



Gyanmanjari
Innovative University

Syllabus
Gyanmanjari Science College
Semester-7 (B.Sc)

Subject: Biomedicine - BSCCM17402

Type of course: Major

Prerequisite: Basic knowledge of organic chemistry, chemical structures, and human physiology is required. Understanding of functional groups and basic pharmacology will help in learning drug-related concepts.

Rationale: This course introduces the basics of medicinal chemistry, including classification, structure, and action of drugs such as antiseptics and analgesics. It helps students understand drug synthesis, therapeutic uses, and their role in healthcare, preparing them for higher studies and careers in pharmacy and research.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks					Total Marks
CI	T	P		SEE		CCE			
			Theory	Practical	MSE	LWA/V	ALA		
3	0	2	4	75	25	30	20	50	200

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

3 Credits * 25 Marks = 75 Marks (each credit carries 25 Marks) Theory

1 Credits * 25 Marks = 25 Marks (each credit carries 25 Marks) Practical

SEE 100 Marks will be converted in to 50 Marks

CCE 100 Marks will be converted in to 50 Marks

It is compulsory to pass in each individual component.



Course Content:

Unit No	Course Content	Hrs	% Weightage
1	Chapter-1 History of drugs: History, Introduction, Classification: On basis of therapeutic action: CNS, pharmacodynamic agents, chemotherapeutic agents, vitamins, hormones, drugs used for metabolic diseases & endocrine glands. Some important definitions: Agonist, Antagonist, Analgesics, Anesthetics, Coagulants, Antiemetics, Antihelmitic, Antipyretics, Antispasmodic.	13	25%
2	Chapter-2 Antiseptics: Introduction, some common antiseptics: Alcohols, Boric acid, Hydrogen peroxide, Iodine, sodium chloride, Sodium bicarbonate, Terpenes. Classifications of antiseptics: Halogen compounds: Chlorine water, Dichloramine-T, Gammexane, Iodol. Phenol and its derivatives: Thymol, n-Hexyl resorcinol, Chloro m-Cresol, p-chloro m-xyleneol (Dettol). Aromatic acid and esters: Salol, Betol, Ethyl parasept. Synthetic dyes: TPM, Acridine dyes, Thiazine dye, Brilliant green.	12	25%
3	Chapter-3 Narcotic and non-narcotic analgesics: Introduction-opioid analgesics, opioid receptors location and their functions, Types of actions – opioid agonists, mixed agonists, opioid antagonists, Mechanism of action of opioids, Classification of narcotic analgesics, Chemistry and metabolism of morphine, Structure activity relationship of morphine, various drug and properties of narcotic analgesics.	10	25%
4	Chapter-4 Antibiotics: Antibiotics Introduction Classification 1) Streptomycin :Production, isolation, constitution,Clinical properties 2) Chloramphenicol : Production, isolation, constitution, Sterio-chemistry, Clinical properties	10	25%



Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	Model Development Task The faculty will assign specific model topics. Students are required to design, prepare, and upload their models on the GMIU web portal.	10
2	Creative Poster Design Topics for posters will be provided by the faculty. Students will create informative and creative posters and submit them through the GMIU web portal.	10
3	Drug Analysis Assignment The faculty will provide the name of a medicine. Students must analyze the drug, identify its active ingredients, and upload their findings on the GMIU web portal.	10
4	Structure Identification Activity The faculty will share the chemical structure of a drug. Students need to identify the drug, explain its uses and side effects, and upload the details on the GMIU web portal.	10
5	Attendance	10
Total		50



List of Practical:

Sr. No	Descriptions	Unit No	Hrs
1	A. Estimations 1.Determination of Saponification Value of Oil and Fat 2.Estimation of Amino Group by Acetylation Method 3.Determination of Amount of Aspirin in a Given Sample	1	9
2	B. Organic Synthesis 4.Preparation of Hippuric Acid from Glycine 5.Preparation of Methyl Salicylate from Salicylic Acid	2	6
3	C. Assay of Drugs 6.Assay of Atropine 7.Assay of Ibuprofen 8.Assay of Aspirin	3	9
4	D. Determination of Physical Properties 9.Determination of Partition Coefficient for any two drugs E. Preparation and Evaluation 10.Preparation and Evaluation of Paracetamol Granulation	4	6
		Total	30

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20%	20%	40%	20%	00	00

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.



Course Outcome:

After learning the course the students should be able to:	
CO1	Explain the history, classification, and therapeutic importance of drugs along with key pharmacological definitions such as agonists, antagonists, analgesics, anesthetics, and other drug categories.
CO2	Describe the types, properties, and applications of various antiseptics including alcohols, halogens, phenol derivatives, aromatic compounds, and synthetic dyes.
CO3	Analyze the classification, structure, mechanism of action, and uses of narcotic and non-narcotic analgesics including drugs like codeine, aspirin, ibuprofen, paracetamol, and diclofenac.
CO4	Understand the classification, production, isolation, structure, and clinical significance of antibiotics such as streptomycin and chloramphenicol.

Instructional Method:

The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods by black board, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc. From the content 10% topics are suggested for flipped mode instruction. Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory. The internal evaluation will be done on the basis of Active Learning Assignment. Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

Reference Books:

1. Fundamental/Cell Biology: *Molecular Biology of the Cell* (Alberts et al.), *Essential Cell Biology*.
2. Biochemistry: *Lehninger Principles of Biochemistry*, *Harper's Illustrated Biochemistry*.
3. Immunology: *Janeway's Immunobiology*.
4. Pathology: *Robbins and Kumar Basic Pathology*.
5. Pharmacology: *Rang & Dale's Pharmacology*.
6. Anatomy: *Gray's Anatomy for Students*, *Clinically Oriented Anatomy* (Moore).

