

K.S.R.M COLLEGE OF ENGINEERING

UGC-Autonomous Kadapa,AP

www.ksrmce.ac.in

Lr./KSRMCE/Principal Office /2019-20/

Dated: 25-06-2019

Principal Office Orders

As per the decisions of the Academic Council meeting held on 15- 06 –2019 the undersigned members are been appointed as the Board of studies for Chemistry for a period of 2 years.

S.No.	Name	Designation
1.	Dr. I. Sreevani	Asso.Prof., & HOD H&S, KSRMCE
2.	Dr. R. Jajib Biswas	Assistant Prof., IIT , Tirupati
3.	Dr. C. Suresh Reddy	Prof.,SVU college of sciences, KSRMCE
4.	Prof. G. V. Subba Reddy	Vice Principal, JNTUA Pulivendula
5.	Smt. V. Sudha	Alumni
6.	Smt. M. Mary Jasmine	Assistant Prof., KSRMCE
7.	Dr.K.Venkataramana	Assistant Prof., KSRMCE
8.	Smt.B.Prasanthi	Assistant Prof., KSRMCE
9.	Sri. G. Ashok	Industry Expert

The orders will come in to force for with immediate effect.

V. S. S. MW/9

Principal PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING KADAPA - 515 003. (A.P.)

Cc to:

The Management/ Director for information
The HoD of H&S for recessary actions
The Members for Information
The Website Committee for upload

Date: 06.01.2021

Dear Sir / Madam

Sub:K.S.R.M. College of Engineering (Autonomous), Kadapa - Online BOS meeting on 10.01.2021 (Sunday) -Intimation - Reg.

00000

Greetings from K.S.R.M. College of Engineering and wish you a very happy and prosperous New Year. Hope you are doing well during this COVID period. I am pleased to inform that we are going to conduct BOS meeting (online - through Google meet) on 10.01.2021. The agenda of the meeting is as follows:

- 1. Common Board of studies meeting from 10.00 AM- 11.00 AM.
 - To discuss about R20 UG Regulations and Curriculum of I and II Semester of B.Tech.
 - Feedback from Stakeholders if any.
- 2. Individual Board meetings from 11.30 AM onwards.

request you to attend the meeting and give your valuable suggestions and inputs.

With Regards, V. 2.5.

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING

Encl.:Draft copy of B.Tech R20 UG Regulations and Curriculum. KADAPA - 516 003. (A.P.)

KSRMCE Principal

Organizer

anil.vuppala@iiit.ac.in *

arpitha@ksrmce.ac.in

ddsrengineer@gmail.com *

drkvgreddy@gmail.com *

drybkumar@gmail.com *

eswar@ksrmce.ac.in

cswar@ksimce.ac.iii

gopireddy.chemistry@jntua.ac.in *

haripriya.iitr@gmail.com *

kalyankumar@ksrmce.ac.in

karetichiranjeevi@gmail.com *

khizar@ksrmce.ac.in

kiranced@ksrmce.ac.in

Prof.K.Rama Naidu *

ksr@ksrmce.ac.in

Outside working hours

Bingi Manorama

Bhaskar Reddy

mcs@ksrmce.ac.in

Outside working hours

M V Narayana

Nagendrababu Giddaluri

nbreddy@ksrmce.ac.in

pasha.ece@ksrmce.ac.in

rajendra.p@ksrmce.ac.in

Outside working hours

ravikumar@iith.ac.in *

rsreddy@iitm.ac.in *

RV Sreehari

Outside working hours

shobabindhu.cse@jntua.ac.in *

Prathapa Reddy Singathala L

sreedhar.g@ksrmce.ac.in

sudha@ksrmce.ac.in

Suresh Praveen

Outside working hours

sureshace@ksrmce.ac.in

Outside working hours

vlreddy@ksrmce.ac.in

khasimmba@ksrmce.ac.in

girish.meruva@gmail.com *

anand@ksrmce.ac.in

bayineni@gmail.com *

bhaskark@ksrmce.ac.in

chitra.hss@jntua.ac.in *

csrsvu@gmail.com *

KSRMCE Director

diram@iitm.ac.in *

dmkreddy@ksrmce.ac.in

Venkata Ramana Reddy Busireddy

drgiridhar@ksrmce.ac.in

drkvr@ksrmce.ac.in

durga.mech@jntua.ac.in *

durgaprasad@ksrmce.ac.in

Outside working hours

evmreddyin@yahoo.co.in

gcvsubbaiah@ksrmce.ac.in

ibchyd@gmail.com

jasmine@ksrmce.ac.in

jsuresh@ksrmce.ac.in

k4161007@yahoo.co.in

keshava.maths@jntua.ac.in

kiranmayi.eee@jntua.ac.in

knreddyr@gmail.com

krishnamohan.inventions@gmail.com

ktrjntu@gmail.com

Madhavi K

mangalinagendrakumar@bel.co.in

mariprasath@ksrmce.ac.in

nnk@iittp.ac.in

pkkreddy@ksrmce.ac.in

pradeep.u@ksrmce.ac.in

prathap@ksrmce.ac.in

Malli Avutala

puttapdm@gmail.com

radhagajjala@ksrmce.ac.in

raghukanth@iitm.ac.in

RAGHUNATHA REDDY N

rajesh.mamilla@vit.ac.in

rajib@iittp.ac.in

rajugss@yahoo.com

ramachandra reddy

ramamohanreddy@ksrmce.ac.in

ramanareddy@ksrmce.ac.in

Ramanjaneya Reddy Nalavala

ramesh.k@ksrmce.ac.in

rathnamma@ksrmce.ac.in ratnamgy2003@gmail.com

rbvs66@nitw.ac.in

Ramabhupal Reddy

rrk@ksrmce.ac.in

satheesh.y@ksrmce.ac.in

Selvaraj N

shobabindhu@gmail.com

sreedhar.c01@infosys.com

sreedhar_ukkalam@yahoo.com

sreenivas.p@ksrmce.ac.in

sudarsanarao.civil@jntua.ac.in

sudarsanarao123@gmail.com

svpnetworks14@gmail.com

tabassum@ksrmce.ac.in

Dr. Vaishali G Ghorpade

valli@ksrmce.ac.in

Outside working hours

varaprasad.cse@bmsce.ac.in

veerasankar@ksrmce.ac.in

vramesh@ksrmce.ac.in

vrkm@physics.iitm.ac.in

zahir@ksrmce.ac.in

heads.all@ksrmce.ac.in (6)



BOARD OF STUDIES MEETING – 2020-21 K.S.R.M COLLEGE OF ENGINEERING AUTONOMOUS

Minutes of the Meeting

Date	10.01.2021	Day	Sunday
Time	11 AM	Venue	Virtual meeting: https://meet.google.com/kts-uxuf-hwe
Dept./SS	Humanities and Sciences (Chemistry)	Convener	Dr.I.Sreevani

Mem	bers Present: 07			Mem	Members Absent: 00			
S.No	Name	Designation	Signature	S.No	Name	Designation		
. 이 전화 본 등 마음 마음 이 시간 사람들은 사람들이 되었다. 그 작은 사람들이 하다던데		Associate Prof., HOD, Dept. of H&S, KSRMCE	A	1.	G. Ashok	Representative from Industry, Railway Kodur.		
2.	Prof.G. V. Subba Reddy	Vice-Principal, JNTUP						
3.	Prof. C. Suresh Reddy	Prof., of Chemistry, Dept. of Chemistry, SV University						
4.	Dr.Rajib Biswas	Assistant Prof, IIT, Tirupathi.						
5.	Smt. M.Mary Jasmine	Assistant Prof., KSRMCE	aner					
6.	Dr.K.Venkata Ramana	Assistant Prof., KSRMCE	De la constantina della consta					
7.	Smt. B. Prashanti	Assistant Prof., KSRMCE	BP					
8.	V. Sudha	Assistant Prof., KSRMCE (Alumni Member)						

