BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
For
Computer Science and Engineering
Effective from the Academic Year 2018-2019 (R18 Regulations)
Forth Year B.Tech (SEMESTER – VIII)

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	
18ME005	Industrial Management & Entrepreneurship Development	4	0	0	4	50	50	100	3
18_ _I_ _	**Institutional Elective -II**	4	0	0	4	50	50	100	3
18CSD5_	**Department Elective - V**	4	0	0	4	50	50	100	3
18CSP02	Project - II	0	0	10	10	75	75	150	10
	TOTAL	12	0	10	22	225	225	450	19

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

Department Elective - V	
18CSD51	Protocols for Secure Electronic Commerce
18CSD52	Artificial Neural Networks and Deep Learning
18CSD53	Natural Language Processing.

Institutional Elective – II	
18CE103	Disaster Management
18CE104	Remote Sensing &GIS
18CS103	Python Programming
18CS104	Computer Networks
18ECI03	Wireless Communications
18ECI04	Artificial Neural Networks
18EEI03	High Voltage Engineering
18EEI04	Electrical Energy Conservation & Auditing
18EII03	Robotics and Automation
18EII04	Sensors and Signal Conditioning
18ITI03	Mobile Application Development
18ITI04	Web Technologies

18ME103	Non-Conventional Energy Sources
18ME104	Automobile Engineering
18PH103	Advanced Materials
18PH104	Opto Electronic Devices and Applications
18EL004	English for Competitive Examinations
18NC001	NCC (National Cadet Corps)

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Industrial Management & Entrepreneurship Development IV B.Tech – VIII Semester (Code:18ME005)			
Lectures :	**4** Periods / Week	Continuous Internal Assessment :	**50** Marks
Final Exam :	**3** hours	Semester End Exam :	**50** Marks
UNIT-I			13 Periods

General management: Management definition, Functions of Management and Principles of Management.
Forms of Business Organization: Salient features of Sole Proprietorship, Partnership, Joint Stock Company, Private Limited and Public Limited companies; Merits and Demerits of above types
Marketing Management: Functions of Marketing, Concepts of Selling and Marketing, Marketing mix (4 Ps); Advertising and sales promotion; Product life cycle.

UNIT-II	13 Periods

Production Management: Types of production systems, Productivity vs. Production, Production planning and control.
Materials Management: Inventory Control, Basic EOQ model, ABC analysis.
Quality Control: Control Charts: chart, R chart, P chart, C chart, Acceptance sampling.

UNIT-III	12 Periods

Financial Management: Functions of finance, Types of Capital-Fixed and Working Capital, Break Even Analysis.
Depreciation: Straight line method of depreciation, declining balance method and the Sum of Years digits method of Depreciation.
Personnel Management: Functions of personnel management, human resource planning, recruitment, selection, placement, training and development and performance appraisal. Motivation theories, leadership styles

UNIT-IV	12 Periods

Entrepreneurship Development: Introduction, Entrepreneurial characteristics, Functions of an Entrepreneur; Factors affecting entrepreneurship; Role of communication in entrepreneurship; Entrepreneurial Development-Objectives, Need of Training for enterprises; Finance for the enterprises; Product, Process and Plant Design- Product analysis and Product Design process. Steps in process design and Plant Design.

Text Book(s) :	1. Industrial Engineering and Operations Management, S.K.Sharma, Savita Sharma and Tushar Sharma. 2. Industrial Engineering and Production Management, Mahajan. 3. Management Science, A.R.Aryasri
References :	1. Operations Management, Joseph G Monks. 2. Marketing Management, Philip Kotler. 3. The Essence of Small Business, Barrow colin.

INSTITUTIONAL ELECTIVE - II	
(Common for all branches) IV B.Tech – VIII Semester (Code: 18__I__)	
Lectures :	**4** Periods / Week	Continuous Internal Assessment :	**50** Marks
Final Exam :	**3** hours	Semester End Exam :	**50** Marks

List of the Subjects	
18CE103	Disaster Management
18CE104	Remote Sensing &GIS
18CS103	Python Programming
18CS104	Computer Networks
18ECI03	Wireless Communications
18ECI04	Artificial Neural Networks
18EEI03	High Voltage Engineering
18EEI04	Electrical Energy Conservation & Auditing
18EII03	Robotics and Automation
18EII04	Sensors and Signal Conditioning
18ITI03	Mobile Application Development
18ITI04	Web Technologies
18ME103	Non-Conventional Energy Sources
18ME104	Automobile Engineering
18PH103	Advanced Materials
18PH104	Opto Electronic Devices and Applications
18EL004	English for Competitive Examinations
18NC001	NCC (National Cadet Corps)
More Details Please refer Annexure 2	

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Protocols for Secure Electronic Commerce Department Elective - V IV B.Tech – VIII Semester (Code: 18CSD51)			
Lectures :	**4** Periods / Week	Continuous Internal Assessment :	**50** Marks
Final Exam :	**3** hours	Semester End Exam :	**50** Marks

UNIT-I	15 Periods

Overview of Electronic Commerce: Electronic Commerce and Mobile Commerce, Effects of the Internet and Mobile Networks, Network Access, Barcodes, Smart Cards, Parties in Electronic Commerce, Security.

Money and Payment Systems: Mechanisms of Classical Money, Payment Instruments, Types of Dematerialized Monies, Purses, Holders, and Wallets, Transactional Properties of Dematerialized Currencies, Overall Comparison of the Means of Payment, Practice of Dematerialized Money, Clearance and Settlement in Payment Systems, Drivers of Innovation in Banking and Payment Systems.

UNIT-II	15 Periods

Transport Layer Security and Secure Sockets Layer: Architecture of SSL/TLS, SSL/TLS Security Services, SSL/TLS Subprotocols, Performance of SSL/TLS, Implementation Pitfalls.

The SET Protocol: SET Architecture, Security Services of SET, Certification, Purchasing Transaction, Optional Procedures, Efforts to Promote SETs, SET versus TLS/SSL.

UNIT-III	15 Periods

Payments with Magnetic Stripe Cards: Point-of-Sale Transactions, Communication Standards for Card Transactions, Security of Point-of-Sale Transactions, Internet Transactions, 3-D Secure, Migration to EMV.

Secure Payments with Integrated Circuit Cards: Description of Integrated Circuit Cards, Integration of Smart Cards with Computer Systems, Standards for Integrated Circuit Cards, Multi Application Smart Cards, Security of Integrated Circuit Cards, Payment Applications of Integrated Circuit Cards, EMV Card, General Consideration on the Security of Smart Cards.

UNIT-IV	15 Periods

Mobile Payments: Reference Model for Mobile Commerce, Secure Element in Mobile Phones, Barcodes, Bluetooth, Near-Field Communication, Text Messages, Bank-Centric Offers, Mobile Operator–Centric Offers, Third-Party Service Offers, Collaborative Offers, Payments from Mobile Terminals.

Micropayments: Characteristics of Micropayment Systems, Standardization Efforts, Electronic Purses, Online Micropayments.

PayPal.: Evolution of PayPal, Evolution of PayPal, Business Accounts.

Digital Money: Privacy with Cash and Digital Money, DigiCash (eCash), Anonymity and Untraceability in DigiCash, Splitting of Value, Detection of Counterfeit (Multiple Spending), Evaluation of DigiCash.

Text Book(s) :	1. Protocols for Secure Electronic Commerce by Mostafa Hashem

	Sherif, CRC Press (2016).
References :	1. Secure Electronic Commerce by Ford & Baum, Pearson Education India. 2. Secure E-Commerce Systems by P. S. Lokhande and B B Meshram, Amazon Asia-Pacific Holdings Private Limited.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Artificial Neural Networks and Deep Learning
Department Elective - V
IV B.Tech – VIII Semester (Code: 18CSD52)

Lectures :	**4** Periods / Week	Continuous Internal Assessment :	**50** Marks
Final Exam :	**3** hours	Semester End Exam :	**50** Marks

UNIT-I	13 Periods

Multi-layer perceptron – Training, Activation functions, Recognizing handwritten digits, One-hot encoding (OHE), Defining a simple neural network in TensorFlow, Running a simple TensorFlow, Improving the simple net, Dropout, Optimizers, Epochs, Optimizer learning rate, Increasing the number of internal hidden neurons, Regularization, Sentiment analysis, Hyper parameter tuning.

