Vision of the Institution

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

Mission of the Institution

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

Vision of ECE Department

In pursuit of world class excellence in the field of Electronics& Communication Engineering by imparting quality education and promoting Research.

Mission of ECE Department

- To empower students with knowledge and competencies in the field of Electronics & Communication Engineering conforming to International standards.
- To produce creative solutions essential to local and global needs in the field of Electronics & Communication Engineering.
- To mould the students professionally with a consciousness of moral values and professional ethical code**.**

Program Educational Objectives (PEOs) of ECE Department

PEO1: To provide world class Education in the principles of engineering that incorporate open ended design experience and the use of software and hardware tools related to Electronics and Communication Engineering and hence improve the employability skills of the student.

PEO2: To make the students able to function with multi-disciplinary teams that will enhance the leadership qualities and to formulate and solve engineering problems as a team which helps the student to adopt better professional conduct.

PEO3: To provide learning environment that provides open interaction for the students with faculty and staff that makes them innovative and dynamic and encourages research and motivate them to solve the problems of the society.

Program Outcomes (POs) of ECE Department

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) of ECE Department

1. Will be equipped with knowledge of innovative, dynamic complete design flow specialized in implementation of projects pertaining to communication system, signal processing, digital and analog IC design, embedded systems and will integrate all areas to illustrate the goal of digital India.
2. Will have the ability to analyze, design electronics and communication applications using software tools like, pSpice, XYLINX, MATLAB, Mentor Graphics and other related software's.
3. Can demonstrate the principles of semiconductor devices, digital system, Microprocessor and microcontrollers, signal processing, antenna design in fields of consumer electronics, medical, defence and spacecraft electronics industry.
4. Will have strong ethical moral values and sound fundamental foundation of technical knowledge in all core subjects which help them to explore scientific theories, ideas, methods and technologies that help in solving current and future universal societal problems through Assistive Technology Laboratory as a flat form.

II YEAR I SEMESTER									
S. No	**Subject Code**	**Subjects**	**L**	**T**	**P**	**C**	**I**	**E**	**Cat**
1.	19EC3T01	Electronic Devices and Circuits	3	0	0	3	40	60	PC
2.	19EC3T02	Signals and Systems	2	2	0	3	40	60	ES
3.	19EC3T03	Switching Theory and Logic Design	3	0	0	3	40	60	ES
4.	19EC3T04	Random Variables and Stochastic Process	2	0	0	2	40	60	BS
5.	19EE3T04	Electrical Technology	3	0	0	3	40	60	ES
6.	19CS3T03	Internet of Things	2	0	0	2	40	60	ES
7.	19EC3P01	Lab I: Electronic Devices and Circuits Lab	0	0	3	1.5	40	60	PC
8.	19EE3P02	Lab II: Network Analysis & Electrical Technology	0	0	3	1.5	40	60	ES
9.	19CS3P01	Lab III: IoT Lab	0	0	3	1.5	40	60	ES
10.	19BS3P01	Lab IV: Business English Communication Skills Lab	0	0	3	1.5	40	60	ES
11.	19BS3I01	Quantitative Aptitude -I	0	0	2	0	0	0	ES
			15	3	13	22	400	600	1000

Course Name	**ELECTRONIC DEVICES AND CIRCUITS**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	3	0	0	3

Objectives:

The main objectives of this course are:

- The basic concepts of semiconductor physics are to be reviewed.
- Study the physical phenomena such as conduction, transport mechanism and electrical characteristics of different diodes.
- The application of diodes as rectifiers with their operation and characteristics with and without filters are discussed.
- The principal of working and operation of Bipolar Junction Transistor and Field Effect Transistor and their characteristics are explained.
- The need of transistor biasing and its significance is explained. The quiescent point or operating point is explained.
- Small signal equivalent circuit analysis of BJT and FET transistor amplifiers in different configuration is explained.

