INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (CHEMISTRY)**
SEMESTER	**6**
COURSE TITLE	**ADVANCED INORGANIC & INDUSTRIAL CHEMISTRY**
COURSE CODE	**02CY0351**
COURSE CREDITS	**6**

Objective:

1 To study the famous concept symmetry and its introduction.
2 To understand organometallic chemistry.
3 To study the introduction, classification, properties, and preparation of polymer.
4 To study the fertilizers and its introduction.
5 To study the petrochemicals.

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

1 Understand the concepts of term symmetry
2 Be aware of the knowledge of organometallic chemistry.
3 Obtain the information regarding polymer and their applications.
4 Understand the basic of fertilizers.
5 Will get an idea regarding the importance of petrochemicals in current scenario.

Pre-requisite of course: To understand advanced concepts of inorganic and industrial chemistry

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
5	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Symmetry** Introduction, symmetry element, symmetry operation,Equivalent symmetry elements and equivalent atoms, General relations amongst symmetry elements and symmetry operation, symmetry classification of molecules, classes of symmetry operations	
2	**Organometallic chemistry** Introduction, nomenclature of organometallic compounds, ionic organometallic compounds, organometallic compounds of various group, 18 electron rule, counting of effective numbers of electrons, metal carbonyl, metal nitrosyl, nomenclature of organometallic compounds	

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Contents : Unit	Topics	Contact Hours
3	**Polymers** Introduction, classification of polymer, types of polymerisation reaction, addition polymerisation, Ziegler-natta catalysed polymerisation, stereochemistry of polymers, types of plastic, synthesis of Bakelite, phenol formaldehyde, melamine, Teflon, and polychloroprene, Low density polyethylene, high density polyethylene.	
4	**Fertilizers** Introduction, Plant nutrients and its role, Classification of fertilizers, Properties of fertilizers, Nitrogeneous fertilizers like urea, ammonium nitrate, ammonium sulphate, Calcium cyanamide, Phosphate fertilizers like super phosphate, triple super phosphate, mono ammonium phosphate, diammonium phosphate, Potassium fertilizers like potassium chloride, potassium sulphate, potassium nitrate, nomenclature in fertilizer industry.	
5	**Petrochemicals** Introduction, petrochemicals from C1, petrochemicals from C2, petrochemicals from C3.	
Total Hours		

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Experiments** Experiment - 1, Experiment - 2, Experiment - 3, Experiment - 4, Experiment - 5, Experiment - 6, Experiment - 7, Experiment - 8	
Total Hours		

Textbook :

1 A Textbook of Physical Chemistry, K L Kapoor, Macmillan, 2004

2 Industrial Inorganic Chemistry, Karl Heinz Büchel, John Wiley & Sons, 2008

References:

1 Physical Chemistry, Physical Chemistry, Castellan G. W., Narosa Publishing House, 2004

2 Essentials of Physical Chemistry, Essentials of Physical Chemistry, Arun Bahl, S. Chand Publishing, 2022

3 Principal Of Inorganic Chemistry , Principal Of Inorganic Chemistry , K.C. KaliaB.R. PuriL.R. Sharma, VISHAL PUBLISHING CO., 2020

4 Concise Inorganic Chemistry, Concise Inorganic Chemistry, J. D. Lee, John Wiley & Sons, 2008

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					
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. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
4. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory
5. Use of hazardous/toxic chemicals should be avoided as far as possible in laboratory.
6. All students in the laboratory must wear safety goggles and lab coats during lab session.

Supplementary Resources:

1. 1. http://nptel.ac.in/course.php?disciplineId=104 2. http://ocw.mit.edu/courses/chemistry/ 3. http://vlab.amrita.edu/index.php?sub=2 4. https://www.youtube.com/user/TMPChem 5. https://www.youtube.com/channel/UCqk-dmk3AOFtikaFDpsZorg
2. http://ocw.mit.edu/courses/chemistry/
3. http://vlab.amrita.edu/index.php?sub=2
4. http://www.vlab.co.in/ba_labs_all.php?id=9
5. https://www.youtube.com/user/TMPChem
6. https://www.youtube.com/playlist?list=PL166048DD75B05C0D
7. https://www.youtube.com/channel/UCqk-dmk3AOFtikaFDpsZorg
8. https://www.youtube.com/user/PradeepKshetrapal

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