UNIT-II	13 Periods

Convolutional Neural Networks - Deep Convolutional Neural Network (DCNN), local receptive fields, shared weights and bias, A mathematical example, Convnets in TensorFlow, pooling layers, max pooling, average pooling. LeNet and CIFAR-10, classification with VGG16 Net.

UNIT-III	12 Periods

Generative Adversarial Networks - What is a GAN, MNIST using GAN in TensorFlow, Deep convolutional GAN (DCGAN), and DCGAN for MNIST digits.
Word embeddings – Origins and fundamentals, Distributed representations, Static embeddings, Word2Vec, GloVe, Creating your own embedding using genism, Exploring the embedding space with genism, Using word embeddings for spam detection.

UNIT-IV	12 Periods

Recurrent Neural Networks - The basic RNN cell, back propagation through time (BPTT), vanishing and exploding gradients, RNN cell variants, Long short-term memory (LSTM), Gated recurrent unit (GRU), peephole LSTM, RNN variants, Bidirectional RNNs, stateful RNNs, RNN topologies- One-to-Many, Many-to-One, Many-to-Many – POS tagging, Encoder-Decoder architecture – seq2seq

Text Book(s) :	1. Deep Learning with TensorFlow 2 and Keras, Antonio Gulli, Amita Kapoor, Sujit Pal, second edition, Packt publishers.
References :	1. Deep Learning by Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press. 2. Deep Learning: Methods and Applications by Li Deng, Dong Yu, 3. Now Publishers. 4. Neural Networks and Deep Learning by Michael Nielsen, Determination Press.

Natural Language Processing Department Elective - V IV B.Tech – VIII Semester (Code:18CSD53)		
Lectures :	**4** Periods / Week	Continuous Internal Assessment :	**50** Marks
Final Exam :	**3** hours	Semester End Exam :	**50** Marks
colspan="3"	**UNIT-I**	13 Periods
Introduction: - Understanding natural language processing, Understanding basic applications, Advantages of togetherness-NLP and Python, Environment setup for NLTK. **Practical Understanding of a Corpus and Database**: - What is a corpus? Why do we need a corpus? Understanding corpus analysis, Understanding types of data attributes, Exploring different file formats for corpora, Resources for accessing free corpora, Preparing a dataset for NLP applications, Web scraping.		
colspan="3"	**UNIT-II**	13 Periods
Understanding the Structure of a Sentence: - Understanding components of NLP, Natural language understanding, Defining context-free grammar, Morphological analysis, Syntactic analysis, Discourse integration, Pragmatic analysis.		
colspan="3"	**UNIT-III**	12 Periods
Preprocessing: - Handling corpus-raw, Handling corpus-raw sentences, Basic preprocessing, Practical and customized preprocessing.		
colspan="3"	**UNIT-IV**	12 Periods
Feature Engineering and NLP Algorithms:- Understanding feature engineering, Basic feature of NLP, Basic statistical feature of NLP, Advantages of features engineering, Challenges of features engineering.		
Text Book(s) :		1. Python Natural Language Processing (Packt Publishers) Author: Jalaj Thanaki	
References :		1. Natural Language Processing (Oxford Publishers) Author: Tanvir Siddiqui	

PROJECT - II			
IV B.Tech – VIII Semester (Code: 18CSP02)			
Practicals :	**10** Periods / Week	Continuous Internal Assessment :	**50** Marks
Final Exam :	**3** hours	Semester End Exam :	**50** Marks

The Project work shall be carried out by a batch consisting not more than four students for one semester. It should help the students to comprehend and apply different theories and technologies that they have learnt through and are learning. It should lead to a substantial result as a comparative study, a new application of the technologies available or some extension to the works carried out by some researcher and published in referred journals. Each batch must carry out the analysis, design, implementation and testing of the entire project basing on the Software Engineering principles. There shall be a total of four reviews made by the batch regarding:

1. 0th Review : The idea/concept which forms the basis for their project shall be presented to the guide, concerned in charge and classmates and shall get the approval for Continuation.
2. 1st Review : The analysis and design carried out.
3. 2nd Review : The implementation and the testing done.
4. 3rd Review : Over all Presentation of the work carried out and the results found out for the valuation under the internal Assessment.

A comprehensive report on the lines of IEEE Format is to be submitted at the end of the semester, which is certified by the concerned guide and the HOD.
There shall be an external guide appointed by the Principal/Controller of Examiner to make an assessment and to carry out the Viva-Voce examination.

Annexure - 2

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
DISASTER MANAGEMENT
IV B.Tech – II Semester (Code: 18CE103)

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

Course Objectives: The subject provides
1. Clear knowledge of Disaster, Hazards and Vulnerabilities.
2. Knowledge of Mechanism of Disaster Management.
3. Clear idea of Capacity Building.
4. Explains how to do the planning for disaster management.

Course Outcomes: At the end of the course student will be able to
1. Understands Disaster, Man-made Hazards and Vulnerabilities.
2. Understands Disaster Management Mechanism
3. Understands Capacity Building Concepts
4. Understands Planning of Disaster Managements

UNIT-I
Understanding Disaster: Concept of Disaster - Different approaches- Concept of Risk - Levels of Disasters - Disaster Phenomena and Events (Global, national and regional)
Hazards and Vulnerabilities: Natural and man-made hazards; response time, frequency and forewarning levels of different hazards - Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards.

UNIT-II
Disaster Management Mechanism: Concepts of risk management and crisis managements -Disaster Management Cycle - Response and Recovery - Development, Prevention, Mitigation and Preparedness - Planning for Relief.

UNIT-III
Capacity Building: Capacity Building: Concept - Structural and Nonstructural Measures Capacity Assessment; Strengthening Capacity for Reducing Risk - Counter-Disaster Resources and their utility in Disaster Management - Legislative Support at the state and national levels

UNIT-IV
Coping with Disaster: Coping Strategies; alternative adjustment processes – Changing Concepts of disaster management - Industrial Safety Plan; Safety norms and survival kits -Mass media and disaster management.
Planning for disaster management: Strategies for disaster management planning - Steps for formulating a disaster risk reduction plan - Disaster management Act and Policy in India -Organizational structure for disaster management in India - Preparation of state and district disaster management plans.

TEXT BOOKS:
1. Manual on Disaster Management, National Disaster Management, Agency Govt of India.
2. Disaster Management by MrinaliniPandey Wiley 2014.

3. Disaster Science and Management by T. Bhattacharya, McGraw Hill Education (India) Pvt Ltd Wiley 2015.

REFERENCES:
1. Earth and Atmospheric Disasters Management, N. Pandharinath, CK Rajan, BS Publications 2009.
2. National Disaster Management Plan, Ministry of Home affairs, Government of India (http://www.ndma.gov.in/images/policyplan/dmplan/draftndmp.pdf)

Institution Elective - II
REMOTE SENSING &GIS
IV B.Tech – II Semester (Code: 18CE104)

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

Course Objectives:
1. Learn basic concepts of Aerial Photographs.
2. Learn basic concepts of remote sensing and its characteristics, satellite sensors and platforms.
3. Know about satellite digital image processing and classification techniques.
4. Understand the basic concepts GIS, spatial data and analysis
5. Applications of GPS in surveying.
6. Know various remote sensing and GIS applications in civil engineering

Course Outcomes:
1. Interpret Information from Aerial Photographs.
2. Exposure on Basics of Remote Sensing, Satellite Sensors and Platforms, Practical Knowledge on Satellite Image Classification.
3. Know Basics of GIS And Map Making. Exposure about Spatial Analysis Using Overlay Tools.
4. Geo-Tag Assets Using GPS And Add Attribute & Meta-Data.
5. Get the Knowledge on Various Remote Sensing and GIS Applications in Civil Engineering.