Syllabus:

UNIT-I: SemiConductor Physics : Classification of solids using energy banddiagrams,Generation of charge carriers in intrinsic semi conductors and extrinsic semi conductors,mobility and conductivity ,drift and diffusion, charge densities in semiconductors, Fermi Dirac function, Fermi level in intrinsic and extrinsic Semiconductors,continuity equation Hall effect.

UNIT- II: Junction Diode Characteristics : Open circuited p-n junction, law of junction,current components in PN junction Diode, diode equation, V-I Characteristics, temperature dependence on V-I characteristics, Diode resistance, Diode capacitance, energy band diagram of PN junction Diode.

Special Semiconductor Diodes: Zener Diode, Breakdown mechanisms, LED, Photodiode, Tunnel Diode,UJT. Construction, operation and characteristics of all the diodes are required to be considered.

UNIT- III: Rectifiers and Filters: Basic Rectifier setup**,** half wave rectifier, full wave rectifier, bridge rectifier,derivations of characteristics of rectifiers, rectifier circuits-operation, input and output waveforms, Filters, Inductor filter, Capacitor filter, comparison of various filter circuits in terms of ripple factors.

UNIT- IV: Transistor Characteristics:

BJT: Introduction to transistor, Operating modes of transistor, transistor current components, transistor configurations, transistor asan amplifier, characteristics of transistor in Common Base, Common Emitter and Common Collector configurations, punch through/ reach through, typical transistor junction voltage values.

FET: FET types, construction, operation, characteristics, parameters, MOSFET-types, construction, operation,characteristics, comparison between JFET and MOSFET.

UNIT- V: Transistor Biasing and Thermal Stabilization : Need for biasing and operating point, load line analysis,Stability factors, (S, S', S''), BJT biasing methods, fixed bias, collector to base bias, self bias, Stabilization against variations in V_{BE}, Ic, and β, Thermal runaway avoid condition. FET Biasing- methods and stabilization.

UNIT- VI: Small Signal Low Frequency Transistor Amplifier Models:

BJT: Two port network, Transistor hybrid model, determination of h-parameters, conversion of h-parameters,generalized analysis of transistor amplifier model using h-parameters, Analysis of CB, CE and CC amplifiers using exact and approximate analysis, Comparison of transistor amplifiers.

FET: Generalized analysis of small signal model, Analysis of CG, CS and CD amplifiers, comparison of FETamplifiers.

Text Books:

1. Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition.
2. Integrated Electronics- Jacob Millman, C. Halkies, C.D.Parikh, Tata Mc-Graw Hill, 2009.

References:

1. Electronic Devices and Circuits-Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, Second Edition
2. Electronic Devices and Circuits – A.P.Godse, U.A.Bakshi, Technical publications.

Outcomes:

At the end of this course the student can able to:

- Understand the basic concepts of semiconductor physics.
- Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
- Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
- Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.
- Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions.
- Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations.

Course Name	**SIGNALS & SYSTEMS**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	2	2	0	3

OBJECTIVES:

The main objectives of this course are given below:

- To introduce the terminology of signals and systems.
- To introduce Fourier series and Fourier Transform through signal analysis.
- To analyze the linear systems in time and frequency domains.
- To introduce Laplace transform as mathematical tool to analyze continuous-time signals and systems.
- To introduce Sampling theorem and to study z-transform to analyze discrete-time signals and systems.

UNIT- I: INTRODUCTION: Definition of Signals and Systems, Classification of Signals, Operations on signals: time-shifting, time-scaling, amplitude-shifting, amplitude-scaling, Complex exponential and sinusoidal signals, Singularity functions: unit impulse and unit doublet functions, properties, step function, signum function and ramp function. Classification of Systems, Causality and Stability Conditions, Problems on classification of Signals and Systems.

