.No.- 2-41/4
Seetharampur
Karimnagar. |
| 5. Marital Status | : | Married |
| 6. No. of Children | : | 2 |
| 7. Educational Qualification | : | M.Sc Biochemistry

CSIR-UGC NET (PhD) |
| 8. Mode of Appointment | : | Direct |
| 9. Designation | : | Assistant Professor |
| 10. Scale of Pay (State/UGC) | : | UGC |
| 11. Date of Appointment | : | 26-12-2011 |
| 13. Date of joining in this college | : | 30-06-2018 |
| 14. Do you hold additional charge? | : | MOOCS Coordinator. |

Telangana State Council Of Higher Education, Govt. Of Telangana**B.Sc. CBCS Common Core Syllabi for All Universities in Telangana****B.Sc. Applied Nutrition and Public Health**

FIRST YEAR SEMESTER I				
CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
BS101	ENVIRONMENTAL STUDIES	AECC I	2	2
BS102	ENGLISH	CC- I A	4	4
BS103	SECOND LANGUAGE	CC -2 A	4	4
BS104	BASICS OF BIOCHEMISTRY	DSC- 1A	4T+2P=6	4+1=5
BS105	OPTIONAL II	DSC -2A	4T+2P=6	4+1=5
BS 106	OPTIONAL III	DSC- 3A	4T+2P=6	4+1=5
	TOTAL			25
SEMESTER II				
BS 201	GENDER SENSITIZATION	AECC 2	2	2
BS 202	ENGLISH	CC- I B	4	4
BS 203	SECOND LANGUAGE	CC -2 B	4	4
BS 204	NUTRITIONAL BIOCHEMISTRY	DSC- IB	4T+2P=6	4+1=5
BS 205	OPTIONALII	DSC- 2B	4T+2P=6	4+1=5
BS 206	OPTIONAL III	DSC- 3B	4T+2P=6	4+1=5
	TOTAL			25
SECOND YEAR SEMESTER III				
BS 301	FOOD SERVICE MANAGEMENT	SEC - I	2	2
BS 302	UGC - FRAMED SYLLABUS	SEC - II	2	2
BS 303	ENGLISH	CC- IC	3	3
BS 304	SECOND LANGUAGE	CC -2C	3	3
BS 305	FOOD SCIENCE & TECHNOLOGY	DSC - IC	4T+2P=6	4+1=5
BS 306	OPTIONAL- II	DSC- 2C	4T+2P=6	4+1=5
BS 307	OPTIONAL- III	DSC- 3C	4T+2P=6	4+1=5
	TOTAL			25
SEMESTER IV				
BS 401	QUANTITY FOOD PRODUCTION	SEC - 3	2	2
BS 402	UGC - FRAMED SYLLABUS	SEC - 4	2	2
BS 403	ENGLISH	CC- I D	3	3
BS 404	SECOND LANGUAGE	CC -2 D	3	3
BS 405	FAMILY & COMMUNITY NUTRITION	DSC - 1D	4T+2P=6	4+1=5
BS 406	OPTIONAL- II	DSC- 2D	4T+2P=6	4+1=5
BS 407	OPTIONAL- III	DSC- 3D	4T+2P=6	4+1=5
	TOTAL			25
THIRD YEAR SEMESTER V				
BS 501	ENGLISH	CC-1 E	3	3
BS 502	SECOND LANGUAGE	CC-2E	3	3
BS 503	FUNDAMENTALS OF FOOD & NUTRITION	GE	4	4
BS 504	A) CLINICAL DIETETICS (OR) B) FOOD SAFETY & QUALITY CONTROL	DSE-1E	4T+2P=6	4+1=5

Dr. Bhanoori Manjula, Ph.D.
Chairman
Board of Studies, Nutrition
Osmania University
Hyderabad.

HEAD
Department of Biochemistry
University College of Science
Osmania University

BS 505	OPTIONAL II A/B/C	DSE – 2E	4T+2P=6	4+1=5
BS 506	OPTIONAL II A/B/C	DSE – 3E	4T+2P=5	4+1=5
	TOTAL			25
SEMESTER- VI				
BS 601	ENGLISH	CC-1F	3	3
BS 602	SECOND LANGUAGE	CC-2F	3	3
BS 603	A) PUBLIC HEALTH, FOOD HYGIENE & SANITATION (OR) B) NUTRITION THERAPY IN CRITICAL CONDITIONS	DSE – 1F	4T+2P=6	4+1=5
BS 604	OPTIONAL II A/B/C	DSE – 2F	4T+2P=6	4+1=5
BS 605	OPTIONAL II A/B/C	DSE – 3F	4T+2P=6	4+1=5
BS 606	PROJECT WORK / ADVANCED NUTRITION		4	4
	TOTAL			25
	TOTAL CREDITS			150

CC-Core Course

AECC- Ability Enhancement Compulsory Course

DSC- Discipline Specific Course

SEC- Skill Enhancement Course


DSE- Discipline Specific Elective


GE- General Elective

HPW- Hours per Week

P- Practical

T- Theory

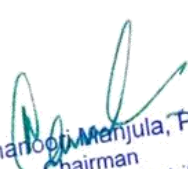

Dr. Bhandoori Manjula, Ph.D.
Chairman
Board of Studies, Nutrition
Osmania University
Hyderabad.


HEAD
Department of Biochemistry
University College of Science
Osmania University



Telangana State Council of Higher Education, Govt. of Telangana
B.Sc. CBCS Common Core Syllabi for All Universities in Telangana
Proposed scheme for choice-based credit system in B. Sc. Applied Nutrition
and Public Health

S.NO	COURSE CATEGORY	NO.OF COURSES	CREDITS PER COURSE	CREDITS
1.	AECC	2	2	4
2.	SEC	4	2	8
3.	CC	2	4 (I Year), 3 (II Year), 3 (III Year)	40
4.	DSC	20	5	60
6.	DSE	10	5	30
7.	GE	1	4	4
8.	PROJECT WORK/ CORE PAPER	1	4	4
	TOTAL	37		150
	CREDITS UNDER NON CGPA			
	NSS / NCC/ SPORTS/ EXTRA CURRICULAR		UPTO 6 (2 IN EACH YEAR)	
	SUMMER INTERNSHIP		UPTO 4 (2 IN EACH YEAR)	


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BSC APPLIED NUTRITION & PUBLIC HEALTH I YEAR**I SEMESTER****BS104 DISCIPLINE SPECIFIC COURSE IA- (DSC IA)****BASICS OF BIOCHEMISTRY****CREDITS 4****60 HOURS****CREDIT I- INTRODUCTION TO NUTRITION & CARBOHYDRATES 16 Hours**

1.1 Introductory Nutrition, Definition of Nutrition, Food, Nutrients, or Proximate Principles, Nutritional needs of the body, specific role of nutrients, classification of foods, food groups.