UNIT- I
PHOTOGRAMMETRY: Fundamentals of Photogrammetry and Photo interpretation – types of photographs; Vertical photographs – principal point; scale; Stereoscopy; Overlap, side lap and flight planning.

UNIT – II
REMOTE SENSING:
Introduction to Remote Sensing: Basic concepts of remote sensing, electromagnetic radiation, electromagnetic spectrum, interaction with atmosphere and target.
Sensors and platforms: Introduction, types of sensors, airborne remote sensing, Space-borne remote sensing. Visual Interpretation Techniques. Overview of Indian Remote sensing satellites and sensors, satellite definition and types, characteristics of satellite, characteristics of satellite orbit

UNIT – III
GEOGRAPHIC INFORMATION SYSTEM (GIS)
Introduction, key components, data entry &preparation – Spatial data input, Raster Data Model, Vector Data Model, Raster Vs Vector, advantages and disadvantages of Raster & Vector network analysis - concept and types, Data storage-vector data storage, attribute data storage.

UNIT - IV
GLOBAL POSITIONING SYSTEM (GPS)&RS AND GISAPPLICATIONS:
GPS definition, components of GPS, GPS receivers. Space, Control and User segments of GPS. Advantages and disadvantages of GPS, Limitations and applications of GPS Indian Systems (IRNSS, GAGAN)Development of GPS surveying techniques, Navigation with GPS, Applications of GPS.
Applications: Photogrammetry, Remote Sensing and Geographical information Systems

TEXT BOOKS:
1. Bhatta B (2008), 'Remote sensing and GIS', Oxford University Press
2. Chang, K. T. (2006). Introduction to Geographic Information Systems. The McGraw-Hill.
3. Lillesand, T.M, R.W. Kiefer and J.W. Chipman (2013) 'Remote Sensing and Image Interpretation', Wiley India Pvt. Ltd., New Delhi
4. Schowenger, R. A (2006) 'Remote Sensing' Elsevier publishers.
5. Parkinson, B. W., Spilker, J. J. (Jr.) (1996). Global Positioning System: Theory & Applications (Volume-I). AIAA, USA

REFERENCE BOOKS:

1. 'Fundamentals of Remote Sensing' by George Joseph, Universities Press, 2013.
2. 'Fundamentals of Geographic Information Systems' by Demers, M.N, Wiley India Pvt.Ltd, 2013.
3. Jensen John R. Introduction to Digital Image Processing: A Remote Sensing Perspective Prentice hall, New Jersey
4. Paul Wolf, Elements of Photogrammetry, McGraw Hill.
5. Leick Alfred, 1995: GPS Satellite Surveying, Wiley Inter science
6. Burrough, P. P. & McDonnel, R. A. (1998). Principles of GIS. Oxford University Press.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II **PYTHON PROGRAMMING** IV B. Tech. – VIII Semester (Code: 18CSI03)					
Lectures	:	4 Periods/Week	Continuous Assessment	:	50
Final Exam	:	3 hours	Final Exam Marks	:	50

Pre-Requisite: None.	
Course Objectives:	
CO1	Understand and write code using the basics of Python, Statements, Expressions, Conditional Executions, and Functions.
CO2	Write code for Iteration, Strings, File I/O.
CO3	Write code in creating, usage of Lists, Dictionaries, and Tuples.
CO4	Understand the concepts of Object Orientation, Databases and write code implementing them.
Course Outcomes: Students will be able to:	
CLO-1	Understanding of scripting and the contributions of python language.
CLO-2	Understanding of Python especially the object- oriented concepts, using databases.
CLO-3	Able to design and implement machine learning solutions to classification, regression.
CLO-4	Able to design and implement machine learning solutions to clustering problems and features of various data.

UNIT-1	(12 Periods)

Introduction: Overview, History of Python, Python Features, Environment Setup. Variables, expressions, and statements: values and types, variables, names and keywords, statements, operators and operands, expressions, order of operations, modulus operator, string operations, asking the user for input, comments, choosing mnemonic variable names.

Conditional execution: Boolean expressions, logical operators, conditional execution, Alternative execution, chained conditionals, nested conditionals, catching exceptions using try and except, short-circuit evaluation of logical expressions.

Iteration: updating variables, the while statement, infinite loops and break, finishing iterations with continue, definite loops using for, loop patterns.

UNIT-2	(12 Periods)

Functions: function calls, built-in functions, type conversion functions, random numbers, math functions, adding new functions, definitions and uses, flow of execution, parameters and arguments, fruitful functions and void functions.

Strings: string is a sequence, getting the length of a string using len, traversal through a string with a loop, string slices, strings are immutable, looping and counting, the in operator, string comparison, string methods, parsing strings, format operator.

FileI/O: persistence, opening files, text files and lines, reading files, searching through a file, letting the user choose the file name, using try except and open, writing files.

UNIT-3	(12 Periods)

Lists: a list is a sequence, lists are mutable, traversing, operations, slices, methods, deleting elements, functions, strings, parsing lines, objects and values, aliasing, arguments.

Tuples: tuples are immutable, comparing tuples, tuple assignment, dictionaries and tuples, multiple assignmentwith dictionaries, the most common words, using tuples as keys in dictionaries, sequences.

Sets: Introduction, access set items, add set items, remove set items, loop sets, join sets, set methods.

Dictionaries: Dictionary as a set of counters, dictionaries and files, looping and dictionaries, advanced text parsing.

UNIT-4	(12 Periods)

Regular Expressions: Character matching in regular expressions, Extracting data using regular expressions, Combining searching and extracting, Escape character.

Object-Oriented Programming: Managing Larger Programs, Using Objects, starting with Programs, Subdividing a Problem–Encapsulation, First Python Object, Classes as Types, Object Lifecycle, Many Instances.

Using Databases and SQL: Database concepts, Database Browser for SQLite, creating a database table, Structured Query Language summary, Basic data modeling, Programming with multiple tables, three kinds of keys, Using JOIN to retrieve data.

Text Books :	1. Python for Everybody, Charles Severance
References :	1. W3Schools - https://www.w3schools.com/python/ 2. A Python Book: Beginning Python, Advanced Python, and Python Exercises, Dave Kuhlman, Open Source MIT License.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
COMPUTER NETWORKS
IV B.Tech- VIII Semester (Code: **18CSI04**)

Lectures:	4 periods/week	Continuous Internal Assessment:	50 marks
Final Exam:	3 Hours	Semester End Exam:	50 marks

Course Objectives:
At the end of the course, the students will be able to:
1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Learning Outcomes:
After completing this course the student must demonstrate the knowledge and ability to:
1. Understand and explain Data Communications System and its components and Identify the different types of network topologies and protocols.
2. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
3. Understand and building the skills of subnetting and routing mechanisms.
4. Familiarity with the application layer protocols of computer networks, and how they can be used to assist in network implementation.

UNIT-I	14 Periods

Data Communications & Networking Overview: A Communications Model, Data Communications, Data Communication Networking.
Protocol Architecture: The Need for Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP /IP Protocol Architecture.
Digital Data Communication Techniques: Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction.

UNIT-II	16 Periods

Data Link Control: Flow Control, Error Control.
Network Layer:
Network Layer Design Issues: Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual-Circuit & Datagram Subnets.
Routing Algorithms: The Optimality Principle, Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing.
Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control.

UNIT-III	16 Periods

Quality of Service: Requirements, Techniques for Achieving Good Quality of Service The
Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols.
The Transport Layer: The Transport Service: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley sockets
Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery.

