BACHELOR OF TECHNOLOGY
ELECTRICAL ENGINEERING
SECOND YEAR (FOURTH SEMESTER)

W.E.F. ADMISSION BATCH 2023-24

Sl. No.	Category	Course Code	Course	Contact Hrs. L-T-P	Credit	University Marks	Internal Evaluation
Subject (Theory)							
1	PC	EEPC2003	Electrical Machines – II	3-0-0	3	100	50
2	PC	EEPC2004	Electrical Measurement & Instrumentation	3-0-0	3	100	50
3	PC	EEPC2005	Power Electronics	3-0-0	3	100	50
4	PC	EOPC2003	Signals & Systems	3-0-0	3	100	50
5	PC(ACC)	PCAC2008	Machine Learning Techniques and Applications	3-0-0	2	100	50
		PCAC2009	Big Data Integration and Management				
		PCAC2010	Application Development – Tools & Technologies				
		PCAC2011	Cloud Infrastructure & Applications				
		PCAC2012	Internet of Things and Cloud				
		PCAC2013	Robotics : Mobility & Design				
		PCAC2014	IT Fundamentals for Cybersecurity – II				
6	HS	HSHS2002	Organizational Behaviour	3-0-0	2	100	50
		HSHS2001	Engineering Economics				
Subject (Sessional / Practical)							
7	PC	EEPC2203	Electrical Machines – II Lab.	0-0-3	1.5	–	100
8	PC	EEPC2204	Electrical Measurement & Instrumentation Lab.	0-0-3	1.5	–	100
9	PC	ECPC2202	Power Electronics Lab.	0-0-3	1.5	–	100
10	PC	EOPC2203	Signals & Systems Lab.	0-0-3	1.5	–	100
			Total	**18-0-12**	**22**	**600**	**700**

Note : Minimum four (04) weeks of Summer Course / Training / Internship / Skill Course / etc. after 4th Semester.

Click here to view/download the syllabus of the subjects.

ECPC2202 POWER ELECTRONICS LAB. (0-0-3)

Course Learning / Program Objectives: This course will enable students to:

PO1 Gain a thorough understanding of the characteristics and behavior of key power semiconductor devices, including SCR, IGBT, and MOSFET, through practical V-I characteristic analysis and theoretical studies.

PO2 Acquire the ability to design, analyze, and implement single-phase and three-phase rectifier circuits, both full-wave (mid-point and bridge type) and semi converters, for different types of loads (resistive and inductive).

PO3 Learn to design and test DC-DC converters, including buck and boost converters, to understand their operation, performance parameters, and applications in power management.

PO4 Develop the ability to accurately measure and analyze key parameters such as latching and holding currents in SCRs, ensuring proper device operation and enhancing understanding of their dynamic performance in various applications.

PO5 Evaluate single-phase and three-phase PWM voltage source inverters (VSI), focusing on their performance, efficiency, and control strategies, particularly using PWM control techniques

Sl.	Name of the Experiment	Hrs.
1.	Study of the V-I characteristics of SCR, IGBT and MOSFET.	3
2.	Study of the cosine controlled triggering circuit	3
3.	To measure the latching and holding current of a SCR	3
4.	Study of the single phase half wave controlled rectifier and semi converter circuit with R and R-L Load	3
5.	Study of single phase full wave controlled rectifier circuits (mid point and Bridge type) with R and R-L Load	3
6.	Study of three phase full wave controlled rectifier circuits (Full and Semi converter) with R and R-L Load	3
7.	Study of the Buck converter	3
8.	Study of the Boost converter	3
9.	Study of the single phase PWM voltage source inverter.	3
10.	Study the performance of three phase VSI with PWM control.	3

EEPC2003 ELECTRICAL MACHINES-II (3-0-0)

Module I (08 Hours)
Three-phase synchronous generators:
Construction, Salient pole type and Cylindrical rotor structure, Armature windings, Winding factor, EMF equation, Armature reaction, Synchronous impedance, Alternator on load, Phasor diagrams, Open Circuit and Short Circuit tests, Short Circuit Ratio, Voltage regulation by EMF, MMF and ZPF methods, Two reactance concept of Salient pole Synchronous machines, Slip test, Power equations, Power angle characteristics.

Module II (06 Hours)
Parallel operation of alternators:
Requirements for parallel operation, synchronizing of alternators, three dark lamp method, synchroscope, synchronizing current, synchronizing power, synchronizing torque, effect of increasing the excitation, effect of increasing the driving torque and effect of change in speed of one of the alternators, load sharing between two alternators.

Module III (04 Hours)
Synchronous motors: Rotating magnetic field, operating principle of a synchronous motor, phasor diagrams, power equations, load angle, 'V' and inverted 'V' curves, synchronous condenser, starting methods, hunting.

Module IV (06 Hours)
Three-phase induction motors: Construction, principle of operation, types, squirrel cage rotor, slip ring induction motor, slip, torque equations, starting torque, full load torque, maximum torque, torque-slip and torque-speed characteristics, effect of rotor resistance, effect of change in supply voltage, effect of change in frequency, power losses and efficiency, synchronous watt, equivalent circuit of induction motor, phasor diagrams, power output, testing of induction motors, No-load test, Blocked rotor test, load test, measurement of slip, circle diagram.