1.2 **Carbohydrates** — Composition and chemistry, classification, sources, nutritional significance, digestion, absorption and metabolism - Glycolysis, TCA Cycle with bioenergetics.

CREDIT II- PROTEINS & NUCLEIC ACIDS**18 Hours**

2.1 **Proteins:** Composition and chemistry, classification sources, functions, digestion and absorption, denaturation. Nutritional significance of some amino acids. General properties of proteins, metabolism, deamination, transamination, decarboxylation. Outlines the supplementary value of amino acids. Deficiency of Protein — PEM definition, classification, and age groups affected

2.2 **Nucleic acids:** Composition — purine and pyrimidine bases DNA, RNA — structure and biological functions

CREDIT III- LIPIDS**14 Hours**

3.1 Composition Chemistry classification- simple, compound & derived lipids with functions, cholesterol functions & ranges

3.2 Sources, chemical properties.

3.3 Digestion and Absorption,

3.4 Essential fatty acids-omega3 & omega 6: functions and deficiency,

3.5 Elements of fat analysis, Metabolism: Beta- oxidation of fatty acids. Types of Rancidity, Ketosis

CREDIT IV-ENERGY METABOLISM**12 Hours**

4.1 Types of energy, energy-yielding food factors, RDA & factors affecting RDA, Units of energy

4.2 Principle of direct & indirect calorimetry

4.3 Determination of energy value of food using a bomb calorimeter.

4.4 PFV (Physiological Fuel Value) of foods, RQ, SDA of food.

4.5 Determination of BMR and factors affecting BMR.



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REFERENCE BOOKS

1. Nutrition science- B Srilakshmi, New age international publishers, 2nd edition.
2. A textbook of biochemistry, Dr AVSS Rama Rao, 10th edition, UBS publishers Distribution Pvt. Ltd.
3. Biochemistry- U Satyanarayana, U chakrapani, Books and Allied Pvt Ltd
4. Helen A. Guthrie, Introductory Nutrition, Times Mirror Mosby
5. Swaminathan M, Advance Textbook on Food and Nutrition, Volume 1, The Bangalore printing and publishing co.,Ltd.
6. Mudambi SR and Rajagopal M V, Fundamentals of food and Nutrition, Willey Eastern Ltd.
7. Swaminathan M, Handbook of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.

BSC APPLIED NUTRITION & PUBLIC HEALTH I YEAR

I -SEMESTER

BS104 DISCIPLINE SPECIFIC COURSE IA- (DSC IA)

BASICS OF BIOCHEMISTRY (Practical)

PERIODS: 15

NO. OF CREDIT-1

I. Introduction to Qualitative and Quantitative Analysis of Nutrients

II. Carbohydrates:

1. Qualitative analysis of Glucose
2. Qualitative analysis of Fructose
3. Qualitative analysis of Maltose
4. Qualitative analysis of Sucrose
5. Qualitative analysis of Lactose
6. Qualitative analysis of Starch

III. Proteins

I. Qualitative analysis of Proteins

IV. Minerals

I. Qualitative analysis of Minerals

FINAL PRACTICAL EXAMINATION
SEMESTER I
B.Sc.(CBCS) APPLIED NUTRITION AND PUBLIC HEALTH
PAPER-I BASICS OF BIOCHEMISTRY

BATCH: _____

DATE: _____

TIME: 3 HOURS

MARKS: 50 MARKS

MAJOR EXPERIMENT:

- I.** Analyse the given sample present in the test tube for the presence of Carbohydrates.
- a) Identify – mono, di and polysaccharides (5M)
 - b) Aim and Principal (5M)
 - c) Detailed procedure (5M)
 - d) Reporting (5M)
 - e) Osazone Crystals (slide preparation) (5M)

MINOR EXPERIMENT:

- II.** Analyse the given sample for the presence of any two of the following sample (15 M)
- a) Iron
 - b) calcium
 - c) phosphorus

(OR)

Analyse the given sample for the presence of protein (15M)

- III.** Write principal of any one of the following (5M)
- a) Molisch's test
 - b) Benedict's Test
 - c) Barfoed's Test
 - d) Iodine test
 - e) Seliwanoff's test

- IV.** Record (5M)

BSC APPLIED NUTRITION & PUBLIC HEALTH I YEAR**II SEMESTER****BS204 DISCIPLINE SPECIFIC COURSE IB- (DSC IB)****NUTRITIONAL BIOCHEMISTRY****CREDITS 4****60 HOURS****CREDIT I- VITAMINS****20 Hours**

1.1 Fat soluble — A, D, E, K. History, Chemistry, physiological functions, sources, requirements, effects of deficiency.

1.2 Water soluble vitamins — B Complex — Thiamine, Riboflavin, Niacin, Pantothenic Acid, Folic Acid, Vitamin B 12, Biotin and Pyridoxine, Vitamin C- History, requirements, functions, sources, effect of deficiencies.

CREDIT II - MINERALS**16 Hours**

2.1 Calcium, Phosphorous, Iron, Fluorine, Iodine. History, Chemistry, physiological functions, sources, requirements, deficiency.

2.2 Role of Zinc and Selenium as antioxidants.

CREDIT III-WATER BALANCE AND ELECTROLYTE BALANCE 12 Hours

3.1 Functions of water, water compartments in the body, distribution of water & electrolyte in the body. Regulation of water balance (overhydration & dehydration), regulation of electrolyte balance (hypo & hypernatremia, hypo & hyperkalemia), RAAS (Renin Angiotensin Aldosterone system), water intoxication

3.2, Acid-base balance & imbalance, Japanese Water Therapy.

CREDIT IV-ENZYMES & HORMONES**12 Hours**

4.1 **Enzymes** — Definition, classification, properties, mechanism of enzyme action, factors affecting enzyme action, enzyme inhibitions.

4.2 **Hormones** — Major endocrine glands and their secretions, classification, the general mode of action, functions, hypo & hypersecretion of — Insulin, Thyroxin, growth hormone, sex hormones.