UNIT –II: SIGNAL ANALYSIS AND FOURIER SERIES: Analogy between vectors and signals, orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, closed or complete set of orthogonal functions, Orthogonality in complex functions, Gibb's Phenomenon.
Fourier series representation of continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum. Fourier transform of arbitrary signal,

UNIT –III: FOURIER TRANSFORM: Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT-IV: ANALYSIS OF LINEAR SYSTEMS: Linear time invariant (LTI) system, impulse response, Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF,BPF and BSF characteristics.

UNIT –V: LAPLACE TRANSFORM: Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's, Relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT –VI: SAMPLING AND Z–TRANSFORM: Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling. Related Problems.
Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and

Z-transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, properties of Z-transforms, Inverse Z-transform.

TEXT BOOKS:

1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.
3. Signals and Systems- I. Ravi Kumar, PHI,2009

REFERENCE BOOKS:

1. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2nd Edition.
2. Principles of Linear Systems and Signals – BP Lathi, Oxford University Press, 2015
3. Signals and Systems – K Raja Rajeswari, B VisweswaraRao, PHI, 2009
4. Fundamentals of Signals and Systems- Michel J. Robert, MGH International Edition, 2008.
5. Signals and Systems – T K Rawat , Oxford University press, 2011

OUTCOMES:

At the end of this course the student will able to:

- Understand and differentiate among various classes of signals and Systems
- Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
- Understand the relationships among the various representations of LTI systems
- Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
- Apply z-transform to analyze discrete-time signals and systems.

Course Name	**SWITCHING THOERY AND LOGIC DESIGN**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	3	0	0	3

COURSE OBJECTIVES:

- To solve a typical number base conversion and analyze new error coding techniques.
- Theorems and functions of Boolean algebra and behavior of logic gates.
- To optimize logic gates for digital circuits using various techniques.
- Boolean function simplification using Karnaugh maps and Quine-Mc Cluskey methods.
- To understand concepts of combinational circuits.
- To develop advanced sequential circuits.

UNIT I

Review of Number systems: Representation of numbers of different radix, conversion of numbers from one radix to another radix, r-1's complement and r's complement of unsigned numbers subtraction, problem solving. Signed binary numbers, different forms, problem solving for subtraction. 4-bit codes: BCD, EXCESS 3, 2421, etc.,

UNIT II

Logic operation: Basic logic operations NOT, OR, AND, Boolean theorems, Complement and dual of logical expressions, NAND and NOR Gates, EX-OR, EX-NOR Gates, standard SOP and POS, Minimization of logic functions using theorems, Generation of self dual functions. Gray code, multi leveled AND-NOR Realizations.

UNIT III

Minimization of switching functions: Minimization of switching functions using K-Map up to 5-variables, Tabular minimization, minimal SOP and POS Realization. Problem solving using K-map such as code converters binary multiplier etc.,

UNIT IV

Combinational logic circuits: Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary adder, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit Excess3 adder circuit, look-a-head adder circuit. Design of decoder, Demultiplexer, higher order demultiplexing, encoder, multiplexer, higher order multiplexer, realization of Boolean functions using decoders and multiplexers, priority encoder.

UNIT V

Flip-Flops and Registers: Classification of sequential circuits (synchronous and asynchronous): basic flip-flops, truth tables and excitation tables. Conversion of flip-flop to

flip-flop. Registers: Serial in/ serial out, Serial in/ parallel out, Parallel in/ parallel out, Parallel in/ serial out shift registers, Bidirectional shift register, Universal shift register.

UNIT VI

Counters and State Machines:

Ring counter & Johnson counter, Asynchronous counter operations, Synchronous counter operations, Up/ down counter, Introduction to FSM - Mealy and Moore models, Examples.

TEXT BOOKS:

1. Switching Theory and Logic Design by Hill and Peterson Mc-Graw Hill TMH edition.
2. Switching Theory and Logic Design by A. Anand Kumar
3. Digital Design by Mano PHI.

REFERENCE BOOKS:

1. Modern Digital Electronics by RP Jain, TMH
2. Fundamentals of Logic Design by Charles H. Roth Jr, Jaico Publishers
3. Micro electronics by Milliman MH edition.