There solutions are:

	Todo item	Discussion	Resolution	Coordinator/in- charge
1	and syllabus for I Sem & II Sem B.Tech under R20 Regulations.	comparing with premier institute syllabus.	g modifications in Chemistry (CSE, EEE d & ECE) & Engineering Chemistry (CE & ME) theory & Lab. has approved.	
2.	To finalize the curriculum and syllabus for II Sem B.Tech Mandatory course under R20 Regulations.	The Board of Chairman has presented the syllabus designed by the faculty after taking the feedback from all stakeholders and comparing with premier institute syllabus.	e The committee has approved g Environmental Science syllabus for II d Sem (CE, EEE & ECE).	Dr.I.Sreevani
3.	To finalize the open electives for V, VI, VII, VIII Sem B.Tech under R18 regulations.	The Board of Chairman has presented the syllabus designed by the faculty after taking the feedback from all stakeholders and comparing with premier institute syllabus.	e The committee has approved the open g electives with few suggestions in d syllabus for V, VI, VII & VIII Sem B.Tech.	Dr.I.Sreevani
4.	To finalize and approve the syllabus for Certificate Courses.	The Board of Chairman has presented the syllabus designed by the faculty after taking the feedback from all stake holders and comparing with premier institute syllabus.	The committee appreciated the courses and approved the content for offering Certificate Courses to implement in 2020-21.	Dr.I.Sreevani
5.	To finalize and approve the syllabus for Bridge course	The Board of Chairman has presented the syllabus designed by the faculty after taking feedback from all stake holders.	The committee has approved the syllabus	Dr.I.Sreevani

The Head of the Department have proposed the Vote of thanks and concluded the meeting.

Dor LISREW ANT M.Sc. Ph. D. Convener M. Sc. Ph. D. Hpad of Humannies & Sciences KRS M. College of Engineering 8

PRINCIPAL
PRINCIPAL
K.S.R.M. COLLEGE OF ENGINEERIN
KADAPA - 515 033 (A.P.)

Course Title	ENGINEE	RING	СНЕМ	ME	Tech. C(I Sem) (II Sem)				
Course Code	Category	H	ours/W	eek	Credits	Maximum Marks			
20EC102 (I Sem) 20EC202 (II Sem)	BSC	L	Т	P	C	Continuous Internal Assessment	End Exams	Total	
		3	1	0	3	40	60	100	
Mid Exam Duratio		End Exam	Duratio	n: 3Hrs					

- To familiarize engineering chemistry and its applications
- To impart the concept of soft and hard waters, softening methods of hard water
- To train the students on the principles and applications of electrochemistry, polymers, surface chemistry, and cement.

Course Outcomes (CO)

CO	On successful completion of this course, the students will be able to
CO 1	Evaluate the amount of hardness and dissolved oxygen present in water sample.
CO 2	Demonstrate the corrosion prevention methods and factors affecting corrosion.
CO 3	Explain the preparation, properties, and applications of thermoplastics & thermosetting, Elastomers & conducting polymers
CO 4	Understand the setting and hardening of cement and concrete phase.
CO 5	Analyze the concepts of colloids, micelle and nanomaterials.

Unit 1: Water Technology (10 hrs)

Introduction –Soft Water and hardness of water, hardness of water by EDTA Method, Estimation of dissolved oxygen (Winkler's method)-Boiler troubles –Priming, foaming, scale and sludge, Caustic embrittlment, Industrial water treatment – specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards, ion-exchange processes - desalination of brackish water, reverse osmosis (RO) and electro dialysis.

Learning outcomes:

The student will be able to

- List the differences between temporary and permanent hardness of water
- Explain the principles of reverse osmosis and electro dialysis
- Compare quality of drinking water with BIS and WHO standards
- Illustrate problems associated with hard water scale and sludge
- Explain the working principles of different Industrial water treatment processes

Unit 2: Electrochemistry and Applications: (10 hrs)

Introduction to electrodes – concepts, electrochemical cell, Nernst equation, cell potential calculations.

Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad), and lithium ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogen-oxygen, methanol fuel cells – working of the cells.

Corrosion: Introduction to corrosion, electrochemical theory of corrosion, differential aeration cell corrosion, galvanic corrosion, metal oxide formation by dry electrochemical corrosion, Pilling Bed worth ratios and uses, Factors affecting the corrosion, Cathodic and anodic protection, electroplating and electro less plating (Nickel and Copper).

Learning Outcomes:

At the end of this unit, the students will be able to

- Apply Nernst equation for calculating electrode and cell potentials
- Apply Pilling Bed worth rule for corrosion and corrosion prevention
- Demonstrate the corrosion prevention methods and factors affecting corrosion
- Compare different batteries and their applications

Unit 3: Polymers and Fuel Chemistry: (8 hrs)

Introduction to polymers, Polymer dispersion index, functionality of monomers, Mechanism of chain growth, step growth and coordination polymerization.

Thermoplastics and Thermo-setting plastics-: Preparation, properties and applications of poly styrene. PVC and Bakelite

Elastomers - Preparation, properties and applications of Buna S, Buna N, Thiokol

Fuels – Types of fuels, calorific value, numerical problems based on calorific value; Analysis of coal, Liquid Fuels refining of petroleum, fuels for IC engines, knocking and anti-knock agents, Octane and Cetane values, cracking of oils; alternative fuels- propane, methanol and ethanol, bio-fuels.

Learning Outcomes:

At the end of this unit, the students will be able to

- Explain different types of polymers and their applications
- Solve the numerical problems based on Calorific value
- Select suitable fuels for IC engines
- Explain calorific values, octane number, refining of petroleum and cracking of oils

UNIT-4 Advanced Engineering Materials (10 hrs)

Refractories- Classification, Properties, Factors affecting the refractory materials and Applications.

Lubricants- Classification, Functions of lubricants, Mechanism, Properties of lubricating oils – Viscosity, Viscosity Index, Flash point, Fire point, Cloud point.

Building materials- Portland cement, constituents, phases and reactivity of clinker, Setting and Hardening of cement.

Learning Outcomes:

At the end of this unit, the students will be able to

- Identify the factors affecting the refractory material
- Illustrate the functions and properties of lubricants
- Demonstrate the phases and reactivity of concrete formation
- Identify the constituents of Portland cement

• Enumerate the reactions at setting and hardening of the cement

Unit 5: Surface Chemistry and Applications: (10 hrs)

Introduction to surface chemistry, colloids, micelle formation, synthesis of colloids (Dispersion method), chemical and electrochemical method (chemical vapour deposition) of preparation of nano metals and metal oxides, stabilization of colloids and nanomaterials by stabilizing agents, applications of colloids and nanomaterials –medicine.

Learning Outcomes:

At the end of this unit, the students will be able to

- Summarize the concepts of colloids, micelle and nanomaterials
- Explain the synthesis of colloids with examples
- Outline the preparation of nanomaterials and metal oxides
- Identify the application of colloids and nanomaterials in medicine

Text Books:

- 1. A textbook of Engineering chemistry by Shashi Chawla, Dhanpat Rai & Co publications
- 2. Text Book of Physical Chemistry, Samuel Glasstone, Mcmillian publications.
- 3. Textbook of Polymer Science, Third Edition, Fred W. Billi Meyer, TR, A Wiley-Inter Science Publications.
- 4. An Introduction to Electrochemistry, Glasstone, Arihant Publications.

