



Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA

An Autonomous Institute

FACULTY OF ENGINEERING

Department of Basic Sciences & Humanities

Course Structure:

Class	B. Tech.
Course Code and Course Title	0UBHBS111, Engineering Chemistry
Prerequisite/s	-
Teaching Scheme: Lecture/Tutorial/Practical	03/00/00
Credits	03
Evaluation Scheme: ISE/ MSE/ ESE	20/20/60

Course Outcomes (COs): Upon successful completion of this course, the student will be able to:		Bloom's Level
0UBHBS111_1	Apply methods to treat water for hardness in domestic use.	L3
0UBHBS111_2	Utilize the characteristics of fuels and lubricants to access their performance	L3
0UBHBS111_3	Apply electrochemical concepts to conductance analysis, titration techniques, and energy storage systems	L3
0UBHBS111_4	Implement corrosion prevention and protection techniques to minimize material degradation.	L3
0UBHBS111_5	Apply principles of nanomaterial synthesis and photovoltaic cells for technological applications.	L3
0UBHBS111_6	Apply polymerization concepts and polymer properties in engineering applications	L3

Course Contents:		
Unit 1	Water Treatment Introduction, Hard and Soft water, Disadvantages of hard water, Softening of water :Ion exchange process, Hot lime –soda process, Hardness and its determination by EDTA method, Numerical on Hardness, Treatment of water for domestic purpose- aeration, sedimentation and disinfection.	07 Hrs.
Unit 2	Fuels and Lubricants Fuels: Introduction, Classification of fuel, Calorific value of a fuel, Characteristics of a good fuel, Calorific value by- Bomb Calorimeter, Boy's Calorimeter, Numerical on Calorific value. Lubricant: Introduction, classification of lubricant - Solid, Semi –solid and liquid lubricant, Properties of lubricant: Physical and Chemical properties of lubricant – viscosity, surface tension, Acid value.	08 Hrs.
Unit 3	Electrochemistry Introduction, Electrical conductance- Specific & Molar Conductance, Cell constant, Conductometric titrations, Types of reference electrodes – Calomel electrode, Indicator electrode (Glass electrode), Rechargeable Batteries: Lithium ion batteries, H ₂ -O ₂ Fuel Cell.	06 Hrs.



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Unit 4	Corrosion and its Control Introduction, Electrochemical Corrosion (Wet corrosion), Types of Wet corrosion-Galvanic, Microbiological Corrosion, Direct Chemical Corrosion (Dry corrosion), Factors affecting the rate of corrosion, Methods to minimize the rate of corrosion- Cathodic and Anodic protection method.	07 Hrs.
Unit 5	Nanomaterial's & Solar Energy Introduction, Properties of nanomaterial-top-down and bottom-up approach for synthesis of nanomaterial (Carbon Nanotubes, Graphene): Introduction to semiconducting nanomaterial's (ZnO, TiO ₂ etc), Metal nanoclusters (Ag, Pt), Applications of nanomaterial's. Introduction, Photovoltaic cell: Construction, Working, Advantages, Disadvantages & Applications.	08 Hrs.
Unit 6	Polymers Introduction. Types of Polymerization-Addition & Condensation, Thermoplastic and Thermosetting resin, Synthesis of Urea formaldehyde and Styrene-butadiene rubber with its Properties and Uses, Brief discussion on Natural Rubber, Properties and uses of PVC, Bakelite, Epoxy resin.	06 Hrs.
	Total	42

Text Books

Sr. No	Title	Author	Publisher
1	Engineering Chemistry	Dr. Jayashree Parikh	Shivaji University
2	Text Book of Engineering Chemistry	Dr. Savita Garg	Techsar
3	Eng. Chemistry (Fundamentals & Applications)	Shikha Agarwal	Cambridge University
4	Polymer Science	V. R. Gowarikar	New Age International Publication

Reference Books

Sr. No.	Title	Author	Publisher
1	Engineering Chemistry	S. S. Dara & Dr. S. S. Umare	S. Chand
2	Engineering Chemistry	Dr. Savita Garg	Wiley
3	Engineering Chemistry	Jain & Jain	Dhanpat Rai



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4	Engineering Chemistry	Bhaskar Chaurasia	CBS
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E- Learning Resources

Sr. No.	Title	Course Instructor	Platform	Web link
1.	Water and waste water treatment	Prof. Bhanu Prakash Vellanki	NPTEL	https://onlinecourses.nptel.ac.in/noc26_ce72/preview
2.	Solar Cell	Jens Andresen	Coursera	www.coursera.org/learn/solar-cell
3.	Chemistry of Nanomaterials	Dr. SYAMCHAND. S. S	Swayam	https://onlinecourses.swayam2.ac.in/e-learning/preview/cec26_cy05
4.	Engineering Aspects of Biofuels and Biomass Conversion Technologies	Prof. Ejaz Ahmad	Swayam	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ch88
5.	Introduction to Polymer Science	Prof. Dibakar Dhara	Swayam	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cy47

Mapping of CO's with PO's

Course Outcomes	Programme Outcomes										
	1	2	3	4	5	6	7	8	9	10	11
0UBHBS111_1	3	2				2					3
0UBHBS111_2	3					2					2
0UBHBS111_3	3		2			2					2
0UBHBS111_4	3					2					2
0UBHBS111_5	3		2			2	1				2
0UBHBS111_6	3		2			2					2

Course Coordinator

Member Secretary BOS

Chairman BOS