UNIT-IV	14 Periods

The Internet Transport Protocol (UDP): Introduction to UDP, Remote Procedure Call, The

Real-Time Transport Protocol.

The Internet Transport Protocols (TCP): Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, TCP Timer Management.

Application Layer: The Domain Name System (DNS): The DNS Name Space, Resource Records, Name Servers.

Text Book(s) :	1. BehrouzA.Forouzan, ―Data Communications and Networking‖, 4th edition, TMH. 2. Tanenbaum, ―Computer Networks‖, 4th Edition, (Pearson Education / PHI).
References :	1. Wayne Tomasi, ―Introduction to Data Communications and Networking‖, PHI. 2. GodBole, ―Data Communications & Networking‖, TMH. 3. Nader F.Mir, ―Computer and Communication Networks‖, PHI

Institution Elective - II

WIRELESS COMMUNICATIONS

VIII – Semester (Code: 18ECI03)

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

Prerequisites: NONE

Course Objectives: In this course, students will learn the following topics

CO1: Understand basic fundamentals of wireless communications.

CO2: To know the role of equalization in Mobile communication and to study different
types ofEqualizers and Diversity techniques.

CO3: Differentiate various multiple access technique

CO4: Demonstrate different wireless communication systems and standards (1G to 4G)..

Course Outcomes: Students will be able to

CLO1: Understand the fundamental concepts of Cellular & Mobile communications

CLO2: Demonstrate knowledge equalization and different diversity techniques

CLO3: Compare different multiple access techniques in mobile communication.

CLO4: Demonstrate different wireless communication systems and standards (1G to 4G)

UNIT – I

Cellular Mobile Communication Concepts: Evolution of mobile radio communications, Examples of wireless communication systems, Frequency re-use and channel assignment strategies, Handoff strategies, Interference and system capacity, co-channel and adjacent channel interference,Grade of service,Coverage and capacity enhancement in cellular network, cell splitting, sectoring, repeaters, microcells.

UNIT – II

Equalization: Fundamentals of equalizers, Equalizers in a communication receiver, Linear equalizers, Nonlinear equalizers: Decision feedback equalizers, Maximumlikelihood sequence Estimation (MLSE) equalizer.

Diversity Techniques: Space diversity: Selection diversity, feedback, MRC, EGC diversity, Polarization diversity, Frequency diversity, Time diversity, Rake Receiver.

UNIT – III

Multiple Access in Wireless communications: Principle and applications ofMultiple Access Techniques-FDMA, TDMA, CDMA, Spread Spectrum Multiple Access.

UNIT – IV

Wireless Generations Technologies up to 3G:1G, TDMA-based 2G, IS-95, 2.5G, 3G development, Air interface technologies , Internet speeds of 2G, 2.5G, and 3G technologies, Limitations of 3G, Quality of services (QOS) in 3G.

4GTechnology:4G evolution,   Advantages of 4G over 3G, Applications of 4G, Limitations of 4G.

TEXT BOOKS:

1. Theodore S. Rappaport, Wireless Communications Principles and Practice, 2ndEdition, Pearson Education, 2003 (UNIT I, II, III).
2. G Sasibhusan Rao, Mobile Cellular Communications, Pearson Education, 2013(UNIT IV).

REFERENCE BOOKS:

1. W.C.Y. Lee, Mobile Cellular Communications, 2nd Edition, MC Graw Hill, 1995.
2. Yi-BingLin, ImrichChlamtac, Wireless and Mobile Network architectures, Wiley, 2001.
3. KamiloFeher, Wireless Digital Communications, PHI, 2003.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
ARTIFICIAL NEURAL NETWORKS
VIII – Semester (Code: 18ECI04)

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

Prerequisites: NONE

Course Objectives: In this course, students will learn the following topics

CO1: Certain fundamental concepts of artificial neural networks.

CO2: Basic elementary patterns classifying neural nets and the fundamental ideas of patter association.

CO3: Basic concepts of competitive networks and brief descriptions of certain competitive Networks.

CO4: Various applications of Neural networks in different domains.

Course Outcomes: Students will be able to

CLO1: Understanding the functionality of Artificial Neural Model and implementation of different digital logics using various neural models.

CLO2: Analyze the given pattern to one already stored in memory

CLO3: Understanding A multilayer feed forward neural net with one or more hidden layers can learn any continuous mapping to an arbitrary accuracy.

CLO4: Learn variousapplications of Neural networks.

SYLLABUS
UNIT – I
ARTIFICIAL NEURAL NETWORKS: **BASIC CONCEPTS**

Introduction, Computation in terms of patterns, The McCulloch-Pitts Neural Model, The Perceptron, Neural Network Architectures, Activation Functions, Learning by Neural Nets

UNIT – II
PATTERN CLASSIFIERS: Hebb Nets, Perceptrons, Adaline, Madaline.

PATERN ASSOCIATORS: Auto-associative Nets, Hetero-Associative Nets, Hopfield Networks, Bi-directional Associative Memory.

UNIT – III
COMPETITIVE NEURAL NETS: The MAXNET, Kohonen's Self Organizing Map (SOM), Learning Vector Quantization (LVQ), Adaptive Resonance Theory(ART)

BACKPROPAGATION: Multilayer Feed forward Net, The Generalized Delta Rule, The Back propagation Algorithm.

UNIT – IV
APPLICATIONS OF NEURAL NETWORKS

Applications of Neural Networks in Forecasting, Applications of Neural Networks in Healthcare, Applications of Neural Networks in Business, Applications of Neural Networks in image processing and compression, Applications of Neural Networks in control systems, Applications of Neural Networks in pattern recognition.

TEXT BOOKS

1. Introduction to SOFT COMPUTING by Samir Roy and UditChakraborty,Pearson Publishing,2013. (Unit I,II, III)
2. Introduction to Neural Networks using Matlab 6.0 by S N Sivanandam,SSumathi, S N Deepa,Tata McGraw Hill Publishing,7th Reprint, 2008(Unit IV)

REFERENCE BOOKS:

1. Jang J.S.R., Sun C.T., Mizutani E., "*Neuro-Fuzzy and Soft Computing*", Prentice Hall, 1997
2. Hertz J., "*Introduction to the Theory of Neural Computing*", Addison-Wesley, 1991

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
HIGH VOLTAGE ENGINEERING
IV B.Tech – VIII Semester (Code: 18EEI03)

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

Pre-requisites: Physics, Circuit Theory, Power Systems-1

Course objectives: To make the students

CO1: Understand the breakdown phenomenon in solids, liquids and gases.
CO2: Understand different measuring techniques in high voltages.
CO3: Understand the testing techniques of different high voltage apparatus.
CO4: To know the protective techniques against over voltages.

Course outcomes: At the end of the course, the student will demonstrate

CLO1: Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials.
CLO2: Explain the generation and measurement of D. C., A.C.,& Impulse voltages.
CLO3: Describe tests on H. V. equipment and on insulating materials, as per the standards.
CLO4: Illustrate the protection against over voltages.

UNIT-I

Breakdown phenomenon of Gases,Liquids and Solids: Ionization processes and de-ionization processes, Types of Discharge, Gases as insulating materials, Breakdown in Uniform gap, non-uniform gaps, Townsend's theory, Streamer mechanism, Corona discharge. Breakdown in pure and commercial liquids, Solid dielectrics and composite dielectrics, intrinsic breakdown, electromechanical breakdown and thermal breakdown, Partial discharge, applications of insulating materials.

UNIT-II

Generation of High voltages: Generation of high D. C. and A.C. voltages, generation of impulse voltages, generation of impulse currents, tripping and control of impulse generators.

UNIT-III

Measurement of high voltages and currents: Measurements of Peak voltage, impulse voltage and high direct current measurement method, cathode ray oscillographs for impulse voltage and current measurement, measurement of dielectric constant and loss factor, partial discharge measurements.Protection against over-voltages, Surge diverters, Surge modifiers.

