



Model Institute of Engineering
& Technology (Autonomous)
Course Handout

Kot, Bhalwal, Jammu

COURSE HANDOUT COURSE HANDOUT

ENGINEERING CHEMISTRY (BSC-103)

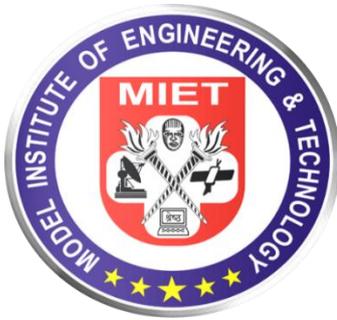
B.E. CE^{1ST} SEMESTER

ACADEMIC YEAR (2024-25)

Dr Kavita Abrol

Assistant Professor

Applied Science and Humanities



Department of Civil Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot-Bhalwal, Jammu - 181122

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Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
BSC-103	Engineering Chemistry	BSC	5	4	0H	1	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Understand the concept of stereochemistry in organic compounds.
CO2	Determine the chemical structure, molecular properties, vulcanization process and types of rubber.
CO3	Gain an understanding of environmental chemistry and methods to control the environmental pollution.
CO4	Select an alloy for a particular application and understand the cement composition process and types of rubber.
CO5	Explain the process of water treatment and determine the hardness of water.

Unit-I Optical isomerism, enantiomerism and diastereoisomerism, racemisation, methods for resolution of racemic mixture, asymmetric synthesis, definition and synthesis of a drug, structure and applications of following drugs antipyretic, narcotics, tranquilizers, antibiotics. Importance and uses of plastics, classification of plastics, types of rubber, treatment of latex, vulcanization of rubber.

(10 Hrs)

Unit II: UV spectroscopy: Principle, laws of absorption, Band nature of UV spectrum, types of electronic transitions, applications. IR spectroscopy: Principle, molecular vibrations, applications. NMR spectroscopy: Principle and applications.

(8 Hrs)

Unit III: Concepts of environment chemistry, segments of environment, types and control of air pollution, classifications and control of water pollution, biochemical effects of Pb, Hg, As, Zn and CN.

(7 Hrs)

Section B

Unit IV: Alloys: Introduction, purpose of making alloys, preparation of alloys, classification of alloys (ferrous and non-ferrous alloys), alloy steels and copper alloys (brass and bronze), cement & its types, manufacture of Portland cement, setting and hardening of cement.

(6Hrs)

Unit V: Water treatment: Introduction, softening of water by lime-soda, zeolite and ion-exchange processes, priming and foaming, sludge and scale formation, determination of hardness of water by EDTA method, numerical on hardness and softening of water. Battery basics, cell chemistry, types of batteries (alkaline, lithium-ion, lead-acid and zinc-carbon battery).

(10 Hrs)

Textbooks

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	,Enggchemistry,	Jain &Jain	,Dhanpat Rai Publishers	15th Edition, 2005



2	Spectroscopy of Organic Compound	P,S.Kalsi	New Publishers	Age	6th Edition, 2004
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Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Environmental Chemistry	A.K.Dey	New International Publisher, Ist Ed	Age 2016
2	Textbook of Engineering Chemistry	S.S.Dara,A	S.Chand&Company, Ist Ed,	1986

COURSE PLAN

Unit-I

S.No	Topics	Recommended Books
1	Optical isomerism, enantiomerism and diastereo isomerism, racemisation, methods for resolution of racemic mixture, asymmetric synthesis	Engineering Chemistry Kirtipublisher, 1st Ed. Pg. No.1-23 e notes http://www.tndte.gov.in/site/wp-content/uploads/2016/08/Engineering-Chemistry.pdf You Tube video https://www.youtube.com/watch?v=vu3xc146rP0 https://www.youtube.com/watch?v=ze8vOcb8clY
2	Definition and synthesis of a drug, structure and applications of following drugs antipyretic, narcotics, tranquilizers, antibiotics	Engg Chemistry Kirtipublisher, 1st Ed. Pg. No.29-37 For e-notes http://www.tndte.gov.in/site/wp-content/uploads/2016/08/Engineering-Chemistry.pdf
3	Importance and uses of plastics, classification of plastics, types of rubber, treatment of latex, vulcanization of rubber	Engg Chemistry Kirtipublisher, 1st Ed. Pg. No.41-59 You Tube video