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REFERENCE BOOKS

1. Nutrition science- B Srilakshmi, New age international publishers, 2nd edition.
2. A textbook of biochemistry, Dr AVSS Rama Rao, 10th edition, UBS publishers Distribution Pvt. Ltd.
3. Biochemistry- U Satyanarayana, U chakrapani, Books and Allied (Pvt.Ltd)
4. Helen A. Guthrie, Introductory Nutrition, Times Mirror Mosby
5. Swaminathan M, Advance Textbook on Food and Nutrition, Volume 1, The Bangalore printing and publishing co.,Ltd.
6. Mudambi SR and Rajagopal M V, Fundamentals of food and Nutrition, Willey Eastern Ltd.
7. Swaminathan M, Handbook of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.

BSC APPLIED NUTRITION & PUBLIC HEALTH I YEAR

II -SEMESTER

BS204 DISCIPLINE SPECIFIC COURSE IB- (DSC IB)

NUTRITIONAL BIOCHEMISTRY (PRACTICAL)

NO. OF HOURS 15

CREDITS-1

I. Quantitative analysis of carbohydrates

Estimation of Reducing Sugar by Benedict's method

Estimation of Fructose by Roe's Resorcinol method

II. Estimation of protein by Biuret method

III. Fats

Determination of saponification number of oil.

IV. Vitamins

Estimation of ascorbic acid by 2,6, dichlorophenol, indophenols method in lemon/cabbage / green chillies.

V. Minerals.

Estimation of Calcium in the Ash solution of Green leafy vegetable by titrimetric method

**FINAL PRACTICAL EXAMINATION
SEMESTER II
B.Sc APPLIED NUTRITION & PUBLIC HEALTH
PAPER (2): NUTRITIONAL BIOCHEMISTRY**

TIME: 3 HOURS

MAX MARKS: 50 MARKS

DATE: _____

BATCH: _____

MAJOR:

1. Estimate the amount of any one of the following present in the given sample solution. (25 MARKS)
- a) Reducing sugar by Benedict's Method.
 - b) Proteins by Biuret Method.
 - c) Ascorbic acid by Dye Method.

GIVE THE

- ❖ Principle. (6 MARKS)
- ❖ Procedure. (7 MARKS)
- ❖ Observation and Calculation. (12 MARKS)

MINOR:

2. Estimate the amount of calcium in the give sample. (15 MARKS)
3. Write the detailed procedure for the determination of saponification of oil. (5 MARKS)
4. Record. (5 MARKS)

**B.SC. IIYEAR
III-SEMESTER
PAPER-BS301, SEC- 1
FOOD SERVICE MANAGEMENT**

NO. OF HOURS 30

CREDITS 2

**CREDIT I: MANAGEMENT OF FOOD & FOOD SERVICE ESTABLISHMENTS
15Hours**

- 1.1 Principles of management, types of foodservice institution- commercial & Non-commercial
- 1.2 Food management: Construction of the menu, Importance of menu planning, types of menu- A 'la carte, table d'hote, combination & food service style

**CREDIT II: SETTING UP A FOOD SERVICE CREDIT & FINANCIAL
MANAGEMENT 11 Hours**

- 2.1 Setting up Food Service: layout & design, planning team, architectural features, process flow, time management.
- 2.2 Financial Management: Component of cost, Cost control, factors affecting losses.

RECOMMENDED BOOKS:

1. Catering Management – An Integrated Approach – Mohini Sethi, Surjeet Malhan, 3rd edition, New Age International Publishers.
2. Institutional Food Management – Mohini Sethi, New Age International Publishers.

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**B.SC. II YEAR
III-SEMESTER
BS 305, DSC-1C**

PAPER III-FOOD SCIENCE & TECHNOLOGY (THEORY)

NO.OF HOURS:60

CREDITS: 4

CREDIT I: BASICS OF FOOD SCIENCE, CEREALS & MILLETS 15Hours

- 1.1 Definition of food science and food technology. Brief objectives of cooking, and cooking methods.
- 1.2 Cereals & millets: Cereal - (Rice and wheat)-Structure, Nutritive value, Composition, role in cookery.
- 1.3 Millets- Types of millets – Jowar& Maize
- 1.4 Milling of wheat and corn.
- 1.5 Role of gluten in dough formation, factors affecting gluten formation.

CREDIT II: PULSES & LEGUMES, MILK & MILK PRODUCTS 15 Hours

- 2.1 Pulses & legumes: Nutritive value, germination, Anti-nutritional factors, elimination, the role of pulses in cookery.
- 2.2 Processing- Milling of pulses, legume protein concentrate, quick-cooking legumes.
- 2.3 Milk & milk products: types, nutritive value, composition, processing of milk, role in cookery
- 2.4 Different types of Fermented & non-fermented milk products.
- 2.5 Processing of Cheese & Curd.
- 2.6 Processing of Paneer&Khoa.

CREDIT III: FLESHY FOODS, SPICES, CONDIMENTS & BEVERAGES 15 Hours

- 3.1 Fleshy foods (a) Meat: sources & types, nutrient composition, post mortem changes & processing of Meat-Ageing, tenderization and curing.
(b) Fish: Classification & types of fish, selection of fish.
(c) Eggs: Structure, composition, nutritive value, the role of egg in cookery.
- 3.2 Spices and condiments: List of various spices and condiments in Indian Cookery- Cinnamon, Clove, Fenugreek Seed, Ginger, Garlic, Onion, Turmeric, Fennel Seeds- active compounds and medicinal values.
- 3.3 Beverages - Definition, Classification, Processing- black tea, green tea and wine.

CREDIT IV: VEGETABLES & FRUITS, SUGAR & JAGGERY, FATS & OILS

15 Hours

- 4.1 Vegetables: classification, composition- pigments, organic acids, enzymes, flavour compounds, Nutritive value.
- 4.2 Fruits: definition, classification, composition- pigments, water content, cellulose & pectic substances, flavour constituents, polyphenols, nutritive value, changes during ripening, enzymatic browning.
- 4.3 Sugar & jaggery: sources, types, role in cookery.
- 4.4 Fats & oils: Sources, types, spoilage- rancidity, refining of oils, role in cookery.

RECOMMENDED BOOKS:

1. Textbook of Sri Lakshmi. B- food science 5th edition, New age international publishers, New Delhi – 110002, 2011
2. Norman potter N- food science, CBS publishers & distributors, New Delhi-110002, 2007
3. Food processing and preservation, G.Subbulakshmi and Shobha A.Udipi, New age international publishers, 2010.
4. Food preservation and processing, Manoranjan Kalia, Sangita Sood, Kalyani Publishers, New Delhi, 2018.