Reference Books:

- 1. Textbook of Engineering Chemistry, Jain and Jain, DhanpatRai& Co publications, 2013
- 2. D.J. Shaw, Introduction to Colloids and Surface Chemistry, Butterworth-Heineman, 1992.
- 3. Water Technology, 2nd Edition, N.F. Gray, Elsevier publications, 2005.
- 4. H.F.W. Taylor, Cement Chemistry, 2/e, Thomas Telford Publications, 1997.

Dr. I. SKEEVANI M.Sc., Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA 516 005

V. S.S. MWY

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING

KADAPA - 516 003. (A.P.)

Course Title		CHI	EMISTI	CSI	. Tech. E (I Sem) ECE (II S	em)		
Course Code	Category	Hours/Week Credits				Maxin	num Marl	KS
2023102 (I Sem) 2023202 (II Sem)	BSC	L	Т	P	C	Continuous Internal Assessment	End Exams	Total
		3	1	0	3	40	60	100
Mid Exam Duration: 2Hrs End						Duration: 31	Irs	

- To familiarize engineering chemistry and its applications.
- To train the students on the principles and applications of electrochemistry and polymers.
- To introduce instrumental methods, molecular machines and switches.

Course	Outcomes: On successful completion of this course, the students will be able to
CO.1	Understand the basic quantum approach of Molecular orbital theory and calculation of
	bond order
CO.2	Remember the principle of Band diagrams in application of conductors and
	semiconductors.
CO.3	Compare the materials of construction for battery and electrochemical cells.
CO.4	Explainthe preparation, properties, and applications of thermoplastics & thermosetting,
	Elastomers & conducting polymers
CO.5	Analyze the principles of spectroscopy and different application of analytical instruments.

Unit 1: Structure and Bonding Models: (10 hrs)

Planck's quantum theory, dual nature of matter, Schrodinger equation, significance of Ψ and Ψ^2 , applications to hydrogen, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules – energy level diagrams of O_2 , NO and CO, etc., calculation of bond order.

Learning Outcomes:

At the end of this unit, the students will be able to

- apply Schrodinger wave equation to hydrogen atom.
- illustrate the molecular orbital energy level diagram of different molecular species.
- explain the calculation of bond order of O₂, NO and CO molecules.
- discussthe basic concept of molecular orbital theory

Unit 2: Modern Engineering materials: (10 hrs)

- i). Understanding of materials: Crystal field theory salient features splitting in octahedral, tetrahedral and square planar geometry. Properties of coordination compounds-Oxidation state, coordination, magnetic properties and colour.
- ii). Semiconductor materials, super conductors- basic concept, band diagrams for conductors, semiconductors and insulators, Effect of doping on band structures.
- iii). Nanochemistry: Introduction, classification of nano materials, properties and applications of Fullerenes, carbonnano tubes and Graphines nanoparticles.

Learning Outcomes:

At the end of this unit, the students will be able to

- Explain splitting in octahedral and tetrahedral geometryof complexes.
- Discuss the magnetic behavior and colour of coordination compounds.
- Explain the band theory of solids for conductors, semiconductors and insulators
- Demonstrate the application of Fullerenes, carbon Nano tubes and Graphines nanoparticles.

Unit 3: Electrochemistry and Applications: (10 hrs)

Introduction to Electrodes – concepts, reference electrodes (Calomel electrode, Ag/AgCl electrode and glass electrode); Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, Potentiometry- Potentiometry titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations), pH metric concepts.Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad),and lithium ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogenoxygen, methanol fuel cells – working of the cells.

Learning Outcomes:

At the end of this unit, the students will be able to

- Apply Nernst equation for calculating electrode and cell potentials
- Differentiate between ph metry, Potentiometry and conductometric titrations
- Explain the theory of construction of battery and fuel cells
- Solve problems based on cell potential

Unit 4: Polymer Chemistry: (10 hrs)

Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, copolymerization (stereospecific polymerization) with specific examples and mechanisms of polymer formation.

Plastics - Thermoplastics and Thermosettings, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6.

Elastomers-Buna-S, Buna-N-preparation, properties and applications.

Conducting polymers - polyacetylenes, - mechanism of conduction and applications.

Learning Outcomes:

At the end of this unit, the students will be able to

- explain the different types of polymers and their applications
- explain the preparation, properties and applications of Bakelite, Nylon-6,6,
- describe the mechanism of conduction in conducting polymers
- discussBuna-S and Buna-N elastomers and their applications

Unit 5: Instrumental Methods and Applications (10 hrs)

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. Regions of Electromagnetic radiation. UV-Visible, IR Spectroscopes'- (selection rules, principles and applications). Solid-Liquid Chromatography-TLC, retardation factor.

Learning outcomes:

After completion of Unit V, students will be able to:

- Explain the different types of spectral series in electromagnetic spectrum
- Understand the principles of different analytical instruments
- Explainthe different applications of analytical instruments

Text Books:

- 1. A textbook of Engineering chemistry by Shashi Chawla, Dhanpat Rai & Co publications 2. Atkins' Physical Chemistry, Peter Atkins, Julio de Paula and James Keeler, Oxford University Press, 2010.
- 3. Textbook of Polymer Science, Third Edition, Fred W. Billi Meyer, TR, A Wiley-Inter Science **Publications**
- 4. An Introduction to Electrochemistry, Glasstone, Arihant Publications.

Reference Books:

- 1. Textbook of Engineering Chemistry, Jain and Jain, DhanpatRai& Co publications, 2013 2. New Concise Inorganic Chemistry, 5th Edition, J. D. Lee, Oxford University Press, 2008.
- 3. Principles of Instrumental Analysis,6th edition, Douglas A. Skoog, Cengage Publications.
- 4. Advanced Inorganic Chemistry, Cotton F Albert, Wilkinson Geoffrey, Prism Publications

EEVANI M.Sc., Ph.D. Head of Humanities & Sciences KSRM College of Engineering KADAPA - 516 005

V. S.S. Muly PRINCIPAL K.S.R.M. COLLEGE OF ENGINEERING KADAPA - 515 003. (A.P.)

Course Title	ENVIRON	NMEN	ITAL S	B. Tech. CE, ECE, EEE (II Sem) ME & CSE (III Sem)				
Course Code	Category	Hours/Week C			Credit s	Maxim	um Mar	ks
20MC210(II Sem) 20993M1 (III	MC	L T P		С	Continuou s Internal Assessment	End Exam s	Total	
Sem)		3			0	40	-	-

- To make the students to get awareness on environment.
- To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life.
- To save earth from the inventions by the engineers.

Course	Course Outcomes: On successful completion of this course, the students will be able to							
CO 1	Explain multidisciplinary nature of environmental studies and various Renewable							
	and Nonrenewable resources.							
CO 2	Understand the Energy flow, bio-geo chemical cycles and ecological pyramids							
CO 3	Illustrate various causes of pollution and related preventive measures.							
CO 4	Summarize Solid waste management, Social issues related to environment and their							
	protection acts.							
CO 5	Evaluate Causes of population explosion, value education and welfare programmes.							

UNIT-I

Multidisciplinary Nature Of Environmental Studies: -Scope and Importance - Need for Public Awareness.