		https://www.youtube.com/watch?v=0S_bt3JI150
Unit-II		
4	UV Spectroscopy: Principle, laws of absorption, Band nature of UV spectrum, types of electronic transitions, applications.	Engg Chemistry Kirtipublisher, 1st Ed. Pg. No.86-102 You Tube video https://www.youtube.com/watch?v=0S_bt3JI150
5	IR Spectroscopy: Principle, molecular vibrations, applications	Engg Chemistry Kirtipublisher, 1st Ed. Pg. No.102-108 https://youtu.be/4XoVXb9kmEg https://youtu.be/nnVGa8OjkFo
6	NMR Spectroscopy: Principle and applications	Engg Chemistry Kirtipublisher, 1st Ed. Pg. No.108-122 https://www.lkouniv.ac.in/site/wri/tereaddata/siteContent/202004201521035685ranvijay_engg_UV_and_VISIBLE_SPECTROSCOPY.pdf https://youtu.be/RZLew6Ff-JE https://youtu.be/ywR6aLpfjI0
Unit-III		
7	Concepts of environment chemistry, segments of environment	Engg Chemistry Kirtipublisher, 1st Ed. Pg. No.243-55



		<p>Engg Chemistry Kirtipublisher, 1st Ed. Pg. No. 259-81 https://www.youtube.com/watch?v=oONzyciDp5s</p> <p>https://youtu.be/FOi-agcachM</p> <p>Engg Chemistry Kirtipublisher, 1st Ed. Pg. No. 289-300 https://youtu.be/rpfdYoZ-Z5I</p> <p>Engg Chemistry Kirtipublisher, 1st Ed. Pg. No. 303-312</p>
8	Types and control of air pollution	
9	Classifications and control of water pollution Biochemical effects of Pb, Hg, As, Zn and CN	
Unit-IV		
10	Introduction, purpose of making alloys, preparation of alloys	<p>Engg Chemistry Kirtipublisher, 1st Ed. Pg. No. 127-139 e notes http://www.tndte.gov.in/site/wp-content/uploads/2016/08/Engineering-Chemistry.pdf</p> <p>Engg Chemistry Kirtipublisher, 1st Ed. Pg. No. 134-37 Enotes: https://www.rcet.org.in/uploads/files/LectureNotes/ece/S1/CY8151%20-%20</p> <p>https://youtu.be/IEzZrAcNTyw</p> <p>Engg Chemistry Kirtipublisher, 1st Ed. Pg. No. 143-45 Engg Chemistry</p>



		Kirtipublisher, 1st Ed. Pg. No.145-55
11	Classification of alloys (Ferrous and Non-Ferrous alloys), alloy steels and copper alloys (Brass and Bronze)	
12	cement & its types, Manufacture of Portland cement, setting and hardening of cement	
Unit-V		
13	Priming and foaming, sludge & scale formation Determination of hardness of water by EDTA method, Numerical on hardness and softening of water	Engg Chemistry Kirtipublisher, 1st Ed.182-97
14	Introduction, Softening of water by Lime-Soda, zeolite & ion-exchange processes.	Engg Chemistry Kirtipublisher, 1st Ed. Pg.No.175-79 https://youtu.be/XCZakSI-M0I
15	Battery Basics, Cell Chemistry, types of batteries (Alkaline, Lithium-ion, Lead-acid and Zinc-carbon battery)	Engg Chemistry Kirtipublisher, 1st Ed. Pg.No.170-224 e notes http://www.tndte.gov.in/site/wp-content/uploads/2016/08/Engineering-Chemistry.pdf

ADDITIONAL WEB RESOURCES

1.	https://www.youtube.com/watch?v=CWOJW4357Bg
2.	https://www.youtube.com/watch?v=uMzRJD635gE

GRADING AND ASSESSMENT

- **Sessional Test:** 50 marks
- **Assignment:** 20 marks
- **Attendance:** 10 marks

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COURSE POLICIES

- **Attendance:** Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity:** MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions:** Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
Monday (12:05 PM - 12:55 PM)
Friday (12:05 PM - 12:55 PM)
- **Contact Information**
- kavita.ash@mietjammu.in