



**Master Degree in Applied Chemistry**  
**M.Sc. (Applied Chemistry) Semester IV**

Course Code	<b>PT04CACH21</b>	Title of the Course	<b>Applied Organic Chemistry - II</b>
Total Credits of the Course	<b>04</b>	Hours per Week	<b>04</b>

Main Focus of the Course outcomes	Employability	Skill Development	Entrepreneurship
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Course Objectives:	1. To study the synthesis and application of various drugs. 2. To introduce the chemistry of natural products. 3. To get an insight into utility of heterocyclic chemistry. 4. To elucidate the disconnection approach and protecting-deprotecting reagents in organic chemistry.		

Course Content		
Unit	Description	Weightage* (%)
1.	<b>Medicinal Chemistry</b> Synthesis and Applications of various drugs: Sedative and Hypnotics: Glutethimide, Oxazepam and methaqualone; Antianxiety agents: Diazepam, Nitroazepam, Maprobamate; Antidepressants: Isocarboxazide, Imipramine, Sertraline; Antipsychotics: Chlorpromazine, Thioridazine, Trifluoperazine, Haloperidol; Cardiovascular Drugs: Nitroglycerine, Nicorandil, Nifedipine, Bepridil, Minoxidil; Antihypertensive drugs: Ramipril; Antibiotics: Penicillins, Cephalosporins, Tetracyclines, Chloramphenicol.	25%
2.	<b>Chemistry of Natural Products</b> Natural products - classification, source and methods of isolation, Synthesis, Structure determination and Applications: Vitamins: Vitamin A <sub>1</sub> , Vitamin B <sub>1</sub> (Thiamine), Vitamin B <sub>6</sub> and Biotin (Vitamin H). Vitamin C, Vitamin B <sub>2</sub> (Riboflavin); Alkaloids: Reserpine, Tylophorine, Cadinene, β-Carotene, Caryophyllene and (-) Khusimone, molecular rearrangement of Caryophyllene and Logifolene; Steroids:	25%





	Cholesterol, Testosterone, Oestrone, progesterone from cholesterol, Cortisone, $\alpha$ -Pinene, Camphor, Hofmann, Emde and von Braun degradation.	
3.	<b>Hetero Cyclic Chemistry</b> Nomenclature of six membered heterocycles with one, two and more heteroatoms: Synthesis and reactions of pyrilium salts and pyrones and their comparison pyridinium, thiopyrylium salts and pyridines, coumarins, chromones, diazines & triazines. Seven membered Heterocycles: Synthesis and reactions of azepines, oxepines and thiepinines. Synthesis: Fischer-Indole synthesis, Skraup synthesis, Combes synthesis, Conrad Limpach and its Knorr synthesis, Pfitzinger synthesis: Bischler-Napieralski synthesis.	25%
4.	<b>Disconnection Approach</b> Introduction of disconnection, One and two group disconnection, disconnection and synthesis of alcohols, olefins, simple ketones, acids and its derivatives, disconnections in 1,3 & 1,5-dioxygenated skeletons (Carbonyls) and application of Mannich reaction. Illogical Two group disconnection: 1,2- diols, 1,4- and 1,6- dicarbonyl compounds, Diels-Alder reaction and its use in organic synthesis, FGI & FGA. Synthesis of 3 and 4 membered small ring compounds, Use of ketenes as intermediate in organic synthesis. Protection of organic functional groups, protecting reagents and removal of protecting groups.	25%

Teaching-Learning Methodology	<ol style="list-style-type: none"><li>1. We make extensive use of chalk and board.</li><li>2. ICT tools such as multimedia projector, smart board etc., are also used for better explanation of scientific concepts.</li><li>3. Detail lecture notes and other reference materials are also provided to the students as and when required from departmental library resources.</li></ol>
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage





1.	Internal Written Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to

1.	Learn about drug synthesis.
2.	Understand about the chemistry behind natural product.
3.	Understand the utility of hetero cycle molecules.
4.	Gain profound knowledge on retro synthetic analysis.

Suggested References:

Sr. No.	References
1.	Medicinal Chemistry and Drug Discovery, 5 <sup>th</sup> Edn., Ed. Manfred. E. Wolff, 1995, John Wiley & Sons Inc.
2.	Natural Products Chemistry, 1 <sup>st</sup> Edn., K. Nakanishi, T. goto, S. Natori, 1991, University Science Books.
3.	Biogenesis of Natural Products, 2 <sup>nd</sup> Edn., Noam Lahav, 1963, Oxford University press.
4.	Heterocyclic Chemistry, 3 <sup>rd</sup> Edn., Raj. K. Bansal, 2017, New Age International.
5.	Work book for organic Synthesis the Disconnection Approach, 2 <sup>nd</sup> Edn., Stuart Warren and Paul Wyatt, 2008, Wiley.
6.	Modern Organic Synthesis an Introduction, 2 <sup>nd</sup> Edn., G. S. Zweifel, 2017, Wiley.

On-line Resources

1.	<a href="https://ocw.mit.edu/courses/chemistry/">https://ocw.mit.edu/courses/chemistry/</a>
2.	<a href="https://swayam.gov.in/explorer?category=Chemistry">https://swayam.gov.in/explorer?category=Chemistry</a>
3.	<a href="http://nptel.ac.in">http://nptel.ac.in</a>

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**SARDAR PATEL UNIVERSITY**  
**Vallabh Vidyanagar, Gujarat**  
**(Reaccredited with 'A' Grade by NAAC (CGPA 3.25))**  
**Syllabus with effect from the Academic Year 2020-2021**

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