Natural Resources: Renewable and non-renewable resources – Natural resources and associated problems

Forest resources: deforestation, case studies – Mining, dams and other effects on forest and tribal people

Water resources: Use and over utilization of surface and ground water conflicts over water. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

Energy resources: Renewable & Non-Renewable.

Learning Outcomes

- Explain the importance of public awareness
- List the various natural resources

UNIT-II

Ecosystems: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Food chains, food web-Ecological succession and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem.
- b. Desert ecosystem
- c. Aquatic ecosystems (lakes, rivers and oceans)

Biodiversity And Its Conservation : Introduction, Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Learning Outcomes:

- Understand different types of eco systems and their characteristics.
- Classify types of biodiversity and its conservation methods.

UNIT - III

Environmental Pollution: Definition, Cause, effects and control measures of:

- a. Air Pollution.
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

Learning Outcomes:

- Identify various sources of pollution and solid waste along with preventive measures
- Explain the different types of disasters and their managerial measures.

UNIT - IV

Social Issues And The Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents. Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act.

Learning Outcomes:

- Outline the social issues related to environment and their protection acts.(L2)
- To know about wild life protection, forest conservation act and conservation of natural resources (L2)

UNIT-V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health.

Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain — Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds — river, hill slopes, etc.

Learning Outcomes:

- Illustrate about the population explosion and family welfare programmes.(L2)
- To identify the natural assets and related case studies.(L3)

TEXT BOOKS:

- 1. Text book of Environmental Studies for Undergraduate Courses, Erach Bharucha for University Grants Commission, Universities Press.
- 2. Fundamental Concepts of Environmental Chemistry-Sodhi G S Oxford University
- 3. Environmental Chemistry- Anil Kumar De-Willey Publications
- 4. Environment Impact Assessment- Larry W. Canter- Mc Graw Hill publications

REFERENCES:

- 1. G. R. Chatwal, "A Text Book of Environmental Studies" Himalaya Publishing House
- 2. Gilbert M. Masters and Wendell P. Ela, "Introduction to Environmental Engineering and Science, Prentice hall of India Private limited.
- 3. Environmental Science, A Global Concerns, William P. Cunningham, Mary Ann Cunningham, Mc Graw Hill publications.
- 4. Environmental Science & Engineering, Glynn Henry J ,Heinke Gary w, Pearson publications

Dr. I. SREEVANI M.Sc., Ph.D.
Head of Humanities & Sciences
KSR.M College of Engineering
KADAPA-516 005

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING

KADAPA - 516 003. (A.P.)

Course Title	СНЕМ	IISTR	RY LA	В		B. Tech CSE (I Se E, EEE (I	em)	
Course Code	Category	Category Hours/Week Credit s					aximum N	Marks
2023107 (I Sem) 2023207 (II Sem)	BSC	L	Т	P	С	Continuou s Internal Assessment	End lab Exam s	Total
		0	0	3	1.5	40	60	100
							Duration	n: 3Hrs

- To verify the fundamental concepts with experiments.
- The student will have exposure to various experimental skills and hand-on experience which is very essential for an Engineering student.

Course (Outcomes: At the end of the course, the students will be able to							
CO 1	CO 1 Determine the cell constant, emf and conductance of solutions.							
CO 2	O 2 Prepare advanced polymer Bakelite							
CO 3	Evaluate the strength of an acid & ferrous iron.							
CO 4	Illustrate chromatographic technique, IR Spectra and absorption of light.							
CO 5	Explain acid-base titrations using pH meter & conductometer							

Note: In the following list, out of 12 experiments, any 8 experiments must be performed in a semester

List of Experiments:

- 1. Conductometric titration of strong acid vs. strong base.
- 2. Conductometric titration of weak acid vs. strong base
- 3.pH metric titration of strong acid vs. strong base.
- 4. pH metric titration of weak acid vs. strong base
- 5. Determination of cell constant and conductance of solutions
- 6. Potentiometry determination of redox potentials and emfs
- 7. Determination of Strength of an acid in Pb-Acid battery
- 8. Preparation of Bakelite.
- 9. Verify Lambert-Beer's law
- 10. Thin layer chromatography
- 11. Identification of simple organic compounds by IR.
- 12. Preparation of nanomaterial's by precipitation
- 13. Estimation of Ferrous Iron by Dichrometry.

Textbooks:

- 1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et.al., Pearson Education, Sixth Edition, 2012.
- 2.Laboratory manual on Engineering Chemistry, Anupama Rajput, Dhanpat Rai& Co Publications.
- 3. Essentials of Experimental Engineering Chemistry, Shashi Chawla, Dhanpat Rai& Co Publications.

Reference Books:

- 1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
- 2. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.
- 3. Essentials of Physical Chemistry, Bhal & Tuli. (S. Chand Publications).
- 4. Advanced Inorganic Analysis, Agarwal & Keemtilal (Pragati prakashan)

Dr. I. SREEVANI M.Sc., Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA 516 005

PRINCIPAL
K.S.R.M. COLLEGE OF ENGINEERING
KADAPA - 515 003. (A.P.)

Course Title	ENGINE:	ERIN	G CHI	B. Tech. ME (I Sem) CE (II Sem)						
Course Code	Category	Hours/Week Cred			Credit s	Maxim	um Mar	ks		
20EC107(I Sem) 20EC207(IISem)	BSC	L	Т	P	C	Continuou s Internal Assessment	End lab Exam s	Total		
				0	0	3	1.5	40	60	100
		End Exam	Duratio	n: 3Hrs						

- To verify the fundamental concepts with experiments.
- The student will have exposure to various experimental skills and hand-on experience which is very essential for an Engineering student.

The second secon							
Course	Course Outcomes: At the end of the course, the students will be able to						
CO 1	CO 1 Determine the cell constant and conductance of solutions by using conductometer &						
	pH meter						
CO 2	Synthesis of advanced polymer materials						
CO 3	Compare the physical properties like adsorption and viscosity.						
CO 4	Evaluate the Iron and Calcium in cement.						
CO 5	Estimate the hardness & dissolved oxygen content in water.						

Note: In the following list, out of 12 experiments, any 8 experiments must be performed in a semester

List of Experiments:

- 1. Determination of Hardness of a groundwater sample.
- 2. Estimation of dissolved oxygen by Winkler's method
- 3. pH metric titration of strong acid vs. strong base.
- 4. pH metric titration of weak acid vs. strong base
- 5. Determination of cell constant and conductance of solutions
- 6. Potentiometry determination of redox potentials and emfs
- 7. Determination of Strength of an acid in Pb-Acid battery
- 8. Preparation of a polymer (Bakelite).
- 9. Determination of percentage of Iron in Cement sample by colorimetry
- 10. Estimation of Calcium in port land Cement
- 11. Preparation of nanomaterials by precipitation.
- 12. Adsorption of acetic acid by charcoal
- 13. Determination of percentage Moisture content in a coal sample
- 14. Determination of Viscosity of lubricating oil by Redwood Viscometer 1.
- 15. Determination of Viscosity of lubricating oil by Redwood Viscometer 2.

Textbooks:

- 1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et.al., Pearson Education, Sixth Edition, 2012.
- 2.Laboratory manual on Engineering Chemistry, Anupama Rajput, Dhanpat Rai& Co Publications.
- 3. Essentials of Experimental Engineering Chemistry, Shashi Chawla, Dhanpat Rai& Co Publications.

Reference Books:

- 1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
- 2. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.
- 3. Essentials of Physical Chemistry, Bhal & Tuli. (S. Chand Publications).

