INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**MASTER OF SCIENCE (CHEMISTRY)**
SEMESTER	**4**
COURSE TITLE	**ADVANCED ORGANIC CHEMISTRY-II**
COURSE CODE	**02CY0555**
COURSE CREDITS	**4**

Objective:

1 The objective of this course is to study the concepts of photochemistry, chemistry of natural products and various reagents used for protection and deprotection in organic synthesis.

Course Outcomes: After completion of this course, student will be able to:

1 Generalize the concepts of photochemistry.

2 Understand and will have knowledge of chemistry of natural products like alkaloids, vitamins and amino acids.

3 Understand the importance of protecting and deprotecting reagents useful in organic synthesis.

4 Obtain the information regarding carbohydrates and its chemistry

Pre-requisite of course: To study the concepts of photochemistry, chemistry of natural products and various reagents used for protection and deprotection in organic synthesis.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Photochemistry** Concepts in organic photochemistry, laws of photochemistry, Flurescence and phosphorescence, Quantum yield, Singlet and triplet states, jablonskii diagram, photochemistry of alkenes, photochemistry of carbonyl compounds, Types of photochemical reaction, photo-fries rearrangement.	

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Contents : Unit	Topics	Contact Hours
2	**Carbohydrates** General introduction, monosaccharides (hexoses), preparation and chemical properties of glucose, Chemical reactions of glucose, chain lengthening of saccharides (killiani synthesis), chain shortening of saccharides (ruff method and wohl's degradation method),, Lobery-de-bryn-von Ekanstein rearrangement, epimerisation, cyclic structure of glucose, fructose, and ribose, disaccharides, sucrose, maltose, lactose, polysaccharides, starch, amylose, amylopectin and cellulose.	
3	**Alkalloids and Vitamins and amino acids** Introduction to alkaloids, classification on the basis of sources, on the basis of ring or groups, Chemistry of Papavarine and Colchicine,, Vitamins : Introduction, synthesis and biochemical function of vitamin B(Thiamine), Vitamin H and a-tocopherol (Vitamin E), vitamin C., Introduction, classification, structures of amino acid, isoelectric point, separation of amino acid by electrophoresis, Peptides, peptide bond cleavage reagents, Preparation of amino acids, Nucleic acid, Nucleoside, types of nucleoside, type of nucleotides, types of polynucleotides	
4	**Importance of Protecting groups in Organic Chemistry** Protecting groups for N, O and Sulphur like alcohol, TMSI, TBAF, TBDMS, BnBr, DHP, CbzCl, Boc anhydride, Fmoc-Cl	
Total Hours		

Textbook :

1 A Textbook of Organic Chemistry, R.K. Bansal, New Age International (P) ltd, 2003

2 A Textbook of Organic Chemistry, Bahl Arun , S Chand & Company, 2016

References:

1 Organic chemistry: the fundamental principles, Organic chemistry: the fundamental principles, Finar, I. L., London: Longmans, 1967

2 The Chemistry of the Vitamins, The Chemistry of the Vitamins, Von S. F. Dyke, Wiley & Sons, 1965

3 Principles of Organic Synthesis, Principles of Organic Synthesis, R.O.C Norman, CRC Press, 2009

4 Organic Chemistry, Organic Chemistry, G. Marc. Loudon, Oxford University Press, 2002

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation

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Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

1 The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

4 Use of hazardous/toxic chemicals should be avoided as far as possible in laboratory.

Supplementary Resources:

1 1. http://www.organic-chemistry.org/reactions.htm 2. http://www.organic-chemistry.org/books/ 3. https://www.youtube.com/watch?v=Z_GWBW_GVGA

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