



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

B.Sc. (Life Science / Biotechnology / Chemistry)

BSLS602: Endocrinology

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSLS602	DC	Endocrinology	60	20	20	30	20	4	1	2	7

Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit;

***Teacher Assessment shall be based following components: Quiz/Assignment/ Project/ Participation in Class, given that no component shall exceed more than 10 marks.**

Course Objectives:

1. To know the endocrine gland, hormones and their functions
2. To understand the biochemical mechanism of hormonal action

Course Outcome:

1. Student will know about endocrine lands and their functions
2. Student will understand the biochemical regulation of metabolism by hormones

Unit – I

Introduction to endocrine system; Endocrine glands – thyroid, pituitary, adrenal, hypothalamus, Pancreas, Parathyroid, Pineal, thymus, gonads; secreted hormones and their functions.

Unit – II

Classification of Hormones: Biochemical nature of hormones Amines, peptides, proteins and steroids [epinephrine, dopamine, T3 and T4]; Mechanism of Action- Polar and Nonpolar hormones; effects of hormone interactions

Unit – III

Control of Hormone Secretion: Hypothalamus, Pituitary, thyroid, Adrenal, Pancreas, Gonads.

Unit – IV

Disorders of pituitary, thyroids, pancreas and adrenal glands, gonads. Pheromones



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Unit – V

Biological clock. Synthesis and regulation of melatonin. Role of pineal in circadian rhythms. Neuroendocrine regulation of immune system. Stress hormones and immune responses.

Stress Response.

BSLSL – 605: Endocrinology Laboratory

Practical relevant to the syllabus to be conducted including virtual practicals.

Books

1. Vertebrate Endocrinology, Norris D. O., Elsevier Academic Press,



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BSBT603: Microbial Biotechnology and Medical Microbiology

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSBT603	DC	Microbial Biotechnology and Medical Microbiology	60	20	20	30	20	4	1	2	7

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment shall be based following components: Quiz/Assignment/ Project/ Participation in Class, given that no component shall exceed more than 10 marks..0**

Course Objectives:

1. To know the techniques of microbial biotechnology and their application
2. To know about major diseases associated with microorganisms

Course Outcome:

1. Student will know about microbiological techniques and their applications in industry, medical science and agriculture
2. Student will know about major diseases and the causal organisms

Unit – I

Principle types of fermenters. Batch and continuous fermentation. Down-stream processing and recovery process. Screening of microorganisms and optimization of process parameters. Production of ethyl alcohol and penicillin.

Unit – II

Food and dairy microbiology. Microbes used in food and dairy industry. Single cell protein. Quality control and food preservation.



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Unit – III

Waste water treatment methods for industrial effluents. Solid wastes and sewage treatment. Epidemic diseases and disease transmission. Pandemic and sporadic diseases.

Unit – IV

Major diseases caused by bacteria – Staphylococcus, Salmonella, Vibrio and Mycobacterium. Antibiotics – mode of action and drug resistance.

Unit – V

Diseases caused by fungus.

Diseases caused by virus – hepatitis and HIV

Anti-fungal and anti-viral drugs.

BSBTL 606: Practical

1. Fermentation – alcohol production from grapes
2. Fermentation of milk
3. Bioassay of penicillin
4. Antibiotic sensitivity test
5. Determination of quality of milk
6. Microbiological analysis of food products
7. Estimation of COD and BOD
8. Qualitative analysis of sewage
9. Determination of phenol coefficient
10. Estimation of soil microflora

Books:

1. Text book of microbiology – Prescott
2. General Microbiology – Stanier
3. Food Microbiology – Frazier
4. Principles of fermentation microbiology – Whitaker
5. Elementary Microbiology – H. A. Modi
6. Microbial Biotechnology – Hazare.



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B.Sc. PCM/LS/BT SEMESTER VI

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSCH603	DC	Organic Chemistry II	60	20	20	30	20	3	1	4	6

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

Q/A – Quiz/Assignment/Attendance, MST Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class, given that no component shall exceed more than 10 marks.