COURSE OUTCOMES:

- Classify different number systems and apply to generate various codes.
- Use the concept of Boolean algebra in minimization of switching functions
- Design different types of combinational logic circuits.
- Apply knowledge of flip-flops in designing of Registers and counters
- The operation and design methodology for synchronous sequential circuits and algorithmic state machines.
- Produce innovative designs by modifying the traditional design techniques.

Course Name	**Random Variables and Stochastic Process**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	2	0	0	2

OBJECTIVES:

- To give students an introduction to elementary probability theory, in preparation for courses on statistical analysis, random variables and stochastic processes.
- To mathematically model the random phenomena with the help of probability theory concepts.
- To introduce the important concepts of random variables and stochastic processes.
- To analyze the LTI systems with stationary random process as input.
- To introduce the types of noise and modelling noise sources.

UNIT I

THE RANDOM VARIABLE : Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variables, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Conditional Density, Properties.

UNIT II

OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS : Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance, Characteristic Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Nonmonotonic Transformations of Continuous Random Variable.

UNIT III

MULTIPLE RANDOM VARIABLES : Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density, Statistical Independence, Sum of Two Random Variables.

OPERATIONS ON MULTIPLE RANDOM VARIABLES: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variables case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

UNIT IV

RANDOM PROCESSES – TEMPORAL CHARACTERISTICS: The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second-order and Wide-Sense Stationarity, N^{th}-order and Strict-Sense Stationarity, Time Averages and Ergodicity, Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

UNIT V

RANDOM PROCESSES – SPECTRAL CHARACTERISTICS: The Power Density Spectrum: Properties, Relationship between Power Density Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Density Spectrum and Cross-Correlation Function.

UNIT VI

LINEAR SYSTEMS WITH RANDOM INPUTS : Random Signal Response of Linear Systems: System Response – Convolution, Mean and Mean-squared Value of System Response, Autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectra of Input and Output, Band pass, Band-Limited and Narrowband Processes.

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles, Peyton Z. Peebles, TMH, 4th Edition, 2001.

2. Probability, Random Variables and Stochastic Processes, Athanasios Papoulis and S.Unnikrisha, PHI, 4th Edition, 2002.

REFERENCE BOOKS:

1.Probability Theory and Stochastic Processes – B. Prabhakara Rao, BS Publications

2. Probability and Random Processes with Applications to Signal Processing, Henry Stark and
John W. Woods, Pearson Education, 3rd Edition.

Schaum's Outline of Probability, Random Variables, and Random Processes.

3. An Introduction to Random Signals and Communication Theory, B.P. Lathi, International Textbook, 1968.

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OUTCOMES:

After completion of the course, the student will be able to

- ✓ Mathematically model the random phenomena and solve simple probabilistic problems.
- ✓ Identify different types of random variables and compute statistical averages of these random variables.
- ✓ Characterize the random processes in the time and frequency domains.
- ✓ Analyze the LTI systems with random inputs.
- ✓ Apply these techniques to analyze the systems in the presence of different types

Course Name	**Electrical Technology**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	3	0	0	3

Learning Objectives:

- To estimate parameters of two port networks
- To determine efficiency of dc shunt machine with actual loading.
- To analyze performance of 3 phase induction motor
- To investigate the performance of Single-phase transformer.
- To understand the significance of regulation of an alternators through synchronous impedance method.

UNIT-I

Two Port Networks: Open circuit impedance parameters, Short circuit admittance parameters, Transmission parameters, Inverse transmission parameters, Hybrid parameters, Inverse hybrid parameters, Inter connection of two port networks, T-Network, π network.

UNIT – II

Transients: Definition of time constants, R-L circuit, R-C circuit with DC excitation, Evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogenous, problem solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots. Solutions using Laplace transform method.

UNIT - III

DC Machines: Principle and operation of DC Generator EMF equations OCC characteristics of DC generator principle and operation of DC Motor Performance Characteristics of DC Motor Applications , speed control methods, three point starter.