UNIT-IV

High voltage testing techniques: Various standards for HV Testing of electrical apparatus, IS, IEC standards, Testing of insulators and bushings, testing of isolators and circuit breakers, testing of cables, power transformers and some high voltage equipment, High voltage laboratory layout, indoor and outdoor laboratories, testing facility requirements, safety precautions in H. V. Labs.

TEXTBOOKS:
1. M.S.Naidu and V.Kamaraju , "High Voltage Engineering", McGraw Hill; 6thedition, 2020.

2. C. L. Wadhwa, "High Voltage Engineering", New Age International Publishers, 2007.

REFERENCE BOOKS:

1. Kuffel and Zungel,"High Voltage Engineering fundamentals", ELSEVIER, 2nd edition, 2008.
2. R. Arora and W. Mosch "High Voltage and Electrical Insulation Engineering", John Wiley & Sons, 2011.
3. Wolfgang Hauschild, Eberhard Lemke, "HV Laboratory Techniques and Testing", Springer; 2nd ed. 2019.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
ELECTRICAL ENERGY CONSERVATION & AUDITING
IV-B.TechVIII-Semester (Code: 18EEI04)

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

Course objectives: To make the students
   CO1: Understand the concept of energy conservation, energy management.
   CO2: Explain the energy efficient motors and its characteristics.
   CO3: Understand the power factor improvement, lighting and different measuring instruments.
   CO4: Explain the economic aspects of energy management.
Course outcomes: At the end of this course, students will be able to
   CLO1: Examine the principles of Energy audit and its process in thermal power station&analyze the different aspects of energy management.
   CLO2: Describe the characteristics of energy efficient motors.
   CLO3: Illustrate the power factor improvement, good lighting system practice and the typesof energy instruments.
   CLO4: Analyze the economic aspects of Energy Management.

UNIT-I
Basic Principles of Energy Audit: Energy audit - definitions, concept , types of audit, energy index, cost index , pie charts, Sankey diagrams, load profiles, Energy conservation schemes - Energy saving potential, energy audit of thermal power station, building energy audit.

Energy Management: Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting, Energy manger, Qualities and functions, language, Questionnaire - check list for top management.

UNIT-II

Energy Efficient Motors: Energy efficient motors, factors affecting efficiency, loss distribution, constructional details. Characteristics - Variable speed, variable duty cycle systems, Voltage variation -Voltage unbalance - Over motoring - Motor energy audit.

UNIT-III
Power Factor Improvement, Lighting & Energy Instruments: Power Factor Improvement, Lighting: Power factor – Methods of improvement, location of capacitors, Pf with non-linearloads, effect of harmonics on power factor. Power factor motor controllers - Good lighting system design and practice, lighting control, lighting energy audit. Energy Instruments: Watt meter, data loggers, thermocouples, pyrometers, lux meters, tong testers, application of PLC's.

UNIT-IV
Economic Aspects and Analysis:**Economics Analysis - Depreciation Methods, time value of money, rate of return, present worth method , replacement analysis, life cycle costing analysis - Energy efficient motors, Calculation of simple payback method, net present worth method - Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.**

TEXT BOOKS:

1. Desai, Sonal, "Handbook of Energy Audit", McGraw-Hill Education, 2015.
2. W.R. Murphy and G. Mckay. EnergyManagement. Butter worth Publications.2001.
3. John. C. Andreas, Energy Efficient ElectricMotors, Marcel Dekker Inc Ltd, 2nd Edition, 1995.

REFERENCE BOOKS:

1. Bureau of Energy Efficiency India. General Aspects of Energy Management and Energy Audit. Bureau of Energy Efficiency India, 4 th edition, 2015.
2. Bureau of Energy Efficiency India. Energy Efficiency in Electrical Utilities. Bureau of Energy Efficiency India, 4 th edition, 2015.
3. Doty, Steve, and Wayne C. Turner. Energy management handbook. Crc Press, 2004.
4. Paul O' Callaghan, "Energy Management", Mc-Graw Hill Book Company, 1st Edition, 1998.
5. S. C. Tripathy, "Utilization of Electrical Energy", Tata McGraw Hill, 1993.

Institution Elective - II
ROBOTICS AND AUTOMATION (18EII03)

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

Course Objectiv

❖ To understand the basic anatomy of robots and trajectory planning
❖ To enable students to understand about the work envelopes of robots and its role in automation
❖ To give an overview of the various methods of control of robots
❖ To select robots based on their applications and their related issues in industrial automation

Course Outcomes :

CO1: Expertise in fundamentals of Robotics (Unit I)
CO2: Understand the issues related to end effectors and sensors (Unit II)
CO3: Acquire knowledge in Programming and control of Robots (Unit III)
CO4: Understand the issues related to implementation of Industrial Automation with Robot Applications

Syllabus :

UNIT–I

Fundamentals of Robots: Definition –Historical background- Robot Anatomy : Polar, Cylindrical, Cartesian coordinate, Joint-arm configuration–Work volume– Robot Drive System : Hydraulic, Electric, Pneumatic – Control System: Limited sequence, Play back with point to point and Continuous path control Intelligent Robots- Dynamic performance: Speed of response and Stability - Precision of movement: Spatial Resolution, Accuracy, Repeatability and Compliance – Introduction to End effectors, Robotic Sensors, Robot Programming and work cell control.

UNIT–II

Robot End Effectors, Sensors, End Effectors: Types-Mechanical grippers-Magnetic grippers, Vacuum cups, Adhesive gripper, Hooks and Scoops- Tools as end effectors - Robot/ End-effectors, interface- Consideration in Gripper selection and Design.
Sensors: Transducers and Sensors – Sensors in Robotics: Tactile, Proximity, and Range Sensors, Miscellaneous sensors and sensor based systems- Machine Vision System.

UNIT–III

Programming and Control of Robots :Robot Programming: Methods of Programming-: Lead through Methods, Robot program as a path in space- Motion interpolation, WAIT, SIGNAL and DELAY Commands, Branching, Capabilities and limitations of Lead through Methods-
Textual Robot Programming- structure, Motion, End effectors and Sensor commands, Program control communication, Monitor mode commands Robot Control: Open and Closed loop control- control Problem- Linear control Schemes- Design of Partitioned PD, PID and Adaptive Controllers for Linear Second order SISO Model of robot and their Block schematic representation- Control of Industrial

Robots Using PLCs.

UNIT–IV

Automation: Factory Automation: Fixed Automation, Flexible Automation and Programmable Automation. Intelligent Industrial Automation, Industrial Networking, Bus Standards Automatic Feeders, Automatic Storage and Retrieval Systems (AS/RS), Transfer Lines, Automatic Inspection Systems Applications of Robots, Factors influencing the selection of Robots – Robots for Welding, Painting, Assembly, Nuclear, Thermal and Chemical Plants.

Introduction to Mobile Robots, Legged Robots and Remote Controlled Robots, Automated Guided Robots, Micro Robots – Control and Safety Issues.

Text Books:

1. Groover, M.P., Weiss, M., Nagel, R.N., Odrey, N.G., Industrial Robots: Technology, Programming and Applications, McGraw-Hill Book Company, 2012.
2. Mittal R K, Nagrath I J, "Robotics and control", Tata McGraw Hill, 2010.

Reference Books:

1. Groover, M.P., Automation, Production Systems, and Computer-Integrated Manufacturing, Prentice-Hall of India Private Limited, New Delhi, 2007
2. S.R.Deb, "Robotics Technology and Flexible Automation", Tata McGraw Hill, 1994
3. YoranKoren, Robotics for Engineers, McGraw Hill, 1980.
4. Saeed B. Niku, An Introduction to Robotics- Analysis, Systems, Applications, Second Edition, John Wiley & Sons Inc., 2010.
5. Wesley, E. Sryda, "Industrial Robots: Computer interfacing and Control" PHI, 1985.

