



# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi  
 Accredited by NAAC with "A" Grade  
 Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK,  
 Kakinada  
 SEETHARAMPURAM, W.G.DT., NARSAPUR-534280, (Andhra Pradesh)

### DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

### TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
23BS2T01	CHEMISTRY	II	Common to ECE, IT, AIML, AI&DS	5	2024-25	20.01.2025

#### COURSE OUTCOMES

- CO1: Compare the materials of construction for battery (K2).
- CO2: Apply the principle of Band diagrams in the application of conductors and Semiconductors (K3).
- CO3: Acquire the fundamentals of quantum mechanics and molecular orbital theory (K2).
- CO4: Interpret the preparation, properties, and applications of thermoplastic, thermosetting, elastomers & conducting polymers (K2).
- CO5: Summarize the concepts of Instrumental methods (K2).

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Hour	Delivery Method
<b>I</b> <b>Electro chemistry and Applications</b>	1 / K2	1.1	Electrochemical cell-construction and working of Galvanic cell	T1	1	Lecture / Assignment / Interaction
	1/K2	1.2	Nernst equation and applications	T1	1	
	1 / K2	1.3	cell potential calculations and numerical problems	T1, R1,	1	
	1 / K2	1.4	cell potential calculations and numerical problems	T1, R1,	1	
	1 / K2	1.5	potentiometers-potentiometric titrations (redox titrations)	T2, R3, W2	1	
	1 / K2	1.6	Conductivity cell	T2, R3, W4	1	
	1 / K2	1.7	Concept of conductivity	T1, R2	1	
	1 / K2	1.8	Conductometric titrations (acid-base titrations)	T2, R3	1	
	1 / K2	1.9	Conductometric titrations (acid-base titrations)	T2, R3	1	
	1 / K2	1.10	Primary cells-Zinc-air battery	T1, R1	1	
	1 / K2	1.11	Secondary cells-lithium-ion batteries	T2, R1, W3	1	
	1 / K2	1.12	Working of the batteries including cell reaction	T1, R2	1	
	1 / K2	1.13	Fuel cells, hydrogen-oxygen fuel cell- working of the cells.	T1, R1	1	
	1 / K2	1.14	Polymer Electrolyte Membrane Fuel cell (PEMFC)	T1, R1, W4	1	



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Content beyond Syllabus	1/K2	1.15	Electrochemical sensors-potentiometric sensors with examples, amperometric sensors with examples.	T1, R1, W4	1	
<b>Total</b>					<b>15</b>	
<b>II Modern Engineering materials</b>	2 / K3	2.1	Semiconductors – Introduction,	T1, R2, W1	1	Lecture / Assignment / Interaction
	2 / K3	2.2	Semiconductors basic concept, & application	T2, R3	1	
	2 / K3	2.3	Semiconductor preparation by distillation method.	T1, R1	1	
	2 / K3	2.4	Semiconductor purification by Zone refining.	T2, R1	1	
	2 / K3	2.5	Superconductors-Introduction	T1, R1, W5	1	
	2 / K3	2.6	Superconductors-basic concept, applications	T1, R1	1	
	2 / K3	2.7	Nano materials: Introduction, classification	T1, R1	1	
	2 / K3	2.8	properties and applications of Fullerenes	T1, R2, W6	1	
	2 / K3	2.9	properties and applications of carbon Nanotubes	T1, R1	1	
	2 / K3	2.10	Properties and applications Graphines nano particles.	T1, R3	1	
Content beyond Syllabus	2 / K3	2.11	Supercapacitors: Introduction, Basic Concept-Classification – Applications.	T1, R3	1	
<b>Total</b>					<b>11</b>	
<b>MID I EXAMINATION DURING NINTH WEEK</b>						
<b>III Structure and Bonding Models</b>	3 / K2	3.1	Fundamentals of Quantum mechanics	T1, R1, W1	1	Lecture / Assignment / Interaction
	3 / K2	3.2	Schrodinger Wave equation	T1, R2	1	
	3 / K2	3.3	significance of $\Psi$ and $\Psi^2$	T1, R2	1	
	3 / K2	3.4	Molecular orbital theory	T1, R2	1	
	3 / K2	3.5	Bonding in homo and hetero nuclear diatomic molecules	T2, R2, W3	1	
	3 / K2	3.6	Energy level diagrams of H <sub>2</sub> and calculation of bond order.	T2, R1	1	
	3 / K2	3.7	Energy level diagrams of O <sub>2</sub> and calculation of bond order.	T1, R2, W4	1	
	3 / K2	3.8	Energy level diagrams of CO and calculation of bond order.	T1, R2, W10	1	
	3 / K2	3.9	Energy level diagrams of N <sub>2</sub> and calculation of bond order.	T1, T2	1	
Content beyond the syllabus	3 / K2	3.10	$\pi$ -molecular orbitals of butadiene and benzene, calculation of bond order.	T1, R1, W4	1	