SUGGESTED READING:

1. Shakuntala Manay N- Foods Facts & Principles, New Age International Publishers, New Delhi- 110002, 2005

**B.SC. II YEAR
III-SEMESTER
BS305, DSC-1C
PAPER III- FOOD SCIENCE & TECHNOLOGY (PRACTICALS)**

Total No. Of Practicals: 7

1. Demonstration of Standard Weights & Measures, Types of cut: Julienne, Chiffonade, Diagonal, Roll cut, Cubes and flower cut.
2. Cookery Practical's in:
 - i. Cereals & Pulses.
 - ii. Milk & Its Products, Fleshy Foods- Meat, Fish & Eggs.
 - iii. Vegetables & Fruits.
4. Estimation of Gluten
5. Evaluation of Egg quality – candle test& floating test
6. Stages of sugar cookery:
 - i. Thread – Gulabjamun
 - ii. Softball- Barfi
 - iii. Hard crack- Chikki

FINAL PRACTICAL EXAMINATION SEMESTER-III
B.Sc.(CBCS) APPLIED NUTRITION AND PUBLIC HEALTH
PAPER-III FOOD SCIENCE & TECHNOLOGY

BATCH: _____

DATE: _____

TIME: 2 HOURS

MARKS: 50 MARKS

- I.** Write the detailed method of preparation for the recipe. Calculate the Nutritive Value for the serving.
(15M)
- II.** Prepare and Display the recipe. (15M)
- III.** Evaluate the quality of egg (15M)
(OR)
Demonstrate the different stages of sugar cookery
(OR)
Estimate the gluten content of the given sample
- IV.** Practical Record (5M)

**B.SC. II YEAR
IV-SEMESTER
BS 401, SEC-2
QUANTITY FOOD PRODUCTION**

NO. OF HOURS - 30HOURS

CREDITS 2

**CREDIT I: QUANTITY FOOD PRODUCTION, PLANNING AND CONTROL
15 HOURS**

- 1.1 Principles of food production-menu, ingredient control etc. Production control –use of standardized recipes.
- 1.2 Safeguarding food Production-Quality control in food preparation, control of the microbial quality of food.

CREDIT II: FOOD MANAGEMENT 15 HOURS

- 2.1 Purchasing –market and the buyer, mode of purchasing, methods of purchase.Storage. Cooking Equipment.Records necessary for catering.
- 2.2 Methods of delivery –centralized, decentralized. Types of service-table/ counter, self, tray.

BOOKS RECOMMENDED

1. Catering Management – An Integrated Approach – Mohini Sethi, Surjeet Malhan, 3rd edition, New Age International Publishers.
2. Institutional Food Management –Mohini Sethi. New Age International Publishers.
3. Foodservice management, principles and practices, 13th edition- June Pyne Palacio, Monica thiecc.,Pearson publishers

**B.SC. II YEAR
IV-SEMESTER
BS405, DSC-1D
PAPER-IV FAMILY & COMMUNITY NUTRITION (THEORY)**

NO. OF HOURS - 60HOURS

CREDITS 4

CREDIT I: BASICS OF MEAL PLANNING

14 Hours

- 1.1 Definition of Balanced diets, RDA, Factors affecting RDA, ICMR recommendations.
- 1.2 Food pyramid, my food plate.
- 1.3 Food Exchange List (raw), food composition tables.
- 1.6 Principles & objectives of meal planning
- 1.5 Nutrient requirement & meal planning for adults, changes in nutrient requirement according to sex, age & activity.

CREDIT II: NUTRITIONAL REQUIREMENT DURING PREGNANCY, LACTATION & INFANCY

16 Hours

Nutrient requirement & RDA for

- 2.1 Expectant mother- physiological changes, dietary modification & complications.
- 2.2 Lactation- general dietary guidelines & role of special foods.
- 2.3 Infancy- growth & development, breastfeeding v/s artificial feeding, factors to be considered while preparing & introducing supplementary foods.

CREDIT III: NUTRIENT REQUIREMENT FOR PRE SCHOOLERS, SCHOOL GOING CHILD & ADOLESCENT

15 Hours

Nutrient requirement & RDA for

- 3.1 Preschoolers- problems in feeding, factors affecting nutritional status.
- 3.2 School going child- the importance of breakfast, packed lunch & mid-day meal programs- ICDS, SNP.
- 3.3 Adolescence- eating disorder, anaemia, anaemia prophylaxis program.

CREDIT IV: NUTRITION REQUIREMENT FOR GERIATRIC GROUP & NUTRITIONAL ASSESSMENT

15 Hours

- 4.1 Geriatrics- RDA & nutritional requirement during old age, physiological changes & dietary modification.
- 4.2 Nutritional Assessment- Methods of Assessment of Nutritional status, Anthropometric, Biochemical, Clinical methods & Diet surveys.

REFERENCE BOOKS:

1. Sri Lakshmi. B- Dietetics, New Age International Publishers, New Delhi-110002, 2011.
2. Sri Lakshmi.B- Nutrition Science, 5th Edition, New Age International Publishers, New Delhi- 110002, 2011.

SUGGESTED BOOKS:

1. Mahtab.S. Bamji, Kamala Krishnaswamy, G.N.V Brahmam- A text on Human Nutrition, 3rd edition, Oxford & IBH Publishing. Co. PVT. LTD. New Delhi

**B.SC. II YEAR
IV-SEMESTER
BS405, DSC-1D
PAPER-IV FAMILY & COMMUNITY NUTRITION (PRACTICAL)**

CREDIT 2

TOTAL NO. OF PRACTICAL:10

1. Planning of diets
 - a. Adult- according to sex & activity.
 - b. Pregnant & lactating women.
 - c. School going child.
 - d. Adolescents.
 - e. Old age group.
2. Preparation of diets - 4 practical sessions.
3. Formulation & preparation of weaning mix.

FINAL PRACTICAL EXAMINATION
SEMESTER IV
APPLIED NUTRITION & PUBLIC HEALTH
PAPER (4): FAMILY & COMMUNITY NUTRITION

TIME: 3 HOURS

MAX MARKS: 50 MARKS

DATE: _____

BATCH: _____

1. Write the RDA? (5 Marks)
2. Plan A Day's Diet For The Given Age Group And Calculate The Nutritive Value For Any Three Nutrients Of Importance.