UNITI- IV

AC Machines - I Principle and operation of Single Phase Transformer EMF equation OC and SC test on transformer regulation, losses and efficiency.

UNIT - V

AC Machines - II: Principle of operation of alternators, regulation by synchronous impedance method, principle of operation of 3-Phase induction motor, slip-torque characteristics, efficiency and applications.

UNIT-VI

Special Machines: Principle of operation AC & DC Servo motors, Stepper motors, Switched Reluctance Motors, Permanent magnet brushless DC Motors and Applications.

Learning Outcomes:

- Able to estimate the parameters of two port networks
- Able to describe the performance of dc shunt machine.
- Able to investigate the performance of Single-phase transformer.
- Able to perform tests on 3-phase induction motor and alternator to determine their performance characteristic

TEXT BOOKS:

T1. A Sudhakar and Shyam Mohan, "Network Analysis", 3rd Edition, TMH Edition, 2015.

T2. A Textbook of Electrical Technology: Volume 2 AC and DC Machines: -by B L Theraja ,

AK Theraja

T3.Theory & Performance of Electrical Machines by J.B.Gupta. S.K. Kataria & Sons;

REFERENCES:

R1. Basic Electrical Engineering by VK Mehta, Rohit Mehta

R2. Willam H. Hayt Jr., and Jack E. Kemmerly, "Engineering Circuit Analysis", 5 th Edition, Mc Graw-Hill, 1993.

Course Name	**INTERNET OF THINGS (IOT)**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	2	0	0	2

Course Objectives:

- To introduce the terminology, technology and itsapplications
- To introduce the concept of M2M (machine to machine) with necessaryprotocols
- To introduce the Python Scripting Language which is used in many IOTdevices
- To introduce the Raspberry PI platform, that is widely used in IOTapplications
- To introduce the implementation of web-based services on IOTdevices.

Course Outcomes:

- Interpret the impact and challenges posed by IOT networks leading to new architecturalmodels.
- Compare and contrast the deployment of smart objects and the technologies to connect them tonetwork.
- Appraise the role of IOT protocols for efficient networkcommunication.
- Elaborate the need for Data Analytics and Security inIOT.
- Illustrate different sensor technologies for sensing real world entities and identify the applications of IOTinIndustry.

UNIT –I INTRODUCTION

Introduction to Internet of Things –Definition and Characteristics of IOT, Physical Design of IOT – IOT Protocols,IOT communication models, IOT Communication APIs, Networking basics, Machine-to-Machine Communications

IOT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols,

UNIT – II IOT SYSTEM MANAGEMENT

Software defined networks (SDN), network function virtualization, difference between SDN and NFV for IOT. Basics of IOT System Management with NETCOZF, YANG- NETCONF, YANG, SNMPNETOPEER

M2M to IOT, Definition and differing characteristics, M2M Value Chains, IOT Value Chains, An emerging industrialstructure for IOT.

UNIT III IOTArchitectural and Wireless Technologies for IOT

Building architecture, design principles and needed capabilities, IOT architecture outline, standards considerations. Reference Architecture and ReferenceModel, Wireless Technologies for IOT:Protocol Standardization for IOT, M2M,RFID & NFC protocols.

UNIT IV IOT Physical Devices

Introduction to different IOT tools, IOT Physical Devices and Endpoints, Introduction to Raspberry PI, Interfaces (serial, SPI, I2C)

Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT –V DOMAIN SPECIFIC APPLICTION

Home Automation,Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Lifestyle, Embedded Systems, IOT Levels and Templates

UNIT – VI Cloud Analytics

Introduction to cloud computing, Role of Cloud Computing in IOT,Cloud-to-Device Connectivity. IOT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Webserver – Web server for IOT, Cloud for IOT, Python web application framework. Designing a RESTful web API

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN:9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN:9789350239759

REFERENCE BOOKS

1. 1.Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1stEdition, Academic Press,2014.
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications,2013
3. Cuno Pfister, Getting Started with the Internet of Things, O"Reilly Media, 2011, ISBN: 978-1-4493-9357-1.

