NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CHEMISTRY

COURSE PLAN – PART I			
Name of the programme and specialization	**M.Sc Chemistry**		
Course Title	**Natural Products Chemistry**		
Course Code	**CH 618**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**CH 618**		
Session	**January 2019**	**Section (if, applicable)**	**NA**
Name of Faculty	**Dr. V. Rajeshkumar Dr. Seenuvasan Vedachalam**	**Department**	**Chemistry**
Official Email	**vrajesh@nitt.edu seenuvasanv@gmail.com**	**Telephone No.**	**9087070774 (Dr. VR) 8220462456 (Dr. SV)**
Name of Course Coordinator(s) (if, applicable)	**Dr. V. Rajeshkumar**		
Official E-mail	**vrajesh@nitt.edu**	**Telephone No.**	**9087070774 (Dr.VR)**
Course Type (please tick appropriately)	☐ **Core course**	✓ **Elective course**	

Syllabus (approved in BoS)

CH 618- Natural Products Chemistry

Classification of natural products: Chemical structure, classification, structure elucidation based on degradative reactions- Isolation and structural elucidation of selected alkaloids and terpenes- quinine, morphine, and reserpine, citral,juvabione and logiofolene -Insect pheromones

Aminoacids: Synthesis of amino acids-reactions - properties- Amino Acids in Nature: - Amino Acids and their Metabolites in Nature –Structure of proteins- Peptides,

Steroids– classification- Synthesis and structure elucidation of cholesterol, conversion of cholesterol to progesterone- androsterone and testosterone-cortisone- Vitamin D - Nucleic Acids- structure of nucleosides and nucleotides-RNA and DNA, Watsons and Crick modelDNA-drug interaction

Carbohydrates: Determination of configuration- Hudsons rules-Structure of sugarstransformation of sugars, Preparation of alditols, glycosides, deoxysugars. Synthesis of vitamin C from glucose.

Heterocycles: Synthesis, Properties and uses of Five membered heterocyclic ring systems with one or two hetero atoms-Furan, pyrrole, thiophene and thiazole: six membered

heterocyclic ring system-Pyridine. Fused heterocyclic ring systems- Indole, quinoline. Biologically important heterocycles: Pyrimidines and purines.

References:

1. I. L. Finar, Organic Chemistry Vol. I & Vol. II- Pearson Education, 6thedn.
2. F. A. Carey and R. J. Sundberg, (Eds) 3rd Edition, Part B. Plenum/Rosetta, 1990.
3. I. Fleming, Selected Organic Synthesis, John Wiley and sons, 1982.
4. Atta-ur-Rahman, Studies in Natural Products Chemistry, Vol.1 and 2, Elsevier, 1988.
5. R. Krishnaswamy, Chemistry of Natural Products; A Unified Approach, Universities Press.
6. R. J. Simmonds: Chemistry of Biomolecules: An Introduction, RSC.

COURSE OBJECTIVES

1. To introduce the significant of natural products and their multi-step synthesis, application
2. Learn the Synthesis, Properties and uses of Heterocyclic compounds

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Students will learn about multi-step synthesis in the organic chemistry	
2. It will give the idea about the importance of amino acids proteins and their synthesis.	
3. Acquire the knowledge about the steroids and nucleic acids	
4. Learn about sarbohydrates synthesis and applications	
5. Study about the synthesis and properties of different heterocycles and their uses.	

COURSE PLAN – PART II

COURSE OVERVIEW

This course is offered to II year M.Sc.(Chemistry) students. This 3 credit course is for theory. Three theory classes will be conducted per week.

COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	II week of January	**Classification of natural products: Chemical structure, classification, structure elucidation based on degradative reactions-**	C&T, PPT
2	III week of January	**Isolation and structural elucidation of selected alkaloids and terpenes-quinine, morphine**	C&T, PPT
3	IV week of January	**Reserpine, citral, juvabione and logiofolene –Insect pheromones**	C&T, PPT

4	I week of February	**Aminoacids: Synthesis of amino acids- reactions – properties**	C&T, PPT
5	II week of February	**Amino Acids in Nature: - Amino Acids and their Metabolites in Nature –Structure of proteins- Peptides,**	C&T, PPT
6	III week of February	**Steroids– classification- Synthesis and structure elucidation of cholesterol,**	C&T, PPT
7	IV week of February	**conversion of cholesterol to progesterone- androsterone and testosterone-cortisone- Vitamin D**	C&T, PPT
8	I week of March	**- Nucleic Acids- structure of nucleosides and nucleotides-RNA and DNA, Watsons and Crick modelDNA-drug interaction**	C&T, PPT
9	II week of March	**Carbohydrates: Determination of configuration- Hudsons rules-Structure of sugars**	C&T, PPT
10	III week of March	Transformation of sugars, Preparation of alditols, glycosides, deoxysugars.	C&T, PPT
11	IV week of March	Synthesis of vitamin C from glucose.	C&T, PPT
12	I week of April	Heterocycles: Synthesis, Properties and uses of Five membered heterocyclic ring systems with one or two hetero atoms- Furan, pyrrole, thiophene and thiazole	C&T, PPT
13	II week of April	six membered heterocyclic ring system- Pyridine.	C&T, PPT
14	III week of April	Fused heterocyclic ring systems- Indole, quinoline. Biologically important heterocycles: Pyrimidines and purines	C&T, PPT

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment/Quiz	II week of Feb	One week	5

2	Cycle Test I	IV week of Feb	60 minutes	20
3	Assignment/Quiz	II week of March	One week	5
4	Cycle Test II	IV week of March	60 minutes	20
CPA	Compensation Assessment*	IV week of April	60 minutes	20
5	Final Assessment *	IV week of April	3 h	50

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Feedback from students during class committee meetings.
2. Anonymous feedback through questionnaire at the end of the semester.

COURSE POLICY (including compensation assessment to be specified**)**

1. 75% attendance is compulsory for appearing final assessment.
2. Plagiarism is strictly not allowed.
3. For those students who missed Test I and Test II due to genuine reasons, retest will be conducted during the IIV week of April 2019.
4. Extra classes will be conducted, if attendance is shortage for students.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the

programmes.
ADDITIONAL INFORMATION, IF ANY
FOR APPROVAL
(i) Rajkumar 11-01-19 (ii) V. Seenivasa. 11/01/19 **Course Faculty** _____ **CC- Chairperson** _____ **HOD** _____