(25

Marks)

- a. Adulthood
 - b. Pregnant Women
 - c. Lactating Mother
 - d. School Going Child
 - e. Adolescent
 - f. Old Age Group
- i. Planned Menu (10 Marks)
 - ii. Calculate any three nutrients of importance (15 Marks)
3. Preparation & Display of The Diet. (15 Marks)
 4. Record. (5 Marks)

B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR

V - SEMESTER

**BS 503, GENERIC ELECTIVE -1 (GE 1)
FUNDAMENTALS OF FOOD AND NUTRITION**

NO. OF HOURS: 60

CREDITS: 4

CREDIT I: FUNDAMENTALS OF FOOD

15 Hours

1.1 Definition of food, Types of foods- Nano foods, Convenience foods,

1.2 Texturized Foods, space Foods, Novel foods, Organic foods

CREDIT II: FUNDAMENTALS OF NUTRITION

15 Hours

2.1 Definition of Nutrition

2.2 Digestion, absorption & assimilation of nutrients in the human gut

2.3 Benefits of intestinal microflora- Pre & probiotics.

CREDIT III. FOOD SAFETY AND QUALITY CONTROL

15 Hours

3.1 Selecting and purchasing food

3.2 Understanding food labels

3.3 Storing raw foods and cooked foods

3.4 Definition of food adulteration and common adulterants present in food

CREDIT IV. HYGIENE AND SANITATION

15 Hours

4.1 Definition of hygiene and sanitation

4.2 Personal hygiene of food Handler

4.3 Techniques of washing hands

4.4 Pest control and garbage disposal

REFERENCE BOOKS:

1. Sri Lakshmi. B, Nutrition Science, New age international Pvt. Ltd. publishers.
2. Srilakshmi B., Food Science, New Age International Pvt. Ltd publishers
3. Biochemistry- U Satyanarayana, U chakrapani, Books and Allied (Pvt . Ltd.)
4. The pink book –food smart by FSSAI
5. Catering Management – An Integrated Approach – MohiniSethi, Surjeet Malhan,3rd edition, New Age International Publishers.

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**B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR
V - SEMESTER
BS504 (A) - DISCIPLINE SPECIFIC ELECTIVE 1E (DSE 1E)
CLINICAL DIETETICS**

NO. OF HOURS: 60

CREDITS: 4

CREDIT I: INTRODUCTION TO THERAPEUTIC DIETS

15 Hours

- 1.1 Principles of diet in diseases- objectives of diet therapy & role of a dietitian.
- 1.2 Therapeutic modification of normal diet (Texture), classification of diets according to nutrients.
- 1.3 Critical care nutrition- types of feeding; enteral feeding – types of food – Natural liquid foods, blenderized feeding and elemental diets, Parental- TPN, PPN.
- 1.4 Aetiology, Symptom, Dietary Management: Fevers, Typhoid & TB.

CREDIT II: DIET IN CHRONIC DISEASES

15 Hours

Aetiology, Symptom, Dietary Management in:

- 2.1 Obesity – theories of obesity, assessment, types and complications.
- 2.2 Underweight
- 2.3 Hypertension.
- 2.4 CVD: atherosclerosis.
- 2.5 Diabetes Mellitus – Types, Diagnosis, GI & GL Types of insulin and their action.

CREDIT III: DIET IN DISEASES OF ALIMENTARY SYSTEM

15 Hours

Aetiology, symptoms, dietary management: GI diseases-

- 3.1 Peptic ulcer – Mechanism of ulcer formation, diagnosis.
- 3.2 Constipation – types of constipation
- 3.3 Diarrhoea – types, Physiological disturbances in the body.
- 3.4 Irritable bowel syndrome

CREDIT IV: DIET IN DISEASES OF HEPATIC & EXCRETORY SYSTEM

15 Hours

Aetiology, symptoms, dietary management in

- 4.1 Renal disorders- nephritis, nephrotic syndrome, acute renal failure, chronic renal failure. Dialysis - types of dialysis and dietary management
- 4.2 Liver disorders – Agents responsible for liver damage, Damage caused to the liver.
- 4.3 Infectious hepatitis - Types of hepatitis viruses
- 4.4 Cirrhosis of liver

REFERENCE BOOKS:

1. Sri Lakshmi.B – Dietetics, New Age International Publishers.
2. Antia FP. Clinical dietetics and Nutrition, 2nd Edition, Oxford University Press, Delhi.
3. Swaminathan- Advance textbook in Food& Nutrition Volume II, the Bangalore Printing and publishing company.
4. Krause M, Katherleen. L Mahan and Sylvia Escott Stump, Food, Nutrition, & Diet Therapy, 11 edition WB Saunders Company, Philadelphia, 2004
5. Joshi AS. Nutrition& Dietetics 2010, Tata Mc. Graw Hill.
6. Robinson C. H. Lawler M. R., Chenoweth W. L. &GarwickA E., Normal and Therapeutic Nutrition, Mc Millan Publishing Company.

SUGGESTED BOOKS:

1. Modern Nutrition In Health And Disease by Maurice E. Shils, Moshe Shike, A.
2. Catharine Ross, Lippincott William and Wilkins publications
3. Sue Rodwell Williams, Nutrition and Diet therapy, Times Mirror/ Mosby, College Publishing st. Louis.
4. Kumud Khanna, textbook of nutrition and dietetics, phoenix publishing house, Pvt, Ltd. New Delhi
5. Guyton & Hall- textbook of medical physiology, 9th edition, W.B saunders& co.
6. Burtis G., Davis J. and Martin S. Applied Nutrition and Diet Therapy, W.B. SaundersCo.

**B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR
V - SEMESTER
BS504 (A) - DISCIPLINE SPECIFIC ELECTIVE 1E (DSE 1E)
CLINICAL DIETETICS (PRACTICALS)**

NO. OF HOURS: 30

CREDITS: 2

I. Planning of diets & calculation of the nutritive value of the following diets

- 1.1 Routine hospital diets- clear, full fluid & soft diet.
- 1.2 Diet for peptic Ulcer-Soft & bland diet.
- 1.3 Degenerative disease- DM, atherosclerosis, HTN.
- 1.4 Renal disorder- Low sodium, moderate/low protein diet
- 1.5 Liver disorder- jaundice & cirrhosis.