Course Name	**ELECTRONIC DEVICES AND CIRCUITS LAB**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	0	0	3	1.5

Electronic Workshop Practice:

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Bread Boards.
2. Identification, Specifications and Testing of active devices, Diodes, BJTs, JEETs, LEDs, LCDs, SCR, UST.
3. Study and operation of Ammeters, Voltmeters, Transformers, Analog and Digital Multimeter, Function Generator, Regulated Power Supply and CRO.

List of Experiments: (Minimum of Ten Experiments has to be performed)

1. P-N Junction Diode Characteristics Part A: Germanium Diode (Forward bias& Reverse bias) Part B: Silicon Diode (Forward Bias only)
2. Zener Diode Characteristics Part A: V-I Characteristics Part B: Zener Diode as Voltage Regulator
3. Half-wave Rectifier(without and with c-filter)
4. Full-wave Rectifier(without and with c-filter)
5. BJT Characteristics(CB Configuration) Part A: Input Characteristics Part B: Output Characteristics
6. BJT Characteristics(CE Configuration) Part A: Input Characteristics Part B: Output Characteristics
7. FET Characteristics(CS Configuration) Part A: Drain Characteristics Part B: Transfer Characteristics
8. UJT Characteristics
9. Transistor Biasing
10. BJT-CE Amplifier
11. Emitter Follower-CC Amplifier
12. FET-CS Amplifier

Equipment Required:

Regulated Power supplies

Analog/Digital Storage Oscilloscopes

Analog/Digital Function Generators

Digital Multimeters

Decade Résistance Boxes/Rheostats Decade Capacitance Boxes
Ammeters (Analog or Digital)
Voltmeters (Analog or Digital)
Active & Passive Electronic Components.

Course Name	**NETWORKS ANALYSIS & ELECTRICAL TECHNOLOGY LAB**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	0	0	3	1.5

Learning Objectives:

- To determine resonance frequency, Q-factor of RLC networks.
- To estimate parameters of two port networks
- To understand the concept network theorems in network reduction of electrical networks.
- To determine efficiency of dc shunt machine with actual loading.
- To analyze performance of 3 phase induction motor
- To understand the significance of regulation of an alternators through synchronous impedance method.

PART – A

Any five experiments are to be conducted from each part

1. Verification of Thevenin's and Norton's theorems
2. Verification of Superposition theorem
3. Verification of Reciprocity theorems
4. Verification of Maximum power transfer theorem(DC)
5. Verification Milliman's Theorem
6. Series and Parallel Resonance Circuits
7. Z and Y parameters of two port Network

PART – B

1. Determination of critical field resistance of D.C. Shunt generator by using Magnetization characteristics
2. Speed control of D.C. Shunt motor by Armature & flux control methods
3. Determination of performance characteristics by conducting Brake test on DC shunt motor.
4. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
5. Brake test on 3-phase Induction motor (performance characteristics).
6. Regulation of alternator by synchronous impedance method

Learning Outcomes:

- Able to analyze RLC resonance circuits and understand resonant frequency and Q-factor.
- Able to estimate the parameters of two port networks
- Able to apply network theorems to analyze the electrical network.
- Able to describe the performance of dc shunt machine.
- Able to investigate the performance of Single-phase transformer.

Able to perform tests on 3-phase induction motor and alternator to determine their performance characteristic.

Course Name	**INTERNET OF THINGS (IOT) LAB**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	0	0	3	1.5

Following are some of the programs that a student should be able to write and test on an Raspberry Pi, but not limited to this only.