4. Advanced Inorganic Analysis, Agarwal & Keemtilal (Pragati prakashan)

Dr. I. SREEVANI M.Sc., Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA-516 005

V. L. S. MW/Y

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING

KADAPA - 516 003. (A.P.)

Course Title	Basics of Nanotechnology					B. Tech. (Open elective) VI Sem		
Course Code	Category	Hours/Week C			Credit s	Maxim	ıum Mar	ks
180E2603	Open Elective	L	T	P	С	Continuou s Internal Assessment	End Exam s	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2Hrs						End Exam	Duratio	n: 3Hrs

- To make the students acquire an understanding the Nanoscience and Applications
- Student will be able to understand and control matter at the nanoscale leads to a revolution in technology and industry that benefits society.

Course	Course Outcomes: On successful completion of this course, the students will be able to						
CO 1	Acquire knowledge about structure and properties of nano materials						
CO 2	2 Synthesize and deposit nanomaterials by various methods.						
CO 3	Identify and understand various top-down and bottom-up approaches for nanomaterial synthesis						
CO 4	Correlate properties of nanostructures with their size, shape						
CO 5	Appreciate enhanced sensitivity of nanomaterial-based sensors and their novel applications in industry						

Unit-I: Introduction

History and Scope, Introduction to nanomaterials, Classification of nanomaterials with suitable examples, Structure of different nanomaterials- Graphines, CNT's, Fullerence, Properties of nanomaterials.

Learning Outcomes:

At the end of the unit, The students will be able to

- Classification of nanomaterials.
- Identify different structures of nanomaterials.

Unit-2: Synthesis of Nanomaterials

Chemical precipitation and Co-precipitation, Sol-gel synthesis, Electrochemical synthesis, Photochemical synthesis, Evaporation method

Learning Outcomes:

At the end of the unit, The students will be able to

- Explain Sol-gel method.
- Discuss electrochemical and chemical methods of synthesis.

Unit-3: Fabrication of Nanomaterials

Top-Down method (Ball milling), Bottom-up method (chemical vapour deposition method, Sol gel method), Self- assembly method, Electric arc method.

Learning Outcomes:

At the end of the unit, The students will be able to

• Explain methods used in fabrication of different nanomaterials

Unit-4: Properties of Nanomaterials

Importance of nano particle, effect of Size on optical, electronic, photonic, mechanical, magnetic and catalytic properties.

Learning Outcomes:

At the end of the unit, The students will be able to

- Explain the importance of nano particles.
- Discuss the effect of size on different properties.

Unit-5: Applications of Nanomaterials

Nano particles and Nanocomposites; Nanotubes, Fullerenes, Nano sensors, Nano-electronics, Nano-medical applications, Textiles, paints, Defence & Space applications

Learning Outcomes:

At the end of the unit, The students will be able to

• Know the applications of nanomaterials in different fields.

Textbooks:

- 1. Text Book of Engineering Chemistry, Shashi Chawla, Dhanapath Rai Publications, New Delhi, 4th Edition, 2011.
- 2. Textbook of Nanoscience and Nanotechnology in Engineering, Marcel Van de Voorde (Ed.), De Gruyter publications
- 3. Nanoparticles-Biological activities and nanotechnology, Mindy Adams, NY Research Press
- 4. Theory and applications of Nano particals, Andrew Green, NY Research Press

Reference Books:

- 1. Textbook of Nanoscience & Nanotechnology, B.S. Murthy p. Shankar Baldev, University Press-IIM
- 2. Nanotechnology- A future technology with Visions-BPB Publications
- 3. Nanotribology, edited by Stephen M. Nsu, Z. Charles Ying, Springer International Edition
- 4. Introduction to Nanotechnology, Charles P. Poole Jr. Frank J. Owens, Willey Students Editions.

Dr. I. SREEVANI M.Sc., Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA 5:6005

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING

KADAPA - 516 003. (A.P.)

Course Title	C	orrosio	n and C	B. (Open el	Tech. ective)V	Sem		
Course Code	Category	Н	ours/We	ek	Credit s	Maximum Marks		
180E2608	Open Elective	L	Т	P	C	Continuou s Internal Assessment	End Exam s	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2Hrs						End Exam	Duratio	n: 3Hrs

- To review the fundamental aspects of electrochemistry.
- It also focuses on various forms of corrosion, and their impact on life of metallurgical components, means and ways to engineer corrosion

Course	Course Outcomes: On successful completion of this course, the students will be able to						
CO 1							
CO 2							
CO 3	Analyze different factors of environment which influence corrosion in different medium						
CO 4	Identify different control methods for efficient electrodeposition						
CO 5	Discuss corrosion aspects which will enable them to apply for modern technology						

Unit-1: Introduction

Introduction to corrosion, definition and types of Corrosion (Dry & Wet Corrosion) & its mechanisms, Galvanic series, Factors influencing corrosion.

Learning Outcomes:

At the end of the unit, The students will be able to

- Explain the types of corrosion.
- Identify the factors which influence corrosion.

Unit-2: Corrosion& Various phenomenon

Uniform Corrosion (definition, mechanism &prevention), Galvanic (Two-metal) Corrosion (Definition, mechanism & prevention), Pitting corrosion (Definition, mechanism & prevention), Concentration Cell Corrosion (Definition, mechanism & prevention).

Learning Outcomes:

At the end of the unit, The students will be able to

- Explain the mechanisms and prevention methods of different forms of corrosion.
- Analyze the differences between pitting and galvanic corrosion.

Unit-3: Environmental Factors on Corrosion

Various factors that influence Corrosion- Corrosion in water and aqueous solution, microbiologically induced corrosion, corrosion in acidic and alkaline medium.

Learning Outcomes:

At the end of the unit, The students will be able to

• discuss various environmental factors which influence the corrosion

Unit-4: Prevention & Control

Basic principle & concepts of prevention of corrosion-Cathodic protection (Sacrificial anodic protection, Impressed current Cathodic protection), Electroplating & Electroless plating with examples- Alternation of Environment.

Learning Outcomes:

At the end of the unit, The students will be able to

- explain the prevention methods of corrosion
- discuss the basic concepts of electroplating and electroless plating

Unit-5: Modern theory and applications of corrosion:

Introduction, Gibb's free energy, cell potentials, emf series, Corrosion rate expressions, applications in modern technology

Learning Outcomes:

At the end of the unit, The students will be able to

- Analyze the rate of corrosion
- Explain the importance of Electrochemical series

Textbooks:

- Text Book of Engineering Chemistry, Shashi Chawla, Dhanapath Rai Publications, New Delhi, 4th Edition, 2011.
- 2. Corrosion of metals, Helmut Kaesche, Springer Publications
- 3. Handbook of Corrosion Engineering, 3rd edition, Pierre R. Roberg, McGraw Hill publications
- 4. General Chemistry for Engineers, Jeffrey S. Gaffney & Nancy A. Marley, Elsevier publications

REFERENCES:

- 1. Corrosion engineering, Fontana Mars G, Mc Graw Hill publications
- 2. A Text Book of Engineering Chemistry, Jain and Jain, Dhanapath Rai Publishing Company, New Delhi, 15th Edition, 2010
- 3. Corrosion and chemical resistant masonry materials Handbook, Walter T.V. Sheppard Lee, Building materials series.
- 4. General chemistry by Ebbing Darrell, Himalaya Publications

Dr. I. SREEVANI M.Sc., Ph.D. Head of Humanities & Sciences

KSRM College of Engineering KADAPA-516 005 V.S.S.MW/S
PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING KADAPA - 516 003. (A.P.)

Course Title	Fuel Technology					B. Tech. (Open elective) VII Sem		
Course Code	Category	Hours/Week			Credit s	Maxim	ıum Mar	ks
18OE2613	Open Elective	L	T	P	С	Continuou s Internal Assessment	End Exam s	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2Hrs						End Exam	Duratio	n: 3Hrs

- The students will have the general knowledge of Fuels in the context of clean power, sustainability and alternative fuels
- To build up knowledge of concepts and theories of fuel combustion & control process

Course	Course Outcomes: On successful completion of this course, the students will be able to					
CO 1	CO 1 Recall the Characteristics & properties of a fuel.					
CO 2	CO 2 Analyze the concept of solid fuels and evaluate the calorific value of solid fuels					
CO 3	CO 3 Explore the process of Refining of petroleum and uses of various byproducts					
CO 4	CO 4 Identify various types of gaseous fuels that reduces exhaust gas emissions					
CO 5						
	of alternative fuels					

UNIT-I-Introduction

Fuels-Introduction, Classification of Fuels, Characteristics of a Good fuel, Calorific Value of Fuels-Gross calorific value &Net calorific Value-definition, units & their relation.

Learning Outcomes:

At the end of the unit, The students will be able to

- Classification of fuels
- Analyze the characteristics of a good fuel

UNIT-2-Solid Fuels

Introduction, Types of Coal, Coal formation, Properties, Advantage & disadvantages of solid fuels, manufacture of metallurgical Coke, Determination of Calorific value of solid fuel by Bomb calorimeter

Learning Outcomes:

At the end of the unit, The students will be able to

- Explain the advantages and disadvantages of solid fuel
- Determine the calorific value of fuel by Bomb Calorimeter

UNIT-3-Liquid Fuels

Introduction, Properties, Advantages & disadvantages of Liquid fuels, Classification of petroleum, refining of petroleum-Refining of petroleum, uses of various petroleum products, Synthetic Petrol-Synthesis methods-Fischer-Tropsch method and Bergius process.

Learning Outcomes:

At the end of the unit. The students will be able to

- Explain the advantages and disadvantages of Liquid fuel.
- Discuss about refining of petroleum and uses of various petroleum products.

UNIT-4-Gaseous Fuels

Introduction, Properties, Advantages & disadvantages Of Gaseous fuels - Preparation, properties & uses of Natural gas, producer gas, water gas. Determination of calorific value of gaseous fuels by Junker's Gas Calorimeter.

Learning Outcomes:

At the end of the unit, The students will be able to

- Explain the advantages and disadvantages of Gaseous fuel.
- Preparation and properties of different types of gaseous fuels

Unit-5-Need for Alternate Fuels

Need for alternate fuels- Effects of Exhaust gas emissions on environment & Humans (NO, NO_2 , CO_2 , CO, SO_X).

Introduction to alternate fuels- General uses of alternate fuels like Hydrogen, LPG, CNG, Biogas, Biofuels-Types of Biofuels, Applications of Biofuels, Merits & demerits of alternate fuels.

Learning Outcomes:

At the end of the unit, The students will be able to

- Know about the effects of exhaust gas emissions on environment and humans.
- Analyze the merits and demerits of alternate fuels

Textbooks:

- 1. Text Book of Engineering Chemistry, Shashi Chawla, Dhanapath Rai Publications, New Delhi, 4th Edition, 2011.
- 2. Internal Combustion Engine Fundamentals, Heywood John B, Pragnya IAS Publications
- 3. General Chemistry for Engineers, Jeffrey S. Gaffrey & Nancy A. Marky
- 4. Fuels & Fuel- Additives, S.P.Srivastava, Jeno Hancsok, Willey Publications

REFERENCES:

- 1. A Text Book of Engineering Chemistry, Jain and Jain, Dhanapath Rai Publishing Company, New Delhi, 15th Edition, 2010.
- 2. Alternative Liquid fuels, Desai Ashok V, Willey Publications
- 3. Introduction to Combustion, Turns Stephen R, Mc GrawHill Publications
- 4. Fuels and Fuels Technology, Wilfrid Francis, Martin C. Peters, 2nd edition, Elsevier publications

Dr. I. SREEVANI M.Sc., Ph.D. Head of Humanities & Sciences K.S.R.M College of Engineering

KADAPA - 516 005

PRINCIPAL

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING

KADAPA - 516 003. (A.P.)

Course Title	Green	Chemis	stry and	B. (Open Elec	Tech. ctive) VII	I Sem		
Course Code	Category	Н	ours/We	eek	Credit s	Maximum Marks		
180E2618	Open Elective	L	Т	P	C	Continuou s Internal Assessment	End Exam s	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2Hrs						End Exam	Duratio	n: 3Hrs

- To make students aware of how chemical processes can be designed, developed and run in a sustainable way.
- o Students acquire the competence to think of chemistry as a sustainable activity

Course	Course Outcomes: On successful completion of this course, the students will be able to						
CO 1	Understand the Principles of Green Chemistry						
CO 2	Knowledge of applications of green routes for synthesis of chemicals						
CO 3	Synthesis of biocatalysts using different techniques						
CO 4	Analyze about trends of solvent free chemical reactions						
CO 5	Better realization about reflections of Green Chemistry on sustainable development						
	initiatives.						

Unit-1: Fundamentals of Green Chemistry:

Discussion of the current state of chemistry and the environment and the definition of green chemistry. An introduction to the tools of green chemistry and its fundamental principles.

Learning Outcomes:

After completing this unit, the student will be able to

- Summarize the principles in green chemistry.
- Understand the importance of green chemistry in future development

Unit-2: Principles of Green Chemistry:

Prevention of waste / by-products, Hazardous products Designing of safer chemicals-Selection of appropriate solvents and starting materials- Use of protecting groups and catalysis- Designing of biodegradable products.

Learning Outcomes:

After completing this unit, the student will be able to

- Explain the importance of designing of safer chemicals.
- Interpret the need for selection of appropriate solvents and starting materials in chemical reactions.

UNIT-3: Catalysis for Green Chemistry:

Use of biocatalysts- Biochemical Oxidation, Biochemical Reduction, Modified biocatalysts-transition metal catalysis-Simmons-Smith reaction, Heak reaction, Ullmann's coupling.

Learning Outcomes:

After completing this unit, the student will be able to

- Know the use of biocatalysts.
- Explain transition metal catalysis reactions

UNIT-4: Solvent Free Reactions:

Solvent free techniques- Reactions on solid mineral supports, Phase Transfer Catalysis- Catalysis- Catalysis- N-alkylation.

Learning Outcomes:

After completing this unit, the student will be able to

• Explain solvent free reactions in green synthesis

UNIT-5: Ultrasound assisted green synthesis:

Introduction to ultrasound assisted green synthesis, Oxidation, Reduction, Hydroboration, Bouveault reaction.

Learning Outcomes:

After completing this unit, the student will be able to

Understand the importance of ultrasound assisted Green synthesis

Textbooks:

- 1. Engineering Chemistry, Fundamentals and Applications, Shikha Agarwal
- 2. Green Chemistry: Theory & Practice, Oxford University Press, Oxford publication, 1998
- 3. Green chemistry, Stanley E. Manahan, ChemChar Research, Inc publishers 2005.
- 4. Introduction to Green Chemistry, Second edition, Albert Matlack, CRC Press 2016

References:

- 1. Text Book of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co Publishers, New Delhi, 2006.
- 2. Handbook of Green chemistry and technology, James H. Clark, Duncan J. MacQuarrie, Blackwell, Abingdon,2002
- 3. An Introduction Text on Green Chemistry, Indu Tucker Sidhwani, Rakesh K. Sharma, Wiley Publications
- 4. Green Organic Chemistry in Lecture and laboratory, Andrew P. Dicks & Michael C. Cann, T& F India publications.