II. Preparation of diets- 4 practical sessions

III. Anthropometric assessment – Height, Weight, BMI, Waist – Hip ratio, Body fat.

FINAL PRACTICAL EXAMINATION SEMESTER-V
B.Sc.(CBCS) APPLIED NUTRITION AND PUBLIC HEALTH
PAPER-VCLINICAL DIETETICS

BATCH: _____

DATE: _____

TIME: 3 HOURS

MARKS: 50 MARKS

- 1. Write The Modified RDA for The Given Condition (5Marks)**
- 2. Plan A Day's Diet for The Given Condition (10 Marks)**
 - a) Peptic Ulcer
 - b) Diabetes Mellitus with Obesity
 - c) Atherosclerosis
 - d) Hypertension
 - e) Glomerulonephritis
 - f) Nephrotic Syndrome
 - g) Jaundice
 - h) Cirrhosis of Liver
- 3. Calculate The Any THREE Nutrients of Importance & conclusion table (12 Marks)**
- 4. Preparation of Selected Meal and Display (8 Marks)**
- 5. Assess your anthropometric measurements and write a brief report on it. (10 Marks)**
- 6. Certified Record (5 Marks)**

**B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR
V- SEMESTER
BS504 (B) - DISCIPLINE SPECIFIC ELECTIVE- 1E (DSE 1E)
FOOD SAFETY AND QUALITY CONTROL**

NO. OF HOURS: 60

CREDITS: 4

CREDIT I INTRODUCTION TO FOOD SAFETY

15 Hours

- 1.1 Food safety issues; physical, chemical and microbiological contaminants, bovine spongiform encephalopathy (BSE), genetically modified organisms and genetically modified foods. Food safety system, definitions and terminology in Quality Management Systems.
- 1.2 History of quality control and quality management. Quality management theories and their authors

CREDIT II PHYSICAL AND CHEMICAL CONTAMINANTS

15 Hours

- 2.1 Metals, mineral (soil, engine oil, stones), plant (leaves, twigs, pods and skins), animal (hair, bone, excreta, blood, insects, larvae).
- 2.2 Safety evaluation of food ingredients. Major pathways by which chemical residues and contaminants enter the food chain.
- 2.3 Agrochemicals and veterinary drugs, packaging materials, process equipment and Ingredient impurities.

CREDIT III NATURAL TOXIC SUBSTANCES & ADDITIVES

15 Hours

- 3.1 Mycotoxins, Marine and Freshwater toxins (formally known as Phycotoxins), Plant toxins and toxic plants, Toxic Mushrooms,
- 3.2 Nature, properties and function of various classes of food additives (colourants, flavours, sweeteners, thickening and gelling agents, and antioxidant preservatives).
- 3.3 Radioactivity – residues as contaminants and residues from irradiation

CREDIT IV MICROBIAL FOOD SAFETY & CONTROL OF FOOD SAFETY

15 Hours

- 4.1 **Microbial food safety:** The significance of foodborne disease.
- 4.2 Protozoa; *Cryptosporidium parvum*. Toxigenic fungi; mycotoxins of *Aspergillus*.
- 4.3 Foodborne viruses; gastroenteritis viruses.
- 4.4 **Control of Food Safety and Quality Management:** Protecting public health and eliminating risk. Farm to table strategy and animal traceability.
- 4.5 Good Manufacturing Practices (GMPs); Hazard Analysis and Critical Control Point (HACCP) concept; Quality Management Systems: ISO 9000.

REFERENCE BOOKS:

1. Jacob M., Safe Food Handling - A training guide for the Manager, WHO, Geneva.
2. Mudambi S.R., Rao S.M. and Rajagopal M.V. Food Science, New Age International Publishers.
3. Patil, P.V. Food Contamination and Safety, Aavishkar Publishers, Distributors, Jaipur, India.
4. Nicholas Johns, Managing Food Hygiene, Mac Millan Publishing Co.
5. Hobbs, B.C. and Gilbert R.J. Food Poisoning and Food Hygiene, The English Language Book Society and Edward Arnold Publishers Ltd.

B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR

V – SEMESTER,

**BS504 (B) - DISCIPLINE SPECIFIC ELECTIVE- 1E (DSE 1E)
FOOD SAFETY AND QUALITY CONTROL (PRACTICALS)**

NO. OF HOURS: 30

CREDITS 2

1. Examine and judge the appropriateness of packaging of food to ensure compliance with Indian laws for canned, bottled & tetra packs.
2. A market survey of 3 processed product food (any 3) with respect to standards (nutrition labelling, certification etc.) to be able to judge the status of claims and misleading descriptions.
3. Prepare a record file adding the various type of packaging material, write a report on the type of packaging material, characteristics and stability, nutritional labelling of 15 packaging materials.
4. Examining food contamination by microorganism using direct examination and cultural technique.
5. Detection of artificial colour by TLC method.

B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR

V – SEMESTER,

**BS504 (B) - DISCIPLINE SPECIFIC ELECTIVE- 1E (DSE 1E)
FOOD SAFETY AND QUALITY CONTROL (PRACTICALS)**

BATCH: _____

DATE: _____

TIME: 3 HOURS

MARKS: 50 MARKS

1. Identify the given packaging material, write a report on packaging material and food law/ guidelines with respect to packaging material.

15M

a) Tetra packs

b) Cans

c) Bottles

2. Read the label of the given food product and write the report on nutritional, labelling, logo and ingredients/ additives.

10M

3. Examining food contamination by microorganism using direct examination and cultural technique.

OR

Detection of artificial color by TLC method.

15M

4. Record

10M

**B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR
VI - SEMESTER
BS 603 (A) - DISCIPLINE SPECIFIC ELECTIVE DSE 1F
PUBLIC HEALTH, FOOD HYGIENE & SANITATION**

NO. OF HOURS: 60

CREDITS: 4

**CREDIT I: INTRODUCTION TO PUBLIC HEALTH & MEDICAL ENTOMOLOGY
15 Hours**

- 1.1 Definition of Public Health, Hygiene, Social and preventive medicine.
- 1.2 Epidemiological triad, Mode of diseases transmission & disease cycle.
- 1.3 Epidemiological methods- steps, advantages & disadvantages. Descriptive, Analytical, Experimental epidemiology.
- 1.4 Medical Entomology, Control of household pest with special reference to mosquito, housefly Environmental, chemical, biological and generic control.