Module V (06 Hours)
Starting and speed control of three-phase induction motors: DOL starting, stator resistance starting, auto transformer starting, star-delta starting, starting of sip ring induction motors, speed control by variation of supply voltage-supply frequency, rotor resistance control, crawling and cogging effects.
Single-phase induction motors: Construction, principle of operation, double field revolving theory, equivalent circuit, performance characteristics, starting methods, capacitor start-capacitor run single phase induction motors.

Course Outcomes (COs)

CO1: Explain the construction and working principles of synchronous generators, derive EMF equations, and analyze armature reaction and voltage regulation. (Knowledge, Understanding)

CO2: Demonstrate the requirements and procedures for the parallel operation of alternators and analyze the impact of synchronizing current, power, and torque on system stability and load sharing. (Application, Analysis)

CO3: Describe the construction, operating principles, and characteristics of synchronous motors, and analyze V and inverted V curves for performance assessment. (Knowledge, Understanding, Analysis)

CO4: Explain the structure, operation, and torque characteristics of three-phase induction motors, evaluate effects of rotor resistance and supply variations, and analyze equivalent circuits. (Understanding, Application, Analysis)

CO5: Analyze different starting and speed control methods for induction motors, assess performance of single-phase induction motors, and apply theories like double field revolving theory for performance analysis. (Analysis, Evaluation)

Textbooks:

1. "Theory & Performance of Electrical Machines" by J.B. Gupta, 15th edition, S. K. Kataria & Sons, reprint 2015.
2. Fitzgerald& Kingsley's "Electric Machinery", Stephen D. Umans, 7th edition, McGrawHill publishers, 2014.

Reference books:

1. "Electric Machinery" by P.S. Bimbhra, 2nd edition, Khanna Publishing House, 2022.
2. "Electric Machines" by D.P. Kothari and I.J. Nagrath, 5th edition, McGrawHill publishers, 2017.
3. "The Performance and Design of Alternating Current Machines", by M. G. Say, CBS Publishers & Distributors, 2005.

EEPC2004 ELECTRICAL MEASUREMENT AND INSTRUMENTATION (3-0-0)

Module I (8 Hours)

Measurement and Error:Definition, Accuracy and Precision, Significant Figures, Types of Errors. Standards of Measurement:Classification of Standards, Electrical Standards, IEEE Standards.

Measuring instruments: Absolute and secondary instrument, indicating and recording instrument.

Types Of Measuring Instrument: Ammeter and Voltmeter: Derivation for Deflecting Torque of; PMMC, MI (Attraction and Repulsion Types), Electro Dynamometer and Induction Type Ammeters and Voltmeters. Energy Meters and Wattmeter. Construction, Theory and Principle of Operation of Electro-Dynamometer and Induction Type Wattmeter, Compensation, Creep, Error, Testing, Single Phase and Polyphase Induction Type Watt-Hour Meters. Frequency Meters: Vibrating Reed Type, Electrical Resonance Type, Power Factor Meters.

Module II (8 Hours)

Measurement of Resistance, Inductance And Capacitance:

Resistance: Measurement of Low Resistance by Kelvin‟s Double Bridge, Measurement of Medium Resistance, Measurement of High Resistance, Portable Resistance Testing Set (Megohmmeter), Measurement of Resistance of Earth Connections.

Inductance: Measurement of Self Inductance by Ammeter And Voltmeter, and AC Bridges (Maxwell‟s, Hay‟s, & Anderson Bridge), Measurement of Mutual Inductance by Felici‟s Method, and as Self Inductance. Capacitance: Measurement of Capacitance by Ammeter and Voltmeter, and AC Bridges (Owen‟s, Schering &Wien‟s Bridge), Screening of Bridge Components and WagnorEarthing Device.

Transducer: Strain Gauges, Thermistors, Thermocouples, Linear Variable Differential Transformer
(LVDT), Capacitive Transducers, Peizo-Electric transducers, Optical Transducer, Hall Effect Transducer.

Module III (6 Hours)

Galvanometer: Construction, Theory and Principle of Operation of D‟arsonval, Vibration (Moving Magnet & Moving Coil Types), and Ballistic Galvanometer, Influence of Resistance on Damping, Logarithmic Decrement, Calibration of Galvanometers, Galvanometer Constants.

Potentiometer: Construction, Theory and Principle of Operation of DC Potentiometers (Crompton, Vernier, Constant Resistance, & Deflection Potentiometer), and AC Potentiometers (Drysdale-Tinsley & Gall-Tinsley Potentiometer).

Module IV (6 Hours)

Instrument Transformers:Potential and current transformers, ratio and phase angle errors, phasor diagram, methods of minimizing errors.

Electronic Instruments for Measuring Basic Parameters: Amplified DC Meters, AC Voltmeters Using Rectifiers, True RMS Voltmeter, Digital Multi-meter & Digital Frequency meter: (Block diagram, principle of operation)

Module V (2 Hours)
Oscilloscope: Block Diagrams, Delay Line, Multiple Trace, Oscilloscope Probes, Oscilloscope Techniques, Introduction to Analog and Digital Storage Oscilloscopes, Measurement of Frequency, Phase Angle, