BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Department of Electronics and Instrumentation Engineering

COURSE STRUCTURE

AND

SYLLABUS FOR 1ST YEAR B.TECH.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
First Year B. Tech (SEMESTER – I)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18MA001	Linear Algebra and Ordinary Differential Equations	3	1	0	4	50	50	100	3
2	18PH001	waves and optics (Physics - 1)	4	1	0	5	50	50	100	4
3	18CY001	Engineering Chemistry	4	0	0	4	50	50	100	3
4	18EL001	Communicative English	3	0	0	3	50	50	100	2
5	18MEL01	Engineering Graphics	2	0	4	6	50	50	100	3
6	18PHL01	Physics Lab	0	0	3	3	50	50	100	1
7	18ELL01	English communications and Skills laboratory	0	0	3	3	50	50	100	1
8	18MEL01	Workshop	0	0	3	3	50	50	100	1
		TOTAL	16	2	13	31	400	400	800	18

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective from the Academic Year2018-2019(R18 Regulations)
First Year B. Tech(SEMESTER – II)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18MA002	Numerical Methods and Advanced Calculus	4	0	0	4	50	50	100	3
2	18PH003	Semiconductor Physics and Nano Materials	4	0	0	4	50	50	100	3
3	18EI203	Instrumentation & Nanotechnology	4	0	0	4	50	50	100	3
4	18EE002	Basic Electrical Engineering	4	0	0	4	50	50	100	3
5	18CE001	Environmental Studies	3	0	0	3	50	50	100	2
6	18CS001	Programming for Problem Solving	4	0	0	4	50	50	100	3
7	18CYL01	Chemistry Lab	0	0	3	3	50	50	100	1
8	18EEL01	Basic Electrical Engineering Lab	0	0	3	3	50	50	100	1
9	18CSL01	Programming Lab	0	0	3	3	50	50	100	1
		TOTAL	23	0	9	32	450	450	900	20

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
Second Year B. Tech(SEMESTER – III)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18MA003	Probability and Statistics	3	1	0	4	50	50	100	3
2	18EI302	Electronic Devices Circuits	3	1	0	4	50	50	100	3
3	18EI303	Digital Electronics	3	1	0	4	50	50	100	3
4	18EI304	Network Theory	3	1	0	4	50	50	100	3
5	18ME001	Elements of Mechanical Engineering	4	0	0	4	50	50	100	3
6	18EI306	Professional Ethics and Human Values	3	0	0	3	50	50	100	2
7	18EIL31	Electronic Devices Lab	0	0	3	3	50	50	100	1
8	18EIL32	Digital Electronics Lab	0	0	3	3	50	50	100	1
9	18EIL 33	Simulation Lab (Net Works)	0	0	3	3	50	50	100	1
		TOTAL	**19**	**4**	**9**	**32**	**450**	**450**	**900**	**20**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
Second Year B. Tech(SEMESTER – IV)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18MA004	Complex Analysis and Special functions	3	1	0	4	50	50	100	3
2	18EI402	Electrical & Electronic Measurements	4	1	0	4	50	50	100	4
3	18EI403	Signals & Systems	4	1	0	4	50	50	100	4
4	18EI404	Analog Electronic Circuits–1	4	1	0	4	50	50	100	4
5	18EL002	Technical English	3	0	0	3	50	50	100	2
6	18CE002	Biology for Engineers	3	0	0	4	50	50	100	2
7	18EIL41	Measurements Lab	0	0	3	3	50	50	100	1
8	18EIL42	Signals and Systems Lab	0	0	3	3	50	50	100	1
9	18EIL43	Analog Electronic Circuits Lab	0	0	3	3	50	50	100	1
		TOTAL	**21**	**4**	**9**	**34**	**450**	**450**	**900**	**22**

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical

MOOCS COURSE CREDITS - 2

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
Third Year B. Tech(SEMESTER – V)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18EI501	Control Systems	4	1	0	5	50	50	100	4
2	18EI502	Transducers	3	1	0	4	50	50	100	3
3	18EI503	**Analog Electronic Circuits – II**	3	1	0	4	50	50	100	3
4	18EI504	Microcontrollers	3	1	0	4	50	50	100	3
5	18EID11…4	Program Elective - 1	3	1	0	4	50	50	100	3
6	18EI506	Analog and Digital Communications	3	1	0	4	50	50	100	3
7	18EIL51	Simulation Lab (Control Systems)	0	0	3	3	50	50	100	1
8	18EIL52	Transducers Lab	0	0	3	3	50	50	100	1
9	18EIL53	Micro Controllers Lab	0	0	3	3	50	50	100	1
10		MOOCS								2
		TOTAL	19	6	9	34	450	450	900	24

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical

Program Elective - I
1) Pulse switching Circuits
2) Noise and interference in instrumentation
3) Intelligent sensors and instrumentation
4) Telemetry and SCADA

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
Third Year B. Tech(SEMESTER – VI)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18EI601	Industrial Instrumentation	3	1	0	4	50	50	100	3
2	18EI602	Process Control	4	1	0	4	50	50	100	4
3	18EI603	Digital Signal Processing	3	1	0	4	50	50	100	3
4	18EID21…4	Program Elective - 2	3	1	0	4	50	50	100	3
5	18EI605	OOPS With JAVA	3	1	0	4	50	50	100	3
6	18EI606	Constitution of India	3	0	0	3	50	50	100	0
7	18EIL61	Process Control Lab	0	0	3	3	50	50	100	1
8	18EIL62	Digital Signal Processing Lab	0	0	3	3	50	50	100	1
9	18ELL02	Technical English Lab	0	0	3	3	50	50	100	1
		TOTAL	19	5	9	33	450	450	900	19

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical

Program Elective – 2
1) Digital Control Systems
2) Advanced Digital System Design
3) Robotics and Automation
4) Measurement errors and Statistical Analysis

SUMMMER INTURNSHIP – CREDITS - 2

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
Fourth Year B. Tech(SEMESTER – VII)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18ME002	Industrial Management and Entrepreneurship developmentManagement-1	4	0	0	4	50	50	100	3
2	18EI702	Biomedical Instrumentation	4	0	0	4	50	50	100	3
3	18EI703	Analytical Instrumentation	4	0	0	4	50	50	100	3
4	18EID31…4	Program Elective -3	3	1	0	4	50	50	100	3
5	18EID41…4	Program Elective – 4	3	1	0	4	50	50	100	3
6	18…I11..2	Institutional Elective-– 1	3	1	0	4	50	50	100	3
7	18EIL71	Project - 1	0	0	5	5	50	50	100	2
8	18EIL72	BMI Lab	0	0	1	3	50	50	100	1
9	18EIL73	AI Lab	0	0	1	3	50	50	100	1
10		INTEURN SHIP					100	-	100	2
		TOTAL	21	3	7	35	550	450	1000	24

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical

Program Elective – 3
1) Optoelectronics and laser Instrumentation
2) Embedded Systems
3) Optimization Techniques.
4) Non Linear and Robust Control

Program Elective -4
1) Data Communications
2) Bio signal processing
3) Microprocessor based medical instruments
4) Wireless Sensor Networks.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Electronics and InstrumentationEngineering
Effective From the Academic Year2018-2019(R18 Regulations)
Forth Year B. Tech(SEMESTER – VII)

S.No	Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
			L	T	P	Total	CIE	SEE	Total Marks	
1	18EID5 1…4	Program Elective-5	3	1	0	4	50	50	100	3
2	18EID6 1…4	Program Elective-6	3	1	0	4	50	50	100	3
3	18..I2 1..2	Institutional Elective-– II	3	1	0	3	50	50	100	3
4	18EIP81	Project-II	0	0	20	20	75	75	150	10
		TOTAL	9	3	20	31	225	225	450	19

CIE: Continuous Internal Evaluation SEE: Semester End Examination
L: Lecture T: Tutorial P: Practical

Program Elective - 5
1) virtual instrumentation
2) Instrumentation for Aerospace and Navigation
3) Medical Imaging
4) Programmable Logic Controllers

Program Elective - 6
1) Digital Image Processing
2) Graph Theory and applications
3) Advanced Sensors
4) Adaptive Control Systems

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institutional Elective-I

S.No.	Code	Course Title
1	**18CEI01**	Air Pollution & Control
2	**18CEI02**	Sustainable Water and Sanitation
3	**18CSI01**	Java Programming
4	**18CSI02**	Database Management Systems
5	**18ECI01**	Consumer Electronics
6	**18ECI02**	Embedded Systems
`7	**18EEI01**	Application of Wavelets to Engineering Problems
8	**18EEI02**	Industrial Electrical Systems
9	**18ITI01**	Data Analytics
10	**18ITI02**	Cyber Security
11	**18MEI01**	Fluid Power and Control Systems
12	**18MEI02**	Project Management
13	**18MAI01**	Linear Algebra
14	**18PHI01**	Nano-Materials and Technology
15	**18PHI02**	Fiber Optic Communication
16	**18HUI01**	System Thinking
17	**18ELI01**	English for Competitive Examinations
18	**18ELI02**	Professional Communication

Institutional Elective-II

S.No.	Code	Course Title
1	**18CEI03**	Disaster Management
2	**18CEI04**	Remote sensing & GIS
3	**18CSI03**	Python Programming
4	**18CSI04**	Computer Networks
5	**18ECI03**	Artificial Neural Network
6	**18ECI04**	Internet of things(IoT)
`7	**18EEI03**	High Voltage Engineering
8	**18EEI04**	Energy Auditing and Conservation
9	**18ITI03**	Mobile Application Developments
10	**18ITI04**	Web Technology
11	**18MEI03**	Non-Conventional Energy Sources
12	**18MEI04**	Automobile Engineering
13	**18MAI02**	Graph Theory
14	**18PHI03**	Advanced Materials
15	**18PHI04**	Optical Electronics
16	**18HUI02**	Organizational Psychology
17	**18HUI03**	Telugu Modern Literature
18	**18ELI03**	English Through Media

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Linear Algebra and ODE
I B.Tech –I Semester (Code: 18MA001)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives:

CO1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

CO2: Identify the type of a given differential equation and select and apply the appropriate analyticaltechnique for finding the solution of first order and higher order ordinary differential equations.

CO3: Create and analyze mathematical models using first and second order differential equations
to solve application problems that arises in engineering.

CO4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

Course Outcomes: Students will be able to

CLO-1:Apply elementary row operations to find the rank of a matrix, to solve a system of linear equations and to find the inverse of a matrix.

CLO-2:Find the Eigen values and Eigen vectors of the given square matrix and also compute the higher
powers of the given matrix.

CLO-3: Solve separable, linear, exact differential equations with and without initial conditions.

CLO-4:Distinguish between linear and non-linear differential equation.

CLO-5: Write the piecewise continuous functions in terms of unit step functions and hence find its Laplace transforms.

CLO-6:Solve linear differential equation with constant coefficients and unit step input functions using
Laplace transforms technique.

SYLLABUS

UNIT - I

Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan method of finding the inverse; Consistency of linear System of equations: Rouches theorem, System of linear Non-homogeneous equations, System of linear homogeneous equations; vectors; Eigen values; properties of Eigen values(without proofs); Cayley-Hamilton theorem (without proof).

[Sections: 2.7.1; 2.7.2; 2.7.6; 2.10.1; 2.10.2; 2.10.3; 2.12.1; 2.13.1; 2.14; 2.15.]

[12 Hours]

UNIT - II

Differential Equations of first order: Definitions; Formation of a Differential equation; Solution of a Differential equation; Equations of the first order and first degree; variables separable; Linear Equations; Bernoulli's equation; Exact Differential equations; Equations reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the equation M dx+ N dy=0.

Applications of a first order Differential equations: Newton's law of cooling; Rate of decay of Radio-active materials.

[Sections: 11.1; 11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4; 12.6; 12.8] [12 Hours]

UNIT – III

Linear Differential Equations: Definitions; Theorem; Operator D; Rules for finding the complementary function; Inverse operator; Rules for finding the Particular Integral; Working procedure to solve the equation; Method of Variation of Parameters; Applications of Linear Differential Equations: Oscillatory Electrical Circuits.

[Sections: 13.1; 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5]

[12 Hours]

UNIT – IV

Laplace Transforms: Definition; conditions for the existence; Transforms of elementary functions; properties of Laplace Transforms; Transforms of derivatives; Transforms of integrals; Multiplication by t^n; Division by t; Inverse transforms- Method of partial fractions; Other methods of finding inverse transforms; Convolution theorem(without proof); Application to differential equations: Solution of ODE with constant coefficients using Laplace transforms.

[Sections:21.2.1; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.15.1]

[12 Hours]

TEXT BOOK:

B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCE BOOKS:

[1] ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

WAVES AND MODERN PHYSICS

(ENGINEERING PHYSICS-1)

I B.TECH – I SEMESTER (CODE-18PH001)

(Common for ECE,EEE,EIE)

Lectures	**4**	Tutorial	**0**	Practical	**0**	Credits	**3**
Continuous Internal Assessment			**50**	Semester End Examination (3hours)			**50**

COURSE OBJECTIVES

CO1: To familiarize the students in getting knowledge about modern optics and their Engineering applications.
CO2: To make aware of the students to obtain circuit knowledge regarding electrical, Electronics and Magnetism.
CO 3: To make the students to understand the quantum theory and solving the various Physical problems using quantum mechanics.
CO 4: To get the knowledge of various methods of analytical techniques for material testing.

COURSE OUTCOMES: Student will be able to

CLO1: Learn about principle and working of different types of lasers and their applications.
CLO2: Know about principle, types of optical fibres of their importance in communication.
CLO3: Analyse the electromagnetic principles in electrical and electronic circuits and Maxwell's equations.
CLO4: Study about quantum mechanics and its applications.
CLO5: Read about properties and applications of ultrasonics in various fields.
CLO6:Know about radio isotopes and their applications.

UNIT-I (ADVANCED OPTICS)

Lasers: Interaction of radiation with matter. Einstein co-efficients, Properties of laser,Population inversion, LASER principle, pumping schemes-Three level and four level laser, ypes of lasers: solid-state lasers (Ruby), gas lasers (He-Ne), Semiconductor lasers; applications of lasers in industry and medicine.

Fibre Optics: Importance of optical fibre, Structure and principle of optical fibre, acceptance angle and numerical aperture, Types of optical fibres based on modes and refractive index, V-number, losses associated with optical fibres, ,fibre optical communication, advantages of optical fibres

UNIT-II (ELECTRO-MAGNETIC INDUCTION AND MAXWELL'S EQUATIONS)

Maxwell's equations in vacuum and conducting medium.Velocity of electromagnetic wave in vacuum. Electromagnetic oscillations in LC circuit, LCR series resonance in A.C circuit and resonant frequency, Quality factor. Concept of skin effect, Energy in an electromagnetic field; Flow of energy and Poynting vector.Principle of circulating charge and cyclotron, Hall Effect.

UNIT-III (**MODERN PHYSICS)**

Dual nature of light, Debroglie concept of matter waves, Davission-Germer experiment, Heisenberg uncertainty principle and applications (non existence of electron in nucleus and finite width of spectral lines), one dimensional time independent and dependent Schrodinger wave equation, physical significance of wave function, application of Schrödinger wave equation to particle in a one dimensional potential box, concept of quantum tunnelling and construction and working of Scanning Tunnelling Electron Microscope.

UNIT-IV (ANALYTICAL TECHNIQUES)

Ultrosonics: Properties of ultrasonics, Production of ultrasonic waves by magnetostriction andpiezo-electric method, Determination of velocity of ultrasonic wave in liquids by Ultrasonic interferometer. Medical applications, Ultrasonic Imaging technique(Doppler Ultrasound Imaging advantages and limitations), industrial applications, NDT : Pulse echo technique, Time of flight diffraction technique.

Nuclear Techniques: Radio isotopes and its applications (medical and Industrial), GM counter, Scintillation counter.

****

Books: 1. Engineering physics M.V.Avadhanulu, P.G.KshirsagarS.Chand& Company Pvt. Ltd.

2. Engineering physics, PalaniSwamy,Scitech publication

Reference books: 1. Basic engineering physics – Dr.P.srinivasaRao, Dr.K.Muralidhar, HimalayaPublication

2. Applied physics - Dr.P.SrinivasaRao, Dr.K.Muralidhar, Himalaya publication

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

ENGINEERING CHEMISTRY-1
(Common to all branches)

I B.Tech – I/II Semester (Code: 18CY001)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)			:	50

PREREQUISITES:None

COURSE OBJECTIVES: The student should be conversant:

CO1: With the principles of water characterization and treatment of water for industrial purposes and methods of producing water for potable purposes.
CO2: To understand the thermodynamic concepts, energy changes, concept of corrosion & its control.
CO3: With the conventional energy sources, solid, liquid and gaseous Fuels & knowledge of knocking and anti-knocking characteristics.
CO4: With aim to gain good knowledge of organic reactions, plastics, conducting polymers & biodegradable polymers.

COURSE OUTCOME:

After studying this course, students will be able to:

CLO-1: Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
CLO-2: Apply their knowledge in converting various energies of different systems and protection of different metals from corrosion.
CLO-3: Have the capacity of applying energy sources efficiently and economically for various needs.
CLO-4: Design economically and new methods of organic synthesis andsubstitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.

UNIT I: Water Chemistry **15 hrs**

Introduction: water quality parameters
Characteristics: Alkalinity, Hardness - Estimation & simple neumerical problems,
Boiler Troubles - Sludges, Scales, Caustic embrittlement, boiler corrosion, Priming and foaming;
Internal conditioning- phosphate, calgon and carbonate methods.
External conditioning - Ion exchange process & Zeolite proess
WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration. Disinfection methods: Chlorination, ozonization and UV treatment.
Salinity – Treatment of Brackish water by Reverse Osmosis and Electrodialysis.

UNIT II **15 hrs**

Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies.Free energy and emf.Cell potentials, the Nernst equation and applications.

Corrosion: Types of corrosion - Chemical or dry corrosion, Electrochemical or wet corrosion; Galvanic, stress, pitting and differential aeration corrosion; Factors effecting corrosion, **Corrosion control** – Cathodic protection, and electro plating (Au)&electoless Ni plating.

UNIT III: Fuels **15 hrs**

Classification of fuels; Calorific value of fuels (lower, higher)
Solid fuels: Determination of calorific value (Bomb Calorimeter) & related problems, Coal ranking,
Liquid Fuels: Petroleum refining and fractions, composition and uses. Knocking and anti-knocking Agents, Octane number and Cetane number; Bio fuels- Biodiesel, general methods of preparation and advantages
Gaseous fuels: CNG and LPG,
Flue gas analysis – Orsat apparatus.

UNIT IV: **15 hrs**

Organic reactions and synthesis of a drug molecule
Introduction to reactions involving substitution (SN^1, SN^2), addition (Markownikoff's and anti-Markwnikoff's rules) , elimination (E_1& E_2), Synthesis of a commonly used drug molecule.(Aspirin and Paracetamol)
Polymers: Conducting polymers: Classification, Intrinsic and Extrinsic conducting polymers and their applications**.** Plastics: Thermoplasts and thermosetting plastics, Bskelite and PVC.
Bio degradable polymers: types, examples-Polyhydroxybuterate (PHB), Polyhydroxybuterate-co-β-hydroxyvalerate (PHBV), applications.

TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 17th edition (2017).
2. SeshiChawla, "Engineering Chemistry"DhanpatRai Pub, Co LTD, New Delhi 13 th edition, 2013.

REFERENCES:

1 Essential Of Physical Chemistry by ArunBahl, B.S. Bahl, G.D.Tuli, by ArunBahl, B.S. Bahl, G.D.Tuli, Published by S Chand Publishers, 12th Edition, 2012.

2 Text Book of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).

3 Engineering Chemistry by K. Maheswaramma, Pearson publishers 2015.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Communicative English
18EL001

Lectures:3 Periods/Week | Continuous Assessment: 50M
Sem End Exam Duration: 3 hours | Sem End Exam : 50M

Credits: 2

UNIT-I

1.1 **Vocabulary Development**: Word formation-Formation of Nouns, Verbs & Adjectives from Root words-Suffixes and Prefixes
1.2 **Essential Grammar:** Prepositions, Conjunctions, Articles
1.3 **Basic Writing Skills**: Punctuation in writing
1.4 **Writing Practices**: Mind Mapping, Paragraph writing (structure-Descriptive, Narrative, Expository & Persuasive)

UNIT-II

2.1 **Vocabulary Development**: Synonyms and Antonyms
2.2 **Essential Grammar**: Concord, Modal Verbs, Common Errors
2.3 **Basic Writing Skills**: Using Phrases and clauses
2.4 **Writing Practices**: Hint Development, Essay Writing

Unit III

3.1 **Vocabulary Development**: One word Substitutes
3.2 **Essential Grammar**: Tenses, Voices
3.3 **Basic Writing Skills**: Sentence structures (Simple, Complex, Compound)
3.4 **Writing Practices**: Note Making

Unit IV

4.1 **Vocabulary Development**: Words often confused
4.2 **Essential Grammar**: Reported speech, Common Errors
4.3 **Basic Writing Skills**: Coherence in Writing: Jumbled Sentences
4.4 **Writing Practices**: Paraphrasing &Summarising

Reference Books

- Communication Skills, Sanjay Kumar &PushpaLatha. Oxford University Press:2011.
- Practical English Usage, Michael Swan. Oxford University Press:1995.
- Remedial English Grammar, F.T.Wood. Macmillan:2007.
- Study Writing, Liz Hamplyons& Ben Heasley. Cambridge University Press:2006

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Engineering Graphics

I B.Tech – I Semester (Code: 18MEL01)

Lectures	1	Tutorial	0	Practical	4	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives: To learn

CO1: clear picture about the importance of engineering graphics in the field of engineering

CO2: the drawing skills and impart students to follow Bureau of Indian Standards

CO3: To give an idea about Geometric constructions, Engineering curves, orthographic projections and pictorial projections

CO4: imagination skills about orientation of points, lines, surfaces and solids

CO5: basic drafting skills of AutoCAD

Course Outcomes: Students will be able to

CLO-1: draw projections of points and projections of lines using Auto CAD

CLO-2: plot projections of surfaces like circle, square and rhombus

CLO-3: plot the Projections of solids like Prisms and pyramids

CLO-4: convert the of Orthographic views into isometric views of simple objects

CLO-5: generate the of pictorial views into orthographic views of simple castings

UNIT – I

INTRODUCTION: Introduction to Drawing instruments and their uses, geometrical construction procedures

INTRODUCTION TO AUTOCAD:

Basics of sheet selection, Draw tools, Modify tools, dimensioning

METHOD OF PROJECTIONS: Principles of projection - First angle and third angle projectionof points. Projection of straight lines.Traces of lines.

UNIT II

PROJECTIONS OF PLANES: Projections of plane figures: circle, square, rhombus, rectangle, triangle, pentagon and hexagon.

UNIT – III

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones Inclined to one plane. .

UNIT –IV

ISOMETRIC PROJECTIONS: Isometric Projection and conversion of Orthographic views into isometric views. (Treatment is limited to simple objects only).

UNIT –V

ORTHOGRAPHIC PROJECTIONS: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

TEXT BOOK:

1. Engineering Drawing with AutoCAD by Dhananjay M. Kulkarni (PHI publication)
2. Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (First angle projection)

REFERENCE BOOKS:

1. Engineering Drawing by Dhananjay A Jolhe, Tata McGraw hill publishers
2. Engineering Drawing by Prof.K.L.Narayana& Prof. R.K.Kannaiah.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Physics Laboratory
I B.Tech– Semester (Code: 18PHL01)
(COMMON TO ALL BRANCHES)

Lectures	**0**	Tutorial	0	Practical	**3**	Credits	**1**
Continuous Internal Assessment			**50**	Semester End Examination (3hours)			**50**

LIST OF EXPERIMENTS

1. Determination of acceleration due to gravity at a place using compound pendulum.
2. Study the variation of intensity of magnetic field along the axis of a circular coil using Stewart-Gee's appa□atus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Dete□□i□atio□ of □adius of □u□□atu□e of a Pla□o □o□□e□ le□s □□fo□□i□g Ne□to□'s □i□gs.
5. Determination of wavelengths of mercury spectrum using grating normal incidence method.
6. Determination of dispersive power of a given material of prism using prism minimum deviation method.
7. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
8. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
9. Verify the laws of transverse vibration of stretched string using sonometer.
10. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
11. Draw the load characteristic curves of a solar cell.
12. Determination of Hall coefficient of a semiconductor.
13. Determination of voltage and frequency of an A.C. signal using C.R.O.
14. Determination of Forbidden energy gap of Si &Ge.
15. Determination of wavelength of laser source using Diode laser.

Any three experiments are virtual

TEXT BOOK:

1. □Engineering physics laboratory manual□P.Srinivasarao&K.Muralidhar,Himalaya publications.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

English Communication Skills Laboratory

18ELL01

Lectures:3 Periods/Week | Continuous Assessment: 50M

Sem End Exam Duration: 3 hours | Sem End Exam : 50M

Credits: 1

UNIT-I

1.1 Listening Skills; Importance – Purpose- Process- Types
1.2 Barriers to Listening
1.3 Strategies for Effective Listening

UNIT-II

2.1 Phonetics; Introduction to Consonant, Vowel and Diphthong sounds
2.2 Stress
2.3 Rhythm
2.4 Intonation

UNIT-III

3.1 Formal and Informal Situations
3.2 Expressions used in different situations
3.3 Introducing Yourself & Others-Greeting & Parting-Congratulating-Giving Suggestions & Advices-Expressing Opinions-Inviting People-Requesting-Seeking Permission-Giving Information- Giving Directions- Sympathizing- Convincing People- Complaining & Apologizing-Thanking Others- Shopping- Travelling- Conversational Gambits

UNIT-IV

4.1 JAM Session
4.2 Debates
4.3 Extempore

Reference Books:

- Communication Skills, Sanjay Kumar and PushpaLata. Oxford University Press. 2011
- Better English Pronunciation, J.D. O' Connor. Cambridge University Press:1984
- New Interchange (4rth Edition), Jack C Richards. Cambridge University Press:2015
- English Conversation Practice, Grant Taylor. McGraw Hill:2001

Software:

- Buzzers for conversations, New Interchange series
- English in Mind series, Telephoning in English
- Speech Solutions, A Course in Listening and Speaking

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Workshop Practice

I B.Tech – I & II Semester (Code: 18MEL02)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives:

1. To impart student knowledge on various hand tools for usage in engineering applications.
2. Be able to use analytical skills for the production of components.
3. Design and model different prototypes using carpentry, sheet metal and welding.
4. Make electrical connections for daily applications.
5. To make student aware of safety rules in working environments.

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

1. Make half lap joint, Dovetail joint and Mortise &Tenon joint
2. Produce Lap joint, Tee joint and Butt joint using Gas welding
3. Prepare trapezoidal tray, Funnel and T-joint using sheet metal tools
4. Make connections for controlling one lamp by a single switch, controlling two lamps by a single switch and stair case wiring.

Syllabus:

1. Carpentry
   a. Half Lap joint
   b. Dovetail joint
   c. Mortise &Tenon joint
2. Welding using electric arc welding process/gas welding
   a. Lap joint
   b. Tee joint
   c. Butt joint
3. Sheet metal operations with hand tools
   a. Trapezoidal tray
   b. Funnel
   c. T-joint
4. House wiring
   a. To control one lamp by a single switch
   b. To control two lamps by a single switch
   c. Stair-case wiring

TEXT BOOKS:

1. P.Kannaiah and K.L.Narayana, Workshop Manual, SciTech Publishers, 2009.
2. K. Venkata Reddy, Workshop Practice Manual, BS Publications, 2008.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Numerical Methods and Advanced Calculus

I B.Tech –II Semester (Code: 18MA002)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)			:	50

Prerequisites: None

Course Objectives:

CO1: To learn about some advanced numerical techniques e.g. solving a nonlinear equation, linear system of equations, Interpolation and Approximation techniques.

CO2: To learn about evaluation of double and triple integrals and their applications.

CO3: To learn some basic properties of scalar and vector point functions and their applications to line,surface and volume integrals.

Course Outcomes: Students will be able to

CLO-1: Solve non-linear equations in one variable and system of linear equations using iteration methods.

CLO-2: Choose appropriate interpolation formulae based on the given data.

CLO-3: Compute the value of a definite integral using numerical integration techniques.

CLO-4: Predict the numerical solution of the derivative at a point from the given initial value problem using appropriate numerical method.

CLO-4 :Evaluate the double and triple integrals using change of variables.

CLO-5: Transformline integrals to surface and surface to volume integrals and evaluate them.

SYLLABUS

UNIT - I

Numerical Solution of Equations: Introduction; Solution of algebraic and transcendental equations: Bisection method, Method of false position, Newton-Raphson method; Useful deductions from the Newton-Raphson formula; Solution of linear simultaneous equations; Direct methods of solution: Gauss elimination method, Gauss-Jordan method, Factorization method; Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method.

[Sections: 28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1;28.7.2]. [12 Hours]

UNIT - II

Finite differences and Interpolation: Finite differences: Forward differences, Backward differences; Newton's interpolation formulae: Newton's forward interpolation formula, Newton's backward interpolation formula; Interpolation with unequal intervals; Lagrange's

interpolation formula; Divided differences; Newton's divided difference formula; Numerical integration; Trapezoidal rule; Simpson's one-third rule; Simpson's three-eighth rule; Numerical solution of ODE's: Introduction; Picard's method; Euler's method; Runge-Kutta method.

[Sections:29.1; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.8; 32.1; 32.2; 32.4; 32.7]. [12 Hours]

UNIT – III

Multiple Integrals: Double integrals; Change of order of integration; Double integrals in polar coordinates; Area enclosed by plane curves; Triple integrals; Volumes of solids: Volume as Triple integrals, Change of variables.

[Sections: 7.1; 7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2]. [12 Hours]

UNIT – IV

Vector calculus and its Applications: Scalar and vector point functions; Del applied to scalar point functions-Gradient: Definition, Directional derivative; Del applied to vector point functions: Divergence, Curl; Line integral; Surfaces: Surface integral, Flux across a surface; Green's theorem in the plane (without proof); Stokes theorem (without proof); Gauss divergence theorem(without proof).

[Sections: 8.4; 8.5.1; 8.5.3; 8.6; 8.11; 8.12; 8.13; 8.14; 8.16] [12 Hours]

TEXT BOOK:

B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCE BOOKS:

[1] ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SEMICONDUCTOR PHYSICS AND NANO MATERIALS

¼ B.Tech II-semester: CODE:18PH003

(Common for CSE,IT,EEE,&EIE)

Lectures	3	Tutorials	0	Practical	0	Credits	3
Continuous Internal Assessment			50	Semester End Examination			50

Course Objectives:

CO1: This unit aim to build the foundation and inspires interest of freshmen into electrical and electronics and to focus on fundamental concepts and basic principles regarding electrical conduction.

CO2: This unit provides various properties of semiconductor materials and their importance in various device fabrications.

CO3: This unit aim to educate the student on various opto-electronic devices and their applications.

CO4: This unit provide information about the principles of processing, manufacturing and characterization of nanomaterials, nanostructures and their applications.

COURSE OUTCOMES:

The students were able to

CLO1: understand concepts of band structure of solids, concept of hole and effective mass of electron in semiconductors.

CLO2: know the concept of Fermi level and various semiconductor junctions.

CLO3: familiar with working principles of various opto-electronic devices and their applications.

CLO4: understand importance of nano-materials and their characteristic properties.

UNIT -I

ELECTRONIC MATERILAS:

Sommerfeld free electron theory, Fermi level and energy, density of states, Failure of free electron theory (Qualitative), Energy bands in solids, E-K diagrams, Direct and Indirect band gaps. Types of Electronic materials: Metals, Semi conductors and Insulators, Occupation Probability, effective mass, Concept of hole.

UNIT – II

SEMICONDUCTORS:

Introduction to semiconductors, intrinsic and extrinsic semiconductors, carrier concentrations, Fermi level and temperature dependence, Continuity equation, Diffusion and

drift, P-N junction (V-I characteristics), Metal – Semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for opto- electronic devices.

UNIT-III
OPTO-ELECTRONIC DEVICES AND DISPLAY DEVICES:
Photo voltaic effect, principle and working of LED, Applications of Photo diode, Solar cell, PIN & APD Diode, Liquid crystal display, Opto electric effect: Faraday Effect and Kerr effect.

UNIT-IV
NANO-MATERIALS:
Introduction to nano technology, quantum confinement, surface to volume ratio, properties of nano materials, synthesis of nano-materials: CVD, sol-gel methods, laser ablation.
Carbon nano tubes: types, properties, applications. Characterization of nano materials: XRD, SEM, applications of nano materials.

TEXT BOOKS:

1. A text book of engineering physics by Avadhanulu and KshirsagarS.Chand& Co. (2013)
2. Applied physics by Dr.*P.SrinivasaRao*. Dr.K.*Muralidhar*
3. Introduction to solid state state physics, Charles Kittel, 8th edition
4. Solid state physics, S.O. Pillai

REFERENCE BOOKS:

1. Text book on Nanoscience and Nanotechnology (2013): B.S. Murty, P. Shankar, Baldev Raj, B.B. Rath and J. Murday, Springer Science & Business Media.
2. Basic Engineering Physics ,Dr.*P.SrinivasaRao*. Dr.K.*Muralidhar*. Himalaya Publications, 2016

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Instrumentation & Nanotechnology
Code : 18 EI 203

Lecture :	3 hours/week	**Continuous Assessment:**	50 M
Credits :	3	**Semester Exam :**	50M
Code :	18CY002	**Time of SEE :**	3 hrs

PREREQUISITES:

COURSE OBJECTIVES:

The student should be conversant:

CO1: To make students understand the role of chemistry in various Nano particles.

CO2: To enhance knowledge about the various Nano synthetic techniques and their applications.

CO3: To introduce the students to basic principles, constructions and applications of different batteries.

CO4: To make students understand different analytical techniques and their importance.

COURSE OUTCOME:

After studying this course, students will be able to:

CLO-1: Having capacity to innovate a variety of nonmaterials for engineering applications

CLO-2: Design economically and new methods of synthesis nanomaterials.

CLO-3: Have the knowledge of converting various forms of energies into most needy electrical energy efficiently and economically to reduce usage of renewable energy sources.

CLO-4: Explain instrumentation and applications of UV-Visible, I.R spectroscopy, and various analytical techniques.

UNIT-I: Nano Chemistry 12Hrs.

Introduction to Nano chemistry- Nanoparticles-properties, Introduction to Nanostructures: Carbon Nanotubes (CNT), Graphenes, Fullerenes,Nano Peapods, Quantum Dots and Semiconductor Nanoparticles Metal-based Nanostructures (Iron Oxide Nanoparticles) Nanowires Polymer-based Nanostructures including dendrimers.

UNIT-II: Synthesis of Nanoparticles 12Hrs.

Chemical Vapour Deposition (CVD) Chemical precipitation and coprecipitation;Metalnanocrystals by reduction, Sol - gel synthesis - Microemulsions or reverse micelles, micelle formation – Chemical Reduction - Emulsions, and Dendrimers - Microwave heating synthesis - Sonochemical synthesis – Electrochemical synthesis - Photochemical synthesis.

Engineering applications- Drug delivery, Fabric, Reactivity of materials, Micro/ Nano Electro mechanical systems.

12Hrs.

UNIT-III: Batteries

Different types of batteries- primary, secondary and flowcells. Working principle and uses- Laclanche cell, alkaline battery, Ni-Cd battery and Lithium, Lithium ion batteries.

Lead acid storage cell, charging and discharging principles- operation and uses, Solar battery- its working principle and applications, electrochemical sensors.

UNIT-IV: ANALYTICAL TECHNIQUES 12Hrs.

Beer-Lambert's law (problem) – UV-visible and IR spectroscopy– principles, instrumentation (block diagram only) and Applications. Estimation of iron by colorimetry – flame photometry – principle – instrumentation (block diagram only) – estimation of sodium by flame photometry – atomic absorption spectroscopy – principles – instrumentation (block diagram only) – estimation of nickel by atomic absorption spectroscopy

TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi (2002).

2. Rao C. N., A. Muller, A. K. Cheetham, "Nanomaterials Chemistry", Wiley- VCH, 2007.

REFERENCE BOOKS:

1. B.K. Sharma "Engineering Chemistry" Krishna Prakasan Media (P) Ltd., Meerut (2001).

2. Engineering Chemistry J.C Kuriacase&J.Rajaram, Tata McGraw Hills co., New Delhi 1. (2004).

3. Text Book of Engineering Chemistry - ShasiChawla, DhanpatRai publishing company, New Delhi (2008).

4. Kenneth J. Klabunde, "Nanoscale materials in chemistry", Wiley Interscience Publications, 2001.

5. Sergeev G.B., "Nanochemistry", Elseiver publication, 2006.

6. Nanoparticles: From theory to applications – G. Schmidt, Wiley Weinheim 2004.

7. T. Pradeep, A Textbook of Nanoscience and Nanotechnology, Hardcover – 2012

.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Basic Electrical Engineering
(E&I)
I B.Tech – II Semester (Code: 18EE002)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50		Semester End Examination (3 Hours)		:	50

Prerequisites: Mathematics, Physics

Course Objectives:

CO1: To understand basic Laws in circuits, analysis of simple DC circuits, Theorems and its applications.

CO2: To learn basic concepts of AC circuits, its analysis and analysis of three phase balanced circuits.

CO3: To understand working principle, construction, applications and performance of DC machines, AC machines.

CO4: To gain knowledge about electrical insulators.

Course Outcomes: Students will be able to

CO1: Solve problems involving with DC excitation sources in electrical circuits.

CO2: Solve problems involving with AC excitation sources in electrical circuits.

CO3: Analyze construction, principle of operation, application and performance of DC machines and AC machines.

CO4: Aware importance of electrical insulators.

Unit 1 : DC Circuits

Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation.Superposition, Thevenin and Norton Theorems.Time-domain analysis of first-order RL and RC circuits.

Unit2: AC Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), Three-phase balanced circuits, voltage and current relations in star and delta connections.

Unit 3: Electrical Machines

Magnetic materials, BH characteristics, Construction, working of DC machines, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency.Auto-transformer and three-phase transformer connections.Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor.Construction and working of synchronous generators.

Unit 4: Electrical Installations

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthling. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXT BOOK:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", 4th edition, Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2012.

Reference Books:

1. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 1996.
2. E. Hughes, "Electrical and Electronics Technology", 10th edition, Pearson, 2011.
3. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Environmental Studies

I B.Tech – I/II Semester (Code: 14CE001)

Lectures	4	Tutorial	0	Practical	0	Credits	2
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives: To learn

CO1: To develop an awareness,knowledge, and appreciation for the naturalenvironment.

CO2: To understand different types of ecosystems exist in nature.

CO3: To know our biodiversity.

CO4: To understand different types of pollutants present in Environment.

CO5: To know the global environmental problems.

Course Outcomes: Students will be able to

CLO 1: Develop an appreciation for the local and natural history of the area.

CLO 2: Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of people's movements focusing on environment.

CLO 3: Know how to manage the harmful pollutants.

CLO 4: Gain the knowledge of Environment.

CLO 5: Create awareness among the youth on environmental concerns important in the long-term interest of the society

UNIT – I

Introduction: Definition, Scope and Importance, Need for public awareness. Ecosystems: Definition, Structure and Functions of Ecosystems, types - Forest, Grassland, Desert, Aquatic (Marine, pond and estuaries). *6 periods*

Biodiversity: Definition and levels of Biodiversity; Values of Biodiversity - Consumptive, Productive, Social, Aesthetic, Ethical and Optional; Threats and Conservation of Biodiversity; Hot Spots of Biodiversity, Bio-geographical Classification of India, India as a mega diversity nation. *Chipko movement case study* *6 periods*

UNIT – II

Natural resources: Land: Land as a resource, Causes and effects of land degradation - Soil erosion, Desertification. **Forest**: Use of forests, Causes and effects of deforestation, Afforestation, Mining - benefits and problems. **Water**: Uses, floods and drought, Dams - benefits and problems.

Energy: Importance of energy, Environmental Impacts of Renewable and Non-renewable energy resources. *Silent Valley Project and Narmada BachaoAndolan case studies8 periods*

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management. Fieldwork on Rain water harvesting and Watershed management. *6 periods + 6 hours field work/Demonstration*

UNIT – III

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; *Chernobyl Nuclear Disaster* case study; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting. *12 periods*

Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act.
6 periods

UNIT – IV

Environmental issues: Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.Environmental Standards (ISO 14000, etc.) *12 periods*
Case Studies: Bhopal Tragedy, Mathura Refinery and TajMahal, and Ralegan Siddhi (Anna Hazare). *6 periods*

Field work: Visit to a local area to document environmental assets – Pond/Forest/Grassland. Visit to a local polluted site- Urban and industry/ Rural and Agriculture. *6 hrs.*

TEXT BOOKS:

1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.
3. Text Book of environmental Studies – ErachBharucha

REFERENCE BOOKS:

1. "Environmental studies", R.Rajagopalan, Oxford University Press.
2. "Introduction to Environmental Science", Anjaneyulu Y, B S Publications
3. "Environmental Science", 11th Edition – Thomson Series – By Jr. G. Tyler Miller.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

PROBLEM SOLVING USING PROGRAMMING

(Common for all branches except Civil Engineering)

I B.Tech – II Semester (Code:18CS001)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: BASIC MATHEMATICS

Course Objectives: Students will be able to

1. Understand basic concepts of C Programming such as: C-tokens, Operators, Input/output, and Arithmetic rules.
2. Develop problem-solving skills to translate 'English' described problems into programs written using C language.
3. Use Conditional Branching, Looping, and Functions.
4. Apply pointers for parameter passing, referencing and differencing and linking data structures.
5. Manipulate variables and types to change the problem state, including numeric, character, array and pointer types, as well as the use of structures and unions, File.

Course Outcomes:

After the course the students are expected to be able to

1. Choose the right data representation formats based on the requirements of the problem.
2. Analyse a given problem and develop an algorithm to solve the problem.
3. Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.
4. Write the program on a computer, edit, compile, debug, correct, recompile and run it.
5. Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

NIT I (17 Periods)

Overview of C, Constants, Variables and Data Types, Operators and Expressions,Managing I/O Operations. Decision Making and Branching.

Programming Exercises for Unit I:C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic and logical errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, Programs using Scientific and Engineering formulae. Finding the largest of the three given numbers.Computation of discount amount on different types of products with different

discount percentages. Finding the class of an input character, finding the type of triangle formed with the given sides, computation of income-tax, finding given year is leap year or not, and conversion of lower case character to its upper case.

UNIT II (17 Periods)

Decision Making and Looping, Arrays, Character Arrays and Strings.

Programming Exercises for Unit II: To print the sum of the digits of a given number and to display the image of a given number. To find whether a given number is prime, printing Fibonacci sequence and to find prime factors of a given number.To print graphic patterns of symbols and numbers.To find the length of a string, compare strings, reverse a string, copy a string and to find whether the given string is palindrome or not with and without using String Handling Functions. Transpose of a matrix and sorting of names using arrays.

UNIT III (18 Periods)

User-defined Functions,Structures and Unions,Pointers

Programming Exercises for Unit - III: Functions - Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic. Swapping two variable values. Sorting a list of student records on register number using array of pointers

UNIT IV (18 Periods)

File Management in C,Dynamic Memory Allocation,Preprocessor

Programming Exercises for Unit - IV: Operations on complex numbers, and to read an input file of marks and generate a result file, sorting a list of names using command line arguments. Copy the contents of one file to another file. Allocating memory to variables dynamically.

Text Book:

1. **Programming in ANSI C by E.Balaguruswamy,Fifth Edition.**

References:

1. Kernighan BW and Dennis Ritchie M, “C programming language”, 2nded, Prentice Hall.
2. Yashavant P. Kanetkar, “Let us C”, BPB Publications.
3. Herbert Schildt, “C: The Complete Reference”, 4th edition, Tata Mcgraw-Hill.
4. Ashok N.Kamthane, “Programming in C”, PEARSON 2nd Edition.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

ENGINEERINGCHEMISTRY LABORATORY

(Common to all branches)

I B.Tech – I/II Semester (Code: 18CYL01)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

LIST OF EXPERIMENTS

1. **Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals likeCalibration of Volumetric Apparatus, Primary, Secondary Solutions, Normality, Molarity, Molality etc. anderror, accuracy, precision, theory of indicators, use of volumetric titrations).

2. **Volumetric Analysis:**
   a. Estimation of Washing Soda.
   b. Estimation of Active Chlorine Content in Bleaching Powder
   c. Estimation of Mohr's salt by permanganometry.
   d. Estimation of given salt by using Ion-exchange resin using Dowex-50.
3. **Analysis of Water:**
   a. Determination of Alkalinity of Tap water.
   b. Determination of Total Hardness of ground water sample by EDTA method
   c. Determination of Salinity of water sample
4. **Estimation of properties of oil**:
   a. Estimation of Acid Value
   b. Estimation of Saponification value
5. **Preparations:**
   a. Preparation of Soap
   b. Preparation of Urea-formaldehyde resin
   c. Preparation of Phenyl benzoate
6. **Demonstration Experiments (Any two of the following):**
   a. Determination of $p^H$of given sample.
   b. Determination of conductivity of given sample by conductometer.
   c. Potentiometric Determination of Iron.

TEXT BOOKS (for Chemistry 1 and 2):

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad, 2009.
2. Inorganic quantitative analysis, Vogel, 5^{th} edition, Longman group Ltd. London, 1979.

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R.n. Goyal and HarrmendraGoel.
2. A text book on experiments and calculations- Engineering Chemistry. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Basic Electrical Engineering Lab

I B.Tech – II Semester (Code: 18EEL02)

Lectures	0	Tutorial	0		Practical	3	Credits	1	
Continuous Internal Assessment			:	50	Semester End Examination (3 Hours)			:	50

Lab experiments

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Verification of Thevenin's theorem
4. Verification of Norton's theorem
5. Time domain analysis of RL series circuit
6. Time domain analysis of RC series circuit
7. Parameters of choke coil
8. Measurement of line and phase quantities in 3-phase star connected load
9. Measurement of line and phase quantities in 3-phase delta connected load
10. Measurement of low and medium resistance using volt ampere method
11. OC & SC test of single phase transformer
12. Load test on single phase transformer
13. Load test on three-phase induction motor
14. Speed control of three-phase induction motor
15. Fuse characteristics

Note: Minimum 10 experiments should be carried.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Problem Solving using Programming(Lab)

I B.Tech – II Semester (Code: 18CSL01)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment	:	50	Semester End Lab Examination (3 Hours)			:	50

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if-elsestatement).

Domestic Customer:		
Consumption Units	**Rate of Charges(Rs.)**	
0 – 200	0.50 per unit	
201 – 400	100 plus	0.65 per unit
401 – 600	230 plus	0.80 per unit
601 and above	390 plus	1.00 per unit
Commercial Customer:		
Consumption Units	**Rate of Charges(Rs.)**	
0 – 100	0.50 per unit	
101 – 200	50 plus	0.6 per unit
201 – 300	100 plus	0.70 per unit
301 and above	200 plus	1.00 per unit

2. Write a C program to evaluate the following (usingloops):
   a) $1 + x^2/2! + x^4 / 4!+$ …upto tenterms
   b) $x + x^3/3! + x^5/5!+$ … upto ten terms
3. Write a C program to check whether the given numberis
   a) Prime ornot.
   b) Perfect or Abundant orDeficient.
4. Write a C program to display statistical parameters (using one – dimensionalarray).
   a) Mean
   b) Mode
   c) Median
   d) Variance.
5. WriteaCprogramtoreadalistofnumbersandperformthefollowingoperations
   a) Print thelist.
   b) Delete duplicates from thelist.
   c) Reverse thelist.
6. Write a C program to read a list of numbers and search for a given number using Binary search algorithm and if found display its index otherwise display the message “Element not found in theList”.

7. Write a C program to read two matrices and compute their sum andproduct.

8.Write a C program to read list of student names and perform the following operations

a) To print the list of names.

b) To sort them in ascending order.

c) To print the list after sorting.

9. Write a C program that consists of recursive functions to

a) Find factorial of a given number

b) Solve towers of Hanoi with three towers (A, B & C) and three disks initially on tower A.

10. A Bookshop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book the sales person inputs the title and the author, and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed, if it is, then the system displays the book details and request for the number of copies required ,if the requested copies are available the total cost of the requested copies is displayed otherwise the message “required copies not in stock” is displayed. Write a program for the above in structures with suitable functions.

11. Write a C program to read a data file of students’ records with fields(Regno, Name, M1,M2,M3,M4,M5) and write the successful students data (percentage > 40%) to a data file.

12. Write a C program to read a file as command line argument and count the given word frequency in a file

Notes