Unit: I NMR Spectroscopy:

Principle of nuclear magnetic resonance, basic instrumentation, shielding mechanism, chemical shift, number of signals, spin-spin coupling and coupling constants, splitting of signals, deuterium labeling. Applications of NMR to simple organic compounds.

Unit: II Stereochemistry of Organic Compounds :

Concept of isomerism, Types of isomerism; Optical isomerism – elements of symmetry, molecular chirality, enantiomers, stereogenic center, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centers, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomer, inversion, retention and racemization. Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

Geometric isomerism – determination of configuration of geometric isomers, E & Z system of nomenclature, geometric isomerism in oximes and alicyclic compounds.

Conformational isomerism – conformational analysis of ethane and n-butane; conformations of cyclohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane derivatives, Newman projection and Sawhorse formulae, Fischer and flying wedge formulae, Difference between configuration and conformation.

Unit: III Arenes and Aromaticity:

Nomenclature of benzene derivatives, The aryl group, Aromatic nucleus and side chain, Structure of benzene; molecular formula and Kekulé structure, stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture.



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Aromaticity: The Huckel rule, aromatic ions. Aromatic electrophilic substitution – general pattern of the mechanism, role of σ and π complexes, Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio, Side chain reactions of benzene derivatives, Birch reduction; Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes and biphenyl, naphthalene and Anthracene.

Unit: IV Heterocyclic Compounds:

Introduction, structure of Pyrrole, Furan and Thiophene, Paal Knorr synthesis and electrophilic substitution of Pyrrole, Furan and Thiophene, reactivity and orientation of electrophilic substitution reactions (ESR) in five membered heterocycles (Pyrrole, Furan and Thiophene) Structure of Pyridine, Electrophilic and Nucleophilic substitution reactions of pyridine. Basicity of pyridine.

Unit: V

[A] Carbohydrates

Introduction, classification of carbohydrates, osazone formation, epimerization, step up and step down reactions of monosaccharides, simple structures of glucose and fructose, Fischer's proof of configuration of D-glucose.

[B] Amino acid :

Introduction of amino acid, Classification and properties of amino acids, Zwitter ion , Isoelectric point, Strecker's and Gabreil pthalimide synthesis of amino acids.

Guidelines for Practical:

A two credit lab is to be conducted by covering the most relevant and useful topics from afore mentioned syllabus.

Reference Books

1. Organic Chemistry: I. L. Finar, Vol-II, 5th Edition, Pearson Education Ltd.
2. Organic Chemistry: Morrison & Boyd, 6th Edition, Prentice Hall of India Pvt. Ltd.
3. Stereochemistry of carbon compounds: E. L. Eliel, Wiley Eastern Ltd.
4. Stereochemistry and mechanism through solved problems: P. S. Kalsi, New Age International.
5. Stereochemistry of Organic Compounds: Principles and Applications: D. Nasipuri; New Academic Science; 4th Revised Edition.
6. Organic Chemistry: Hendrickson, Cram, Hammond, Mc Graw-Hill.
7. Organic Chemistry: 6 th Edition, John McMurry, Brooks Cole, International Edition.
8. Organic Chemistry: T.W. Graham Solomons and Craig B. Fryhle Wiley, 8 th Edition.
9. Organic Chemistry: Francis A. Carey, Mc Graw-Hill, 7 th Edition.
10. Organic Chemistry: Leroy G. Wade, Prentice Hall, 6 th Edition.
11. Organic Chemistry: Jonathan Clayden, Nick Greeves, Stuart Warren and Peter Wothers. Oxford University Press, USA.
12. P.S. Kalsi, "Spectroscopy of Organic Compounds", New Age International Pvt. Ltd. Publishers, 2006.
13. C.N. Banwell, "Fundamentals of Molecular Spectroscopy", McGraw-Hill, 1994.
14. Y.R. Sharma, "Elementary Organic Spectroscopy (Principles and Chemical Applications)", S. Chand, 2007.