**CREDIT II: FOODBORNE DISEASE
15 Hours**

- 2.1 Food Borne Disorders: Foodborne infections- Typhoid, Paratyphoid cholera, infective hepatitis, amoebiasis
- 2.2 Foodborne intoxications- Disorders caused by; Natural toxins – Aflatoxin, Saponin, chemical toxins and Microbiological toxins in food- Staphylococcal intoxication, Botulism, Clostridium perfringens, Mycotoxins, control of foodborne illness.

**CREDIT III: HEALTH EDUCATION
15 Hours**

- 3.1 Health and Nutrition- education-definition, components, principles of health education, methodology- individual, group and mass methods use of audiovisual aids.
- 3.2 Primary health care system with special reference to Maternal and Child HealthCare.
- 3.3 Primary health system functioning in rural areas, health indicators mortality(Infant & maternal), morbidity, disability and various health organizations,
- 3.4 Malaria and AIDs Control-NHP, WHO, UNICEF, ICDS.
- 3.5 Immunizing agents, hazards of immunisation, National Immunisation schedule.

CREDIT IV: FOOD ADULTERATION & STANDARDS 15 Hours

- 4.1 Food adulteration: Types of adulterants: Incidental adulteration – Microorganisms, Metallic and Packaging. Intentional adulteration - common, adulterants.
- 4.2 Food standards and food laws – PFA, Essential Commodities Act – FPO, MPO, MMPO, Deoiled meal flour control, vegetable product control order, Standards of weights and measures rules.
- 4.3 National and International standards - FSSAI, FFRC, Agmark, Codex Alimentarius, HACCP, ISO Certification, BIS.
- 4.4 Consumer guidance society, consumer rights, consumer courts, central facility for assessing food adulteration, Role of food inspectors.

SUGGESTED BOOKS

1. Food hygiene & sanitation- Roday.S, Tata Mc Graw Hill publishing company ltd.
2. Mohini Sethi, catering management, New age international publishers.
3. Sri Lakshmi.B – Food science, New Age International Publishers.
4. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21stEditionM/sBanarasi das Bhanot Publishers, Jabalpur, India.

B.SC. APPLIED NUTRITION AND PUBLIC HEALTH
III YEAR
VI SEMESTER
BS603 (A) - DISCIPLINE SPECIFIC ELECTIVE- DSE 1F
PUBLIC HEALTH, FOOD HYGIENE AND SANITATION (PRACTICAL)

NO. OF HOURS: 30
CREDITS: 2

- I. Identification of adulterants in various classes of food samples**
 - a) Cereals and pulses**
 - b) Milk and milk products – milk, curd, khoa**
 - c) Ghee, oil, butter.**
 - d) Spices and condiments- chilli powder, turmeric, pepper, asafetida, dhania, Salt, whole and powdered spices**
 - e) Sugar, honey and jaggery, tea coffee and miscellaneous foods**

- II. Preparation of 3 audiovisual aids like Flashcard/PowerPoint, poster and models related to health and nutrition.**

- III. Formulation and preparation of a low-cost nutritious recipe**
- IV. Field visit. Report writing on a field visit.**

FINAL PRACTICAL EXAMINATION SEMESTER-V NOVEMBER-2019

R.Sc.(CBCS) APPLIED NUTRITION AND PUBLIC HEALTH

BS 603(A)

PAPER-VI PUBLIC HEALTH, FOOD HYGIENE AND SANITATION

BATCH: _____

DATE: _____

TIME: 2 HOURS

MARKS: 50 MARKS

1. Identify the adulterants present in the given milk sample (15 mark)
2. Identify the adulterants present from given set of sample(any 2 samples) (10mark)
 - a) Cereals and pulses
 - b) Spices and condiments
 - c) Milk and products
 - d) Fats and oils
 - e) Sweeteners
 - f) Beverages
3. Audio Visual Aids. (20 mark)
4. Certified record (5 mark)

B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR

VI – SEMESTER

BS603 (B), DSE – I (F), PAPER – VIII

NUTRITION THERAPY IN CRITICAL CONDITIONS

NO. OF HOURS: 60

CREDITS: 4

CREDIT I: ADVANCE CARE IN NUTRITION

15 Hours

- 1.1 Pre & post-operative care.
- 1.2 Nutritional assessment of critically ill patients.
- 1.3 Diet in gastritis: symptoms of gastritis, dietary management
- 1.4 Burns: Degree of burns, fluid & electrolyte replacement & dietary management

CREDIT II: DIET IN DEGENERATIVE DISEASES

15 Hours

- 2.1 Cancer- definition, types, cancer therapy, & dietary management of cancer patients.
- 2.2 Hyperlipidemia & congestive heart failure: etiology, symptoms & dietary management. Surgical procedures: CABG.
- 2.3 Respiratory Disorders: Pneumonia, COPD.

CREDIT III: DIET IN RENAL DISEASE

15 Hours

- 3.1 Diet in renal disorders: causes, symptoms & dietary treatment in ARF, CRF. Types of dialysis, renal calculi- types & dietary management.
- 3.2 Gout: causes, symptoms & diet

CREDIT IV: DIET IN DISEASES OF LIVER, GALL BLADDER, PANCREAS – MALABSORPTION SYNDROME

15 Hours

- Etiology, symptoms & dietary management:**
- 4.1 Hepatic coma, Cholelithiasis, cholecystitis & pancreatitis.
 - 4.2 Diet in disturbance of small intestine & colon: spruce, celiac disease, & disaccharide Intolerance- symptoms & dietary management

REFERENCE BOOKS:

1. Sri Lakshmi.B – Dietetics, New Age International Publishers.
2. Antia FP. Clinical dietetics and Nutrition, 2nd Edition, Oxford University Press, Delhi.
3. Swaminathan- Advance textbook in Food & Nutrition Volume II, the Bangalore reprinting and publishing company.
4. Krause M, Kathleen. L Mahan and Sylvia Escott Stump, Food, Nutrition, & Diet Therapy, 11 edition WB Saunders Company, Philadelphia, 2004
5. Joshi AS. Nutrition & Dietetics 2010, Tata Mc. Graw Hill.
6. Robinson C. H. Lawler M. R., Chenoweth W. L. & Garwick A E., Normal and Therapeutic Nutrition, Mc Millan Publishing Company.

SUGGESTED BOOKS:

1. Modern Nutrition In Health And Disease by Maurice E. Shils, Moshe Shike, A.
2. Catharine Ross, Lippincott William and Wilkins publications
3. Sue Rodwell Williams, Nutrition and Diet therapy, Times Mirror/ Mosby, College Publishing st. Louis.
4. Kumud Khanna, textbook of nutrition and dietetics, phoenix publishing house, Pvt, Ltd. New Delhi
5. Guyton & Hall- textbook of medical physiology, 9th edition, W.B saunders & co. Burtis G., Davis J. and Martin S. Applied Nutrition and Diet Therapy, W.B.Saunders Co.