Institution Elective - II
SENSORS AND SIGNAL CONDITIONING (18EI104)

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

Course Objectives:
- ❖ Describe the basics of sensors, their static and dynamic characteristics, primary sensors for common quantities, working principles of resistive sensors and various methods of signal condition of resistive sensors.
- ❖ Study various reactive variation sensors and design of signal condition circuits for these sensors
- ❖ Know various self generating sensors and design of signal condition circuits for these sensors
- ❖ Understand the working principles of various digital and Intelligent sensors

Course Outcomes :
- **CO:1** List the characteristics of sensors and their significance
- **CO2:** State applications of resistive sensors and design a signal conditioning circuit for a given resistive sensor.
- **CO3:** State the working principles of self generating sensors, their applications design a signal conditioning circuit for a given self generating sensor
- **CO4:** List various digital sensors and their applications

Syllabus :

UNIT-I
Introduction to sensor-based measurement systems: General concepts and terminology, sensor classification, general input-output configuration, static and dynamic characteristics of measurement systems, primary sensors.
Resistive sensors : potentiometers, strain gauges, resistive temperature detectors, thermistors.
Signal conditioning for resistive sensors: Measurement of resistance, voltage dividers, Wheatstone bridge-balance measurements, Wheatstone bridge-deflection measurements, differential and instrumentation amplifiers, interference.

UNIT-II
Reactance variation and electromagnetic sensors: capacitive sensors, inductive sensors-variable reluctance sensors, eddy current sensors, linear variable differential transformer, electromagnetic sensors.
Signal conditioning for reactance variation sensors: problems and alternatives, ac bridges, carrier amplifiers and coherent detection, specific signal conditioning for capacitive sensors.

UNIT-III
Self generating Sensors: thermocouples, piezoelectric sensors, photovoltaic sensors, electrochemical sensors.
Signal conditioning for self-generating sensors: Chopper and low-drift amplifiers, electrometer and transimpedance amplifiers, charge amplifiers, noise in amplifiers, noise and drift in resistors.

UNIT-IV

Digital and Intelligent sensors: Position encoders, resonant sensors, variable oscillators, conversion to frequency, period or time duration, direct sensor-microcontroller interfacing, communication systems for sensors, intelligent sensors.

Text Books:

1. Raman Pallas – Areny, John G. Webster :Sensors and signal conditioning, second edition, John Wiley and sons.

Reference Books:

1. Walt Kester : Practical design techniques for sensor signal conditioning, Analog devices and Prentice Hall.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
MOBILE APPLICATION DEVELOPMENT
IV B.Tech – VIII Semester (18IT103)

Lectures	:	4 Periods/Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: Object Oriented Programming using Java

Course Objectives: Students will be able to:

COB 1: Understand basic concepts of Android platform.
COB 2: Learn Android UI palette.
COB 3: Familiarize with Building blocks of Android App.
COB 4: Understand working with Mobile hardware in Apps.
Course Outcomes: After the course the students are expected to be able to
CO 1: Apply Java programming concepts to Android App development.
CO 2: Develop User interfaces for Android Apps.
CO 3: Use the mobile sensors, google maps & multimedia in Apps.
CO 4: Develop a full featured Android Apps.
Syllabus:

UNIT – I   (14 Periods)

Introduction: Android background, Android SDK features, Android Software Stack, Android Development Tools, Types of Android applications, Hardware imposed design considerations, Practical application design considerations.
Creating Applications & Activities: Creating basic Android application using Android Studio, Exploring Android Studio IDE, Application Manifest file, Using the Manifest Editor, Using Resources.The Activity Life Cycle.
Building User Interfaces: Basic Views, Picker views, List views, View Groups, Android Layouts, Fragments - Fragment Life Cycle, working with Android fragments, using Adapters.

UNIT – II   (14 Periods)

Advanced Views: Image View, Grid View, Image Switcher, Working with Menus, Web View, Working with Dialogs – Alert Dialog, Progress Dialog, Date Picker Dialog, Time Picker Dialog, Character Picker Dialog.
Intents and Broadcast Receivers: Using Intents to launch Activities, Returning results from Activities, Using intents to broadcast events; Pending Intents, Intent filters & Broadcast Receivers - using Intent Filters to service Implicit Intents, Listening for Native Broadcast Intents.
Files, Saving State & Preferences: Working with the File System, Saving & Restoring Activity Instance state using Life cycle Handlers, Saving & Retrieving Shared Preferences.
Using Internet Resources: Downloading files using Download Manager.

UNIT – III   (14 Periods)

Databases: SQLite, Content Values & Cursors, Working with SQLite databases.
Content Providers: Creating Content Providers, Using Content Providers, Native Android Content Providers.
Messaging & Notifications: Sending SMS & MMS using Intents, sending SMS using SMS Manager, Receiving SMS Messages. Notifications - Creating Notifications, Using Standard Notification UI, Creating a Custom Notification UI, Triggering, Updating & Canceling Notifications.

Working in the Background: Creating and Controlling Services, Binding Services to Activities. Creating and Running Asynchronous Tasks, Manual Thread Creation.

UNIT – IV (14 Periods)

Hardware Sensors: Supported Android Sensors, Virtual Sensors, Monitoring Sensors, Interpreting Sensor values, using Accelerometer & Proximity sensors.

Maps & Location Based Services: Using the emulator with location based services, Finding and Tracking your location, using proximity alerts, using the Geocoder, map based activities.

Audio, Video and using the Camera: Playing Audio and Video, Recording Sound, Recording Video, using Camera.

TEXT BOOK:

1. **"Professional Android 4 Application Development",** Reto Meier, John Wiley & Sons, Inc., 2012.
2**. "Beginning Android Programming with Android Studio",** J. F. DiMarzio, 4th edition, John Wiley & Sons, Inc., 2017.

REFERENCE BOOKS:

1. **Head First Android Development -** A Brain Friendly Guide, Dawn Griffiths & David Griffiths, O' Reilly.
2. **Introduction to Android Application Development - Developer's Library,** Joseph Annuzzi, Jr.Lauren Darcey& Shane Conder, 5th ed., Addison-Wesley.

Institution Elective - II
WEB TECHNOLOGIES
IV B.Tech – VIII Semester (18IT104)

Lectures	:	4 Periods/Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: C Programming (18CS001)

Course Objectives: Students will be able to:

COB 1: Analyze a web page and identify HTML elements and their attributes.
COB 2: Build dynamic web pages using JavaScript (client side programming).
COB 3: Write a well formed / valid XML documents.
COB 4: Understand Web server and its working also working with Ajax for asynchronous communication.

Course Outcomes: After the course the students are expected to be able to:
CO 1: Design web pages with different elements and attributes.
CO 2: Build websites with dynamic functionality using java script.
CO 3: Identify the functionality of XML and create an XML document and display data from XML document.
CO 4: Recognize the use of web servers and know the functionality of web servers.

Syllabus:

UNIT – I   (14 Periods)
Introduction to HTML5 Part I, Introduction to HTML5 Part II, Cascading Style Sheets I, Cascading Style Sheets II, **JavaScript:** Introduction to Scripting, Control Statements I, Control Statements II, Functions, Arrays.

UNIT – II   (14 Periods)
JavaScript: Objects, Dynamic HTML: Document Object Model and Collections, Event Model, HTML5 Introduction to Canvas

UNIT – III   (14 Periods)
XML: Introduction, XML Basics, Structuring data, XML Namespaces, DTD, XSD, XSL Transformations.

UNIT – IV   (14 Periods)
Building Ajax-Enabled Web Applications, Web Servers (IIS and Apache), Working with JQuery
Programming Exercises for Unit - IV:

TEXT BOOK:
1. Harvey M. Deitel and Paul J. Deitel, "Internet & World Wide Web How to Program", 5/e, PHI.
2. Kogent Learning Solutions Inc.,HTML5 Black Book: "Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and Jquery".