Dr. I. SACTOVANI M.Sc., Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA 516,005

PRINCIPAL
K.S.R.M. COLLEGE OF ENGINEERING
KADAPA - 516 003. (A.P.)

K.S.R.M College of Engineering (Autonomous), Kadapa **Engineering Chemistry Bridge Course**

Module 1 on Coordination Chemistry

4 lectures

Importance of coordination chemistry, Types of complexes, Classification of Ligands. Crystal Field Theory to explain nature of bonding in octahedral complexes.

Crystal Field Theory to explain nature of bonding in tetrahedral, octahedral and square planar complexes. Magnetic properties of all types of complexes. Color of complexes,

Module 2 on Organic Chemistry

4 lectures

Introduction to Reaction Intermediates:

Carbocations, Free Radicals, Carbenes, nitrenes & Ylides: Generation, stability, applications in synthetic organic chemistry. E 1 & E 2, SN1 & SN2 reactions introduction.

Module 3- Thermodynamics

3 lectures

Thermodynamics and Equilibrium-Introduction, Entropy, Enthalpy, Gibbs Free Energy, Ideal gas equation.

Module 4- Electrochemistry

Basics of Electrochemistry - Cell Introduction-Oxidation, Reduction, Redox reaction, 2 lectures Cell Notations, Electrochemical cells-Introduction.

Module 5- Chemical Kinetics

Chemical Kinetics- order of Reactions, Rate of reactions, factors effecting rate of 2 lectures reactions

Dr. I. SKEEVANI M.Sc., Ph.D.

Head of Humanities & Sciences K.S.R.M College of Engineering

KADAPA - 516 005

PRINCIPAL

V. S. S. Muly

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING KADAPA - 516 003. (A.P.)

Non-Conventional Energy Sources

Certification Course

(30 Hrs)

Course Objective:

- To understand the need of energy resources due to degradation of convention sources
- Familiarize the use of non-conventional resources
- To establish sustainable growth

Course Outcomes:

- 1. Understand the need of energy sources and advantages of renewable energy resources over conventional resources
- 2. Estimate the solar energy utilization and Principles involved in solar energy collection and conversion of it to electricity generation
- 3. Explore the concepts involved in Wind energy conversion
- 4. Explain the operational methods of utilization of Tidal energy
- 5. Demonstrate the biogas production and its applications

Module-1- Introduction to Energy resources

Introduction, Differences between Renewable and Non-renewable Energy resources, Advantages and Disadvantages of Renewable Energy resources over Conventional Energy Resources, Need for alternate source of Energy, Types of Renewable Energy resources

Module-2-Solar Energy

Advantages and Limitations of Solar energy, Solar Radiation, Measurement of Solar Radiation, Solar Conversion, Solar Collectors, Photovoltaic cells, Solar Energy Storage, Solar Energy Applications

Module-3-Wind Energy

Introduction, Wind Mills-Basic components in wind mills, Classification, Horizontal Axis wind mills, Vertical Axis wind mills, Advantages and Limitations of Wind energy

Module-4-Tidal Energy

Introduction, Tidal power generation, Components of Tidal power plant, Operating methods of utilization of tidal energy, Advantages and Disadvantages of Tidal power

Dr. I. SREEVANI M.Sc., Ph.D.
Head of stom in a s & Sciences
K.S.R.M. College of Engineering
K.A.D.A.P.A. - 516 005

Module-5-Bio Energy

Introduction, Biogas generation, Different sources of biomass production Biomass conversion, materials used for Biogas generation, Advantages and disadvantages of Bio energy

Textbooks:

- **1.** Fundamentals of non-Conventional Energy Sources, Inamdar KH Dr, Electrotech Publications
- 2. Renewable Energy Sources and their Environmental Impact, Abbasi S Anaseenaa, Dhanapat Rai publications

Reference books:

- 1. Non-Conventional Energy Sources, Rai G.D, Cambridge, Printed Books publications
- 2. Hand book of Energy Conservations Vol-1, Basics Concepts of energy, Robert H M Collins, Cengage
- 3. Renewable Energy Sources & Engineering Technologies, Kothari D P, Singal K.C, Ranjan Rakesh, PHI Publications

Dr. I. SREEVANI M.Sc., Ph.D. Head of Hum in ties & Sciences

KSR Al vollege of Engineering

KADAPA 516 005

CERTIFICATE COURSE ON SUSTAINABLE ENGINEERING

Course Objectives:

- To have increased awareness among engineering students on sustainability
- To know the environment & key lifestyles and their influencing factors
- To understand the various types of environmental pollutions and their sustainable solutions
- To have a better perception of life cycle assessment and environmental risk assessment.
- To develop sustainable practices by utilizing the engineering knowledge and principles
- To become critical and proactive thinkers and, with this, successful engineers in the field

UNIT-I: Sustainability: Introduction – Concepts – Need to promote sustainability – Three pillars of sustainability – Nexus between technology and sustainable development – Challenges for sustainable development -Benefits of sustainable living.

UNIT-II: The Environment and Key Life Styles: Food – Housing – Mobility – Consumer goods – Leisure time. Factors influencing consumption and lifestyles – Determinants – Driving factors – Motivating factors.

UNIT-III: Natural Resources and their Pollution: Air pollution – effects of air pollution – Clean development mechanism – Water pollution – Sustainable waste water treatment – Solid waste – sources – Impacts of solid waste – Zero waste concepts – 3R concept – Global environmental issues – Resource degradation - Climate change – Global warming - Ozone layer depletion. Carbon credits and carbon trading – Carbon foot prints.

UNIT-IV: Life Cycle Assessment (LCA): Introduction – LCA & Sustainability – LCA and Environmental system – LCA and Water, Food & Energy – Environmental risk assessment – Environmental data collection and LCA methods – ISO 14040 – Key points of good LCA with examples.

UNIT-V: Design for Sustainability: Green engineering – Sustainable engineering principles – Green sustainable materials - Sustainable urbanization – Industrial ecology – Industrial symbiosis – Case Studies.

Reference Books:

- Alleng, D.T. and Shonnard, D.R., Sustainability Engineering: Concepts, Design and Case studies, Prentice Hall
- Bradley. A.S., Adebayo, A.O., Maria, P. Engineering Applications in Sustainable Design and Development, Cengage learning.
- Ni Bin Chang, Systems Analysis for Sustainable Engineering: Theory and Applications, Tata McGraw-Hill Publications.
- Purohit, S.S., *Green Technology: An Approach for Sustainable Environment*, Agrobios Publications.

My

Dr. I. SREEVANI M.Sc., Ph.D. Head of Hum in ties & Sciences

K.S.R.M. College of Engineering KADAPA - 516 005

About this call

People

Informati...



suresh reddy



IN CALL

Prashanthi Badvel (You)

Dr K Venkata Ra...

HODH&S ...