Part A: All are compulsary

1. Start Raspberry Pi and try various Linix commands in command terminal window: ls, cd, touch, mv, rm, man, mkdir, rmdir, tar, gzip, cat, more, less, ps, sudo, cron, chown, chgrp, ping etc.
2. Study of Digital IO configuration
3. Study of different type of Sensors (IR Sensor, LDR, Ultrasonic sensors, Temperature, Humidity, Light Intensity).
4. Demonstration of peer to peer communication between coordinator and end device through Router.

Part B – 06 Experiments need to be conducted

1. Get input from two switches and switch on the corresponding LEDs.
2. Flash an LED at a given on time and off time cycle, where the two times are taken froma file.
3. Flash an LED based on cron output (acts as an alarm) with and without using Rasberry Pi.
4. Switch on a relay at a given time using cron, where the relay's contact terminals are connected to a load.
5. Get the status of a bulb at a remote place (on the LAN) through web.
6. Controlling LEDs blinking pattern through UART.
7. Timer based LED Toggle.
8. Designing of power supply circuit in simulation.
9. Reading Temperature and Relative Humidity value from the sensor.
10. Reading Light intensity value from light sensor.
11. Echo each character typed on serial terminal.

Course Name	**BUSINESS ENGLISH COMMUNICATION LAB**				
Year/Semester	II B. Tech/ I Sem	L	T	P	C
Regulation Year	2020-2021	0	0	3	1.5

COURSE OBJECTIVES:

- To expose student to different situations for better communication
- To inculcate the habit of learning vocabulary for effective communication
- To enable students to acquire Business English communication

UNIT I: (2 sessions)

Listening: Listening to short conversations or monologues

Speaking: Giving information about oneself and their opinions and Giving a short talk on business related topics

Reading: Reading short and simple texts to understand the central idea/theme.

Writing: Writing a piece of internal business communication of 30-40 words (Email)

UNIT II: (2 sessions)

Listening: Listening to a conversation/ monologue and taking notes

Speaking: Giving short talk on business related topics.

Reading: Matching descriptions of people to short texts. Matching statements toinformation given in a graph or graphs.

Writing: Writing a piece of internal business communication of 30-40 words (Message)

UNIT III (2 sessions)

Listening: Listening to longer conversations/interviews.

Speaking: Debates & Extempore

Reading: Reading a longer text and deciding whether the statements about the text are right or wrong or if the information is not given.

Writing: Write a business letter 60-80 words, based on an input text and some notes.

UNIT IV (2 sessions)

Listening: Listening to TV news channels and taking notes.

Listening to songs and writing down the lyrics.

Speaking: Interview sessions

Reading: Read a longer text andanswering questions. .

Writing: Writing a Business Report

UNIT V: (2 sessions)

Listening: Watching short documentaries and making notes.(General)

Speaking: Short plays, Presentations.

Reading: Read short texts and fill in a form using information from the texts.

Writing: Write a skit and enact.

UNIT VI:(2 sessions)

Listening: Watching documentaries and making notes.(Business specific)

Speaking: Nail your point.

Reading: Critical Reading to know author's perspective.

Writing: Write a skit and enact.

REFERENCE BOOKS:

1. Cambridge English – Business English Certificate Preliminary
2. Suresh Kumar. E. &Sreehari P.A (2007), Handbook for English Language Laboratories,Cambridge University Press India Pvt. Ltd, New Delhi.
3. MandalS.K(2006), EffectiveCommunication&PublicSpeaking,JaicoPublishingHouse,New Delhi.
4. Grant Taylor (2004), English Conversation Practice, Tata McGraw Hill, New Delhi.
5. Balasubramanian.T(2000),AtextbookofEnglishPhoneticsforIndianStudent,MacMillan Publishers, India.
6. KamaleshSadanand,SusheelaPunitha(2008),SpokenEnglish:AfoundationCourse:Parts1& 2, New Delhi, Orient Longman Pvt. Ltd

WEB REFERENCES:

1. www.cambridgeenglish.org.
2. www.esl-lab.com

ADDITIONAL SOURCES:

1. A Planning Checklist for Business Messages https://open.lib.umn.edu/businesscommunication/chapter/5-2-a-planning-checklist-for-business-messages/
2. How to Improve Business Writing https://www.writing-skills.com/how-to-improve-your-business-writing
3. Self Compassion (Source - YouTube)
4. Bailey Finishes Marathon (Source - YouTube)
5. How to Conquer Public Speaking Fear (Source - Wordpress)
6. I am Sorry, I am so Nervous- RakeshGodhwani (Source - LinedIn)
7. Interpersonal Communication in the Future World (Source: YouTube)
8. The Power of Introverts (Source: YouTube)

9. Boost Power Through Body Language (Source: YouTube)
10. Take Control of your Non-Verbal Communication (Source: YouTube)
11. How to have a Good Conversation (Source: YouTube)

Course Name	**Quantitative Aptitude-I**				
Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-2021	2	0	0	0

Course Objectives:

Enable the students to

1. Understand different number systems, factorization, divisibility and concept of LCM and HCF.
2. Find averages, relation between ratio and proportion, average price of mixture of different quantities and relation between fraction and percentage.
3. Know the concepts of CP,SP, MRP, profit or loss incurred in a transaction.
4. Know the concepts of principal, interest, difference between SI and CI, EMIs.
5. Understand the relation between speed, distance and time for trains and boats in a river.
6. Understand the relation between time and efficiency, combined work and wages paid for the work.

Syllabus

UNIT –I: Number Systems

Basic number systems –Face and Place Value, Digital sum-Applications, Factors, Multipliers, Prime, & Composite Numbers, Divisibility Rules, LCM and HCF-Remainder Rules.

UNIT- II: Averages, Ratio& Proportion

Average-Weighted average, Ratio-Concept and properties, Proportions-Mean ,Third and Fourth proportions, Mixtures & Allegations-Definition-Allegation Rule, Percentages-Conversion of Percentages to Fractions and Vice-Versa.

UNIT –III: Profit& Loss

Cost Price- Selling Price- Marked Price, Discount- Successive Discounts, Profit or Loss Percentage, False Weights- Dishonest Dealer.

UNIT –IV: Simple & Compound Interest

Principal-Interest Rate-Tenure, Simple Interest-Formula-Sum, Compound Interest-Formula-Relation Between Simple & Compound Interest, loan-EMI, Investments-Shares.

UNIT – V:Time & Distance

Time-Distance-Speed-Relation, Conversion of Speed , Average Speed, Trains-Relative Speed-Same and Opposite –Platform, Races, Boats-Streams-Upstream and Downstream.

UNIT –VI: Time & Work

Work-Time-Efficiency, Combined Work-Partnership-Division of Wages, Chain Rule, Pipes and Cisterns-Inlet-Outlet.

Text Books:

1. Dr. R.S. Aggarwal , Quantitative Aptitude for competitive Examinations, Sultan Chand Publications, 2017.

References:

1. Arun Sharma, How to Prepare for Quantitative Aptitude for the CAT, Tata McGraw Hill Publishing Company, 2016.
2. Dinesh Khattar, The Pearson Guide to Quantitative Aptitude for Competitive Examinations, Pearson India, 2016

Course Outcomes:

After completing this course, the students will be able to

1. Find number of factors, LCM and HCF of numbers and fractions, least and greatest number divisible by given numbers and leaving some remainder(s).
2. Evaluate average of numbers, Proportions of given ratio, ratio or average price of two quantities of different prices when mixed to get new mix, use relation between fractions and percentages in calculation.
3. Identify the profit or loss incurred in a transaction and how cheating is possible by an unfair trader.
4. Calculate the simple and compound interests ,difference between them and the EMI repayment for a loan.
5. Evaluate the time taken by a train/car for crossing a static object or a moving object and time taken by a person to a row a boat in a river.
6. Calculate the time required for individual or combined work, shares of amount for their work and time taken for a tank/cistern to get filled by inlets and outlet.