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Total					10
<b>IV Polymer Chemistry</b>	4 / K2	4.1	Introduction to Polymers and types.	T2, R1	1
	4 / K2	4.2	functionality of monomers	T2, R3	1
	4 / K2	4.3	chain growth polymerization	T2, R3	1
	4/K2	4.4	step growth polymerization	T2,R3	1
	4 / K2	4.5	Preparation, Properties and uses PVC and Teflon	T2, R2, W7	1
	4 / K2	4.6	Preparation, Properties and use of Bakelite and Nylon6,6	T2, R2	1
	4 / K2	4.7	Plastics-Thermoplastics and Thermo setting plastics	T1, R1, W10	1
	4 / K2	4.8	Synthetic rubbers: Preparation, properties and uses of Buna-S	T1, R3, W8	1
	4 / K2	4.9	Synthetic rubbers: Preparation, properties and uses of Buna-N	T2, R1	1
	4 / K2	4.10	Conducting polymers- polyacetylene	T2, R2	1
	4 / K2	4.11	Conducting polymers-polyaniline	T1, R1, W9	1
	4 / K2	4.12	Mechanism of conduction and applications.	T1, R1	1
	4 / K2	4.13	Bio-Degradable polymers -PHBV.	T2, R2, W1	1
Content beyond the syllabus	4 / K2	4.14	Poly Glycolic Acid (PGA), Poly Lactic Acid (PLA).	T2, R2, W1	1
<b>Total</b>					<b>14</b>
<b>V Instrumental Methods and Applications</b>	5 / K2	5.1	Electromagnetic spectrum.	T1,T2	1
	5 / K2	5.2	Absorption of radiation	T1, R2, W9	1
	5 / K2	5.3	Beer-Lambert' slaw.	T1, R2	1
	5 / K2	5.4	UV-Visible Spectroscopy	T2,R3, W9	1
	5 / K2	5.5	Electronic transition	T1,T2, W2	1
	5 / K2	5.6	Instrumentation of IR spectroscopies	T2, R1, W6	1
	5 / K2	5.7	Fundamental modes	T1, R2	1
	5 / K2	5.8	selection rules	T2, R3, W4	1
	5 / K2	5.9	Instrumentation	T1, R1,W6	1
Content beyond the syllabus	5 / K2	5.10	Chromatography-Basic Principle, Classification-HPLC: Principle, Instrumentation and Applications	T1, R1,W6	1
<b>Total</b>					<b>10</b>
<b>CUMULATIVE PROPOSED PERIODS</b>					<b>60</b>
<b>MID II EXAMINATION DURING EIGHTEENTH WEEK</b>					
<b>END EXAMINATIONS</b>					
<b>Text Books:</b>					
<b>S.No.</b>	<b>AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION</b>				
1.	Jain and Jain,Engineering Chemistry, 16/e, Dhanpat Rai, 2013.				
2.	Peter Atkins, Juliode Paulaand James Keeler,Atkins' Physical Chemistry,10/e,Oxford University Press, 2010.				



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Reference Books:	
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1.	Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
2.	D. Lee, Concise Inorganic Chemistry, 5 <sup>th</sup> Edition, Wiley Publications, Feb.2008.
3.	Fred W.Billmeyer Jr. Textbook of Polymer Science, 3 <sup>rd</sup> Edition, 2007.
Web Details	
1.	chemicalelements.com
2.	chemistry-chemists.com
3.	americanchemistry.com
4.	organic-chemistry.org
5.	chemicalaid.com
6.	chemgapedia.de
7.	chemistryworld.com
8.	sciencenotes.org
9.	chemieonline.de
10.	sciencemadness.org

		Faculty Name	Signature with Date
i.	Faculty I (for common Course)	Dr. Ch. Venkateswara Rao	Ch. Venkateswara Rao 31/01/25
ii.	Faculty II (for common Course)	Mr. K. SrinivasaRao	KSR 31/01/25
iii.	Faculty IV (for common Course)	Mr. M. V. Krishna Mohan	M. V. Krishna Mohan 31/01/25
iv.	Faculty V (for common Course)	Ms. G. Naga Soundarya	G. Naga Soundarya 31/01/25
v.	Faculty VI (for common Course)	Mr. D. NageswaraRao	D. Nageswara Rao 31/01/25
vi.	Faculty VIII (for common Course)	Mrs. M. Prasanthi	M. Prasanthi 31/01/25
vii.	Course Coordinator	Mr. K. SrinivasaRao	KSR 31/01/25
viii.	Programme Coordinator	Dr. V. Swaminadham	V. Swaminadham

Principal