B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR

VI – SEMESTER

DSE – I (F), PAPER – VIII PRACTICALS

NUTRITION THERAPY IN CRITICAL CONDITIONS

NO. OF HOURS: 30

CREDITS: 2

- Planning and preparation of diets for Hyperlipidemia.
- Planning and preparation of diets for Congestive Heart Failure.
- Planning and preparation of diets for Acute Renal failure and Chronic Renal failure.
- Planning and preparation of diets for patients with chronic renal failure undergoing Dialysis.
- Planning and preparation of diets for Renal calculi.
- Planning and preparation of diets for Surgery

FINAL PRACTICAL EXAMINATION SEMESTER-VI
B.Sc.(CBCS) APPLIED NUTRITION AND PUBLIC HEALTH
PAPER-VI NUTRITION THERAPY IN CRITICAL CONDITIONS

BATCH: _____

DATE: _____

TIME: 2 HOURS

MARKS: 50 MARKS

- 1. Write The Modified RDA for The Given Condition** (5Marks)
- 2. Plan A Day's Diet for The Given Condition** (10 Marks)
 - a) Hyperlipidemia
 - b) Congestive Heart Failure
 - c) Acute Renal Failure
 - d) Chronic Renal Failure
 - e) Chronic Renal failure with dialysis
 - f) Renal Calculi
 - g) Surgery
- 3. Calculate The Any Two Nutrients of Importance & conclusion table** (15 Marks)
- 4. Preparation of Selected Meal and Display** (15 Marks)
- 5. Certified Record** (5 Marks)

**B.SC. APPLIED NUTRITION AND PUBLIC HEALTH III YEAR
VI SEMESTER
PROJECT/ADVANCED NUTRITION BS 606**

CREDIT I: BASICS OF FOOD TECHNOLOGY & SPOILAGE 15 Hours

- 1.1 Food Technology and its application, Role of Food technology in combating malnutrition in developed countries.
- 1.2 Role of biotechnology and microbiology in food technology.
- 1.3 Food spoilage and nutrient losses during storage- physical, chemical and microbial spoilage of foods, agents causing food spoilage.

CREDIT II: TECHNIQUES IN FOOD PRESERVATION 15 Hours

- 2.1 Food Preservation- the importance and general principles of food preservation.
- 2.2 Home scale methods of food preservation like drying, refrigeration, pickling, use of sugars.
- 2.3 Flow chart for:
 - Mango pickle
 - Jelly
 - Amlakamurabba
- 2.4 Commercial methods of food preservation - Preservation by high temperature-Canning, low temperature-Freezing, dehydration-(Sun drying, spray drying, foam mat drying). Concentration- Vacuum drying, radiation, chemicals and use of preservatives.

CREDIT III - FOOD PACKAGING & LABELLING 15 Hours

- 3.1 Functions of packaging, requirement of packaging, classification of packaging material – pack, intermediate pack, bulk pack.
- 3.2 Materials used for packaging – metal, aluminium, glass, paper, plastic and films, laminates, wooden packaging, edible food wraps.
- 3.3 Packaging of specific foods- cereals, meat and fish and fruits and vegetables.
- 3.4 Laws related to packaging.
- 3.5 Nutritional labelling - labelling food provision in existing food laws.

CREDIT IV- NEWER APPROACHES IN FOOD TECHNOLOGY 15 Hours

- 4.1 Functional foods and antioxidants – definition, classification, role in health and disease
- 4.2 Classification of nutraceuticals based on food source – photochemical as nutraceuticals, microbes as nutraceuticals, dietary fibre, animal products as nutraceuticals.

SUGGESTED BOOKS:

1. Textbook of Sri Lakshmi. B- food science 5th edition, New age international publishers, New Delhi – 110002, 2011
2. Norman potter N- food science, CBS publishers & distributors, New Delhi-110002, 2007
3. Food processing and preservation, G.Subbulakshmi and Shobha A.Udipi, New age international publishers, 2010.
4. Food preservation and processing, Manoranjan Kalia, Sangita sood, Kalyani Publishers, New Delhi, 2018.
5. Food hygiene & sanitation- Roday.S tataMcGraw hill publishing company ltd.



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HEAD

Department of Biochemistry
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FACULTY OF SCIENCE
B.SC I SEMESTER(CBCS) EXAMINATION,
SUBJECT: APPLIED NUTRITION & PUBLIC HEALTH
COMMON MODEL QUESTION PAPER FOR DSC AND DSE, GE

TIME: 3HRS
80

MAX MARKS:

PART A (8x4=32M)

(SHORT ANSWER TYPE)

NOTE: ANSWER ANY EIGHT OF THE FOLLOWING QUESTIONS

1. CREDIT I
2. CREDIT I
3. CREDIT I
4. CREDIT II
5. CREDIT II
6. CREDIT II
7. CREDIT III
8. CREDIT III
9. CREDIT III
10. CREDIT IV
11. CREDIT IV
12. CREDIT IV

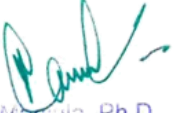
PART -B

(ESSAY ANSWER TYPE)

NOTE: ATTEMPT ALL THE QUESTIONS

(4x12=48M)

- 13 (a) CREDIT I
(or)
(b) CREDIT I
- 14 (a) CREDIT II
(or)
(b) CREDIT II
- 15 (a) CREDIT III
(or)
(b) CREDIT III
- 16 (a) CREDIT IV.
(or)
(b) CREDIT IV


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FACULTY OF SCIENCE

B.Sc. (CBCS) II YEAR SEMESTER EXAMINATIONS 2018

SUBJECT: APPLIED NUTRITION AND PUBLIC HEALTH

COMMON MODEL QUESTION PAPER FOR SECS
~~PAPER IV~~ (SEC -1,2,3 and 4)

Time: 1 ½ Hours

Max. Marks:40

Note: Answer all questions. All questions carry equal marks.

PART -A (2×5=10)

1. A) CREDIT I

OR

B) CREDIT I

2. A) CREDIT II

OR

B) CREDIT II

PART - B (2×15=30)

3. A) CREDIT I

OR

B) CREDIT I

4. A) CREDIT II

OR

B) CREDIT II


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