REFERENCE BOOKS:

1. Jason Cranford Teague, "Visual Quick Start Guide CSS, DHTML & AJAX", 4e, Pearson Education.
2. Tom NerinoDoli smith, "JavaScript & AJAX for the web", Pearson Education 2007.
3. Joshua Elchorn, "Understanding AJAX", Prentice Hall 2006.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institution Elective - II
NON-CONVENTIONAL ENERGY SOURCES
18MEI 003
IVYearB.Tech. Eighth Semester

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

Course Objectives:

CO 1: To enable students to identify different sources of non conventional energy and innovative Technologies in harnessing energy from these sources.

CO 2: Understand the energy conversion from wind energy, geothermal energy, Biomass, biogas, fuel cells.

CO 3: Understand the advantages and limitations of different non conventional energy sources and identify a wide variety of applications for non conventional energy.

Course Outcomes: At the end of the course, the student will be able to

CO-1: Understand different methods of exploiting solar energy.

CO-2: Understand the principles and energy conversion from wind and geo thermal sources

CO-3: Gain knowledge in exploring the energy from ocean, tidal and bio-mass

CO-4: understand the techniques in power generation using Fuel cells, bio gas and MHD

UNIT-I

Various non-conventional energy resources- Introduction, availability, classification, relative merits and demerits

Solar Energy: Extra terrestrial solar radiation - terrestrial solar radiation –solar radiations on earth-measurement of solar radiations-solar constant-solar collectors-flat plate collectors-concentrating collectors-solar thermal conversion-solar thermal central receiver systems - photovoltaic energy conversion - solar cells- energy storage methods-applications of solar energy

UNIT-II

Wind energy: Availability of wind energy in India, site selection-Components of wind energy conversion systems-Classification of wind energy conversion systems-vertical axis and horizontal axis wind turbines-Performance characteristics-Betz criteria coefficient-applications of WECS-environmental aspects

Geo thermal Energy: Structure of earth's interior-geothermal sites-geothermal resources-Site selection for geothermal power plants-Principle of working-various types of geothermal power plants- applications

UNIT-III

Ocean thermal energy conversion (OTEC): Principle of ocean thermal energy conversion-Open cycle and closed cycle OTEC plants-Merits and demerits

Tidal Power: Tides and waves as sources of energy-fundamentals and use of tidal energy-limitations of tidal energy conversion system

Bio mass: Availability of biomass and its conversion techniques-bio mass gasification-bio mass resource development in India

UNIT-IV

Bio Gas: Bio gas production, aerobic and anaerobic bio conversion process-Properties of bio gas-classification of biogas plants-advantages and disadvantages-bio gas applications

Fuel Cells: Classification, Principle of working of various types of fuel cells, merits and demerits, future potential of fuel cells.

Magneto-Hydrodynamics (MHD): Principle of working of MHD Power plant, Classification, advantages and disadvantages.

TEXT BOOK:

1. H.P. Garg& Jai Prakash, Solar Energy: Fundamentals and Applications, Tata McGraw Hill,
 New Delhi
2. Non-Conventional Energy Sources by G.D.Rai, Khanna Publisher
3. B H Khan, "Non-Conventional Energy Resources", 2nd Edition, Tata McGraw Hill Education Pvt Ltd, 2011

REFERENCE BOOKS:

1. Power plant technology by EL-Wakil, McGraw-Hill.
2. Renewable Energy Sources by John Twidell& Toney Weir: E&F.N. Spon

Institution Elective - II
AUTOMOBILE ENGINEERING
18MEI 004
IVYear B.Tech. Eight Semester

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

Course Objectives:

To make the students to

1. Familiarize the fundamentals of Engine Components, Chassis and suspension system, braking and transmission system, and cooling and lubrication system.
2. Develop a strong base for understanding future developments like hybrid and electric vehicles in the automobile industry.

Course Outcomes: After successful completion of this course, student will be able to:
1. List different types of Vehicles and their applications
2. Define working of Automobile Engine cooling and lubrication system.
3. Describe functioning of Ignition system and its accessories.
4. Describe functioning of Transmission, Steering, Braking and Suspension system.
5. Understand the working and layout of Hybrid and electric vehicles and their components

UNIT-I

INTRODUCTION: Classification of vehicles – applications, valves, valve arrangements and operating Mechanisms, Piston - design basis, types, piston rings, firing order; Crankshafts, Flywheel, Air and Fuel Filters, Mufflers.   (8)

FUEL SUPPLY SYSTEMS: Fuel supply pumps, Mechanical and Electrical type Diaphragm pumps.   (3)

COOLING SYSTEMS: Need for cooling system, Air and water cooling, Thermal syphon cooling systems   (4)

UNIT-II

LUBRICATING SYSTEMS: Various lubricating systems for I.C. Engines.   (3)

ELECTRICAL SYSTEM: Ignition system, Spark plugs, Distributor, Electronic Ignition, Alternator, cut out, Current and voltage regulators, charging circuit, starting motors, lighting, instruments and accessories.   (9)

CHASSIS: Introduction, Construction, Requirements of Chassis.   (3)

UNIT-III

TRANSMISSION: Gear Box - Theory, Four speed and Five Speed Sliding Mesh, Constant mesh & synchromesh type, selector mechanism, automatic transmission, overdrive, propeller shaft, differential - principle of working.   (8)

SUSPENSION SYSTEMS: Need for suspension systems, springs, shock absorbers, axles – front and rear, different methods of floating rear axle, front axle and wheel alignment.   (7)

UNIT-IV

VEHICLE CONTROL: Steering mechanisms and power steering, types of brakes and brake actuation mechanisms (air and hydraulic).   (6)

ELECTRIC, HYBRID AND FUEL CELL VEHICLES: Layout of electric and hybrid vehicles – Advantages and drawbacks, System Components, Electronic control system,

Different configurations of electric and hybrid vehicles hybrid vehicles, Power split device, High energy and power density batteries – Basics of fuel cell vehicles.   (9)

TEXT BOOKS
1. Automobile Engineering   - G.B.S.Narang.
2. Automobile Engineering -R.B.Gupta
3. Automobile Engineering - Vol I & II - Kirpal Singh

REFERENCE BOOKS
1. Automotive Mechanics   - Joseph Heitner
2. Automobile Engineering -S.Srinivasan

Institution Elective - II

18PHI03	ADVANCED MATERIALS	Even sem	3-0-0	3credits

Course Objectives:

CO1	To acquire knowledge on synthesis and properties of nano and bio materials
CO2	To educate the student on characteristics and usage of composite and optical materials.
CO3	To possess the knowledge on properties and applications of superconducting materials.
CO4	To know the functionality of smart materials and their adoption in real time applications

Course Outcomes: **After the completion of course the student is able to**

CLO1	Understand the importance of nano-materials, their characteristics and applications.
CLO2	Identify, describe and evaluate the properties of fibre reinforcements, polymer materials and optical materials.
CLO3	Advance their knowledge in phenomenon of superconductivity and applications.
CLO4	Explain the strengths and weaknesses of a smart material and surface acoustic wave materials into the design of a product in various applications.

UNIT-I

Nano Materials: Origin of nano technology, Classification of nano materials, Physical, chemical, electrical, mechanical properties of nano materials. Preparation of nano materials by plasma arcing, physical vapour deposition, chemical vapour deposition (CVD), Sol-Gel, electro deposition, ball milling, carbon nano tubes(CNT).Synthesis, preparation of nanotubes, nano sensors, Quantum dots, nanowires,nano biology, nanomedidcines.

Biomaterials: Overview of biomaterials. Biomaterials, bioceramics, biopolymers, tissue grafts, soft tissue applications, cardiovascular implants, biomaterials in ophthalmology, orthopeadiac implants, dental materials.

UNIT-II

Composites: General characteristics of composites , composites classes, PMCs, MMCs, CMCs, CCCs, IMCs, hybrid composites, fibers and matrices, different types of fibers, whiskers, different matrices materials, polymers, metal, ceramic matrices, toughening mechanism, interfaces, blending and adhesion, composite modeling, finite element analysis and design.

Optical materials: Mechanisms of optical absorption in metals, semiconductors and insulators. Non-linear optical materials, optical modulators and optical fibers. Display devices and materials photo-emissive, photovoltaic cells, charge coupled devices (CCD), laser materials.

UNIT-III

Super conducting materials: Types of super conductors, an account of mechanism of superconductors, effects of magnetic field currents, thermal energy, energy gap, acoustic attenuation, penetration depth, BCS theory, DC and AC Josephson effects, high Tc superconductors, potential applications of superconductivity, electrical switching element, superconductor power transmission and transformers, magnetic mirror, bearings, superconductor motors, generators, SQUIDS etc.

UNIT-IV

Smart materials: An introduction, principles of smart materials, input – output decision ability, devices based on conductivity changes, devices based on changes in optical response, biological systems smart materials. Devices based on magnetization, artificial structures, surfaces, hetero structures, polycrystalline, amorphous, liquid crystalline materials.

Surface Acoustic Wave (SAW) Materials and Electrets: Delay lines, frequency filters, resonators, Pressure and temperature sensors, Sonar transducers. Comparison of electrets with permanent magnets, Preparation of electrets, Application of electrets.

Textbooks & References:

1. B.S. Murthy et al., Textbook of Nano science and Nanotechnology, Universities press, Springer.
2. Krishan K Chawla, Composite Materials;Springer; 3rd ed. 2012.
3. A.C. Rose-Innes and E.H. Rhoderick, *Introduction to Superconductivity*.2nd Edition 1978
4. Brian Culshaw, Smart structures and materials, Artech House Publishers

Institution Elective - II

18PHI04	OPTO ELECTRONIC DEVICES AND APPLICATIONS	Odd sem	3-0-0	3credits

Course objectives

CO1	Understand the concepts of different lasers and mode locking systems.
CO2	Gain the knowledge about light generating devices, solar cells and display devices.
CO3	To know the operating mechanism and applications of various light detecting devices.
CO4	To familiarize electro optic modulators relating to communication

Course Outcomes

CLO1	Develop the knowledge of laser operating principles and structures to produce giant optical pulses.
CLO2	To Acquire the detailed knowledge about functionality and applications of solar cells ,light generating and display devices
CLO3	To posses the skills of design ,develop and adoption of photo detectors in real time electronic applications.
CLO4	To have the knowledge on the usage of optical modulators in communication process.

UNIT-1

Optical process in semiconductors /optical media: Interaction of photons with matter , radiative non radiative processes , rates of absorption and emission –laser principle optical feedback-threshold condition-semiconductor laser –heterojunction lasers quantum well lasers, tunneling based lasers, mode locking: active mode locking and passive mode locking Q-switching

UNIT-2

Display devices: photo luminescence, cathode luminescence, electro luminescence, injection luminescence, LED principle of operation- LED structure –frequency response –defects and reliability, plasma display liquid crystal display, numerical display-photovoltaic effect- I-V characteristics and spectral response of solar cells –heterojunction and cascaded solar cells-Schottky barrier and thin film solar cells –design of solar cell.

UNIT-3

Detection devices: photo detection principle ,photo detector –thermal detector – photo conductor –noise in photo conductors –PIN photo diode –APD detector performance parameters –detectors for long wave length operation –wave length selective detection charge coupled device (CCD), application of infrared detector used for TV and remote controllers

UNIT-4

Communication –types of communication –examples –modulation-types of modulation – limitations of direct modulation – modulation by carrier injection in semiconductors – electro optic modulators – Kerr modulators Acousto- optic modulators (Bragg cell) , interferometric modulators semiconductor optical amplifiers .

Text Books:

1. Pallab Bhattacharya "Semiconductor opto electronic devices" , Prentice Hall of India Pvt. LTD, New Delhi 2009
2. Jasptit Singh, "Opto Electronics-An introduction to Materials and Devices" ,McGraw-Hill International Edition,2014.

3. S.C.Gupta,"Opto Electronic Devices and Systems", Prentice Hall of India,2015
4. J.Wilson and J.F.B.Hawes,"Optoelectronics-An Introduction", PearsonEducatiob, Taiwan Ltd,2010.

.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Institutional Elective-II
English for Competitive Examinations (18EL004)
IV B.Tech (Theory)

Lectures:3 Periods/Week   Continuous Assessment: 50M
Sem End Exam Duration: 3 hours   Sem End Exam   : 50M
Course Schedule: IV B.Tech-VIII Sem   **Credits: 3**

UNIT-I	L	P	T
	10	0	0

Orientation on different formats of competitive exams - Vocabulary – Verbal ability – Verbal reasoning - Exploring the world of words – High Frequency Words – Meaning and their usage – Synonyms-antonyms –Word substitution –Double Unit Analogies – Idioms and phrases – Commonly confused words – Spellings –Word variables – New words in use.

UNIT-II	L	P	T
	10	0	0

Grammar – Sentence improvement –Sentence completion – Rearranging phrases into sentences – Error identification –Tenses – Prepositions – Adjectives – Adverbs – Subjectverb agreement – Voice – Reported speech – Articles.

Unit III	L	P	T
	10	0	0

Listening and Speaking

Contextual listening – Listening to instructions – Listening for specific information – Identifying detail, main ideas – Following signpost words – Connected Speech with Intonation Patterns - Speaking to respond and elicit ideas – Guided speaking (Visual Description) – Opening phrases (Formal & Informal) –Speaking on a topic – making an interactive presentation – Telling a story or a personal anecdote – Talking about oneself - Utterance – Speech acts- Brainstorming ideas – Group discussion.

Unit IV	L	P	T
	12	0	0

Reading& Writing:

Reading: Specific information and detail – Identifying main and supporting ideas – Speed with accuracy – Improving global reading skills – Linking ideas – Summarising – Understanding argument – Identifying opinion/attitude and making inferences - Critical reading

Writing:Pre-writing techniques – Mind Mapping - Describing pictures and facts-Focus on cohesion – Using cohesive devices –organizing points – Rhetoric writing -Analytic writing-Statements of Purpose – Structure, Content and Style

Reference Books:
- ❖ Showick Thorpe, English for Competitive Examinations, Pearson Education, India:Fifth edition, 2015.
- ❖ Philip Sunil Solomon, English for Success in Competitive Exams, Oxford University Press
- ❖ Sharon Weiner Green, Barron's GRE, Galgotia Publications: Seventeenth Edition, 2008.

Course Description:

This course aims to prepare the Students for competitive examinations where the English language is a vital component. It is designed for students in the higher semesters, the course will help students to familiarise themselves with those aspects of English that are tested in these examinations.

Course Objectives:

The course aims
 ➢ To train the students in the language components essential to face competitive examinations both at national (UPSC, Banking, Railway, Defence) and international levels (GRE, TOEFL, IELTS).
 ➢ to enhance an awareness of the specific patterns in language testing and the respective skills
 ➢ Togear up with verbal reasoning and verbal ability tests.
 ➢ To inculcate effective practices in language-learning in order to improve accuracy in the usage of grammar and coherence in writing.

Course Outcomes:

Students will be able to
 ➢ develop and use vocabulary effectively and gain practical techniques
 ➢ utilize reading skills to comprehend a wide range of texts with the emphasis required
 ➢ apply principles of functional grammar to identify errors with precision and write with clarity and coherence
 ➢ develop improved competence in listening skills in order to follow and comprehend different accents and speak effectively