



**Subject:** Synthesis of Drugs -MSCIN13515

**Type of course:** Major

**Prerequisite:** Students should know about basic drugs, their types, allergic drugs, antibiotics, antiseptics, etc.

**Rationale:** Drug chemistry is the science that deals with the design, discovery, and development of new therapeutic agents. It is a multidisciplinary field that draws on knowledge from chemistry, biology, pharmacology, and other sciences.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
4	0	0	4	60	30	10	00	50	150

*Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*

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**Continuous Assessment:**

Sr. No	Active Learning Activities	Marks
1	<b>Pick a Prepare Model:</b> Faculty will provide topics of model and students will prepare and upload it to GMIU web Portal	10
2	<b>Poster Making:</b> Faculty will provide topics for the poster and students will prepare a poster and upload it to GMIU web Portal.	10
3	<b>Lab to Life:</b> During industrial visits students will make a list of chemicals produced there and afterwards they will find out their raw materials used and then upload it on GMIU web Portal.	10
4	<b>Analyze the Drug:</b> The faculty will provide the medicine name and the student will analyze it and list out the active drug and upload it into GMIU web Portal.	10
5	<b>Go with the structure:</b> Faculty will provide the structure of drug students, identify it and give the uses and side effects and upload it into GMIU web Portal.	10
<b>Total</b>		<b>50</b>

Unit No.	Course content	Hrs	% Weightage
1	<b>Chapter-1 History of drugs:</b> 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, Anti metics, Antihelmitic, Antipyretics, Antispasmodic, Broad spectrum antibiotics, Pharmacophore, Antimetabolites, Antibiotics, Tranquilizers, Chemotherapeutic agents, Therapeutic index, Virus, Bacteria,	15	25



	Gram +ve/-ve, Bacteriostatics, Bacteriocidals, In Vivo, In Vitro, Pharmacy, Pharmacophore, API, Custom synthesis, Prodrug, Lead molecule, Toxicity, Toxicology, Drug metabolism, ADME.		
2	<p><b>Chapter-2 Antiseptics:</b></p> <p>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 derivative: Thymol, n-Hexyl resorcinol, Chloro m-Cresol, p-chloro m-xyleneol (Dettol) Aromatic acid and esters. Salol, Betol, Ethyl parasept Synthetic dye: TPM. Aeridine dyes, Thiazine dye, Brilliant green</p>	15	25
3	<p><b>Chapter-3 Antibiotics:</b></p> <p>Introduction, Classification</p> <p>1) Streptomycin: Production, isolation, constitution, Clinical properties 2) Chloramphenicol: Production, isolation, constitution, Stereo-chemistry, Clinical properties</p> <p><b>Chapter-4 Antileprotic agents:</b></p> <p>Introduction, Dapsone (DDS), Solapone, Acedapone (DADDS), Sodium glucosulphone, Promizole.</p>	15	25
4	<p><b>Chapter -5 General &amp; Local Anesthetics</b></p> <p>General Anesthetics: Classification- Inhalation, Intravenous Basal Local Anesthetics: Classification</p> <p>Esters: Americaine, Butamben, Orthocaine, Procaine hydrochloride, Tetracaine hydrochloride</p> <p>Piperidine/Tropane Derivatives: Euphthalmin Amides: Prilocaine hydrochloride, Dipiperodon Quinoline &amp; Isoquinoline analogues: Dibucaine hydrochloride</p>	15	25



## Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	30%	30%	10%	-	-

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	Understand the design of drugs.
CO2	Provide a general explanation of the drug's manufacture, structure, and biological significance.
CO3	Discover the chemistry of medications.
CO4	Execute the different industrial procedures.

### 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:

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- [1] The Chemistry of Synthetic dyes, Vol. I to VII by Venkataraman, Academic Press, New York
- [2] Technology of Textile Processing by V. A. Shehnai, Sevak Publications, Bombay.
- [3] Introduction to industrial Chemistry, Howard L. Whate
- [4] Industrial Chemistry Including Chemical Engineering by B. K. Sharma, Krishna Prakashan Media