HODH&S & :

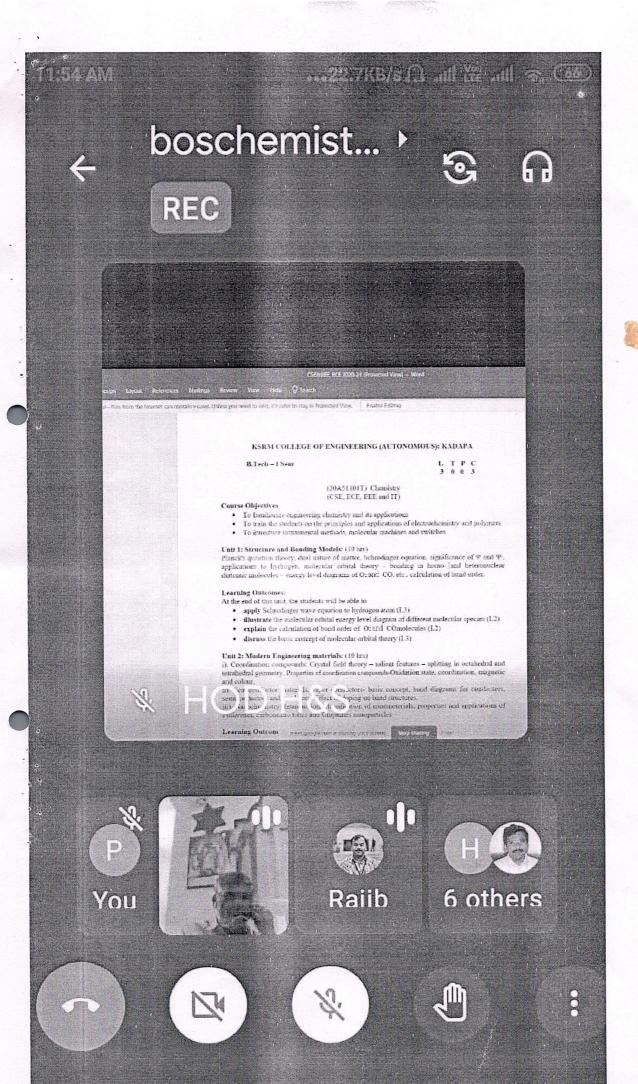
Mary Jasmine 🐰 :

Prof. G.V. Subba ...

Rajib Biswas :

Sudha Vonteru 🔆 :

suresh reddy • • • :





...50.4KB/s 🗘 📶 🎇 🐠



boschemist....

REC



KSRM COLLEGE OF ENGINEERING (AUTONOMOUS): KADAPA

B. Tech - I Sem

(20A51101T) Chemistry (CSE, ECE, EEE and IT)

Course Objectives:

- To familiarize engineering chemistry and its applications
 To train the students on the principles and applications of electrochemistry and polymers
 To introduce insummental methods, molecular machines and switches

Unit 1: Structure and Bonding Models: (10 hrs)

Plane's quantum theory, dual nature of matter, Schrodinger equation, significance of W and W, applications to hydrogen, molecular orbital theory – bonding in homo-land beteromorlear distormic molecules – energy level diagrams of Orbita's CO, etc., calculation of bond order.

Learning Outcomes: At the end of this unit, the students will be able to

- apply Schrodiager wave equation to hydrogen atom (L3)
 illustrate the molecular orbital energy level diagram of different molecular species (L2)
 explain the redudation of bond order of Overal Comolecules (L2)
- discuss the basic concept of molecular orbital theory (£3)

Unit 2: Modern Engineering materials: (10 km)

Coordination compounds: Crystal field theory—salient features—splitting is octahedral and tetrahedral geometry. Properties of coordination compounds-Oxidation state, coordination, magnetic and colour.

and constant.

on "on constitute inter is, m_e er t and t to be concept, band diagrams for conductors, nearly factor and the one of the t to be some and the one of the first one of the other constant and applications of reference, and one of the first one of the other constant o

Learning Outcom









Railb

6 others











modified chemistry lab syllabus (CSE, ECE& EEE)-reg

3 messages

HOD H&S <hod.hs@ksrmce.ac.in>

Sat, Jan 16, 2021 at 11:36 AM

To: "Prof. G.V. Subba Reddy" <gopireddy.chemistry@jntua.ac.in>, viceprincipal.cep@jntua.ac.in

Respected Sir,

As per your suggestions, we have modified the chemistry lab experiments (CSE, ECE & EEE) branch. please find the attachment.

. Thank you Sir Dr. I. Sreevani



CSE&EEE, ECE 2020-21.docx 21K

viceprincipal cep <viceprincipal.cep@jntua.ac.in> To: HOD H&S < hod.hs@ksrmce.ac.in>

Sun, Jan 17, 2021 at 4:45 PM

Srivani, It is okay. It is accepted and approved.



Virus-free. www.avast.com

[Quoted text hidden]

with best regards Prof.G.V.SUBBA REDDY, M.Sc., B.Ed., Ph.D, PGDCS, MISTE Head of Chemistry & Vice Principal JNTUA College of Engineering Pulivendula - 516 390 YSR (Dist), A.P, India 9000551428 (O), 9441980604(P)

.HOD H&S <hod.hs@ksrmce.ac.in> To: viceprincipal cep <viceprincipal.cep@jntua.ac.in>

Thanks a lot. Sir

Dr I Sreevani [Quoted text hidden] Mon, Jan 18, 2021 at 10:44 AM

Green Chemistry and Technology-open elective.docx

12K

Rajib Biswas <rajib@iittp.ac.in>

Mon, Jan 11, 2021 at 2:05 PM

To: HOD H&S <hod.hs@ksrmce.ac.in>

Cc: csrsvu@gmail.com, "Prof. G.V. Subba Reddy" <gopireddy.chemistry@jntua.ac.in>, ibchyd@gmail.com

Dear Madam,

Thanks for your email. This looks fine to me.

Thanks for involving me in this process. Looking forward to seeing the college in person someday.

With regards,

Rajib Biswas

Assistant Professor

Department of Chemistry

Indian Institute of Technology Tirupati

Tirupati - 517506,

Ph. No. (O): 08772503107

Web: http://iittp.ac.in/dr-rajib-biswas

Group Homepage: https://sites.google.com/view/rajibbiswas/

[Quoted text hidden]

HOD H&S <hod.hs@ksrmce.ac.in>

Mon, Jan 11, 2021 at 2:43 PM

To: Rajib Biswas <rajib@iittp.ac.in>

Cc: csrsvu@gmail.com, "Prof. G.V. Subba Reddy" <gopireddy.chemistry@jntua.ac.in>, ibchyd@gmail.com

Thank you for your response, please send your bank account no and IFSC code, sir

Dr I Sreevani

KSRM COLLEGE OF ENGINEERING

Kadapa

[Quoted text hidden]

suresh reddy <csrsvu@gmail.com> To: HOD H&S <hod.hs@ksrmce.ac.in> Mon, Jan 11, 2021 at 2:52 PM

Dear Dr. Sreevani

'Greetings of the day

Thank you for your mail. I have gone through the Syllabus. It's fine and OK for me.

Prof C.Suresh Reddy

Prof. C. Suresh Reddy, FAPAS, MNASc

-Department of Chemistry

S.V.U. College of Sciences

Sri Venkateswara University

Tirupati-517 502, A.P., India

Mobile: 98496 94958

[Quoted text hidden]

suresh reddy <csrsvu@gmail.com> To: HOD H&S <hod.hs@ksrmce.ac.in> Mon, Jan 11, 2021 at 2:56 PM

Dear Dr .Sreevani

Thank you for your mail. I have gone through the Syllabus. It's fine and approved.

With regards

Prof. C.Suresh Reddy

[Quoted text hidden]

[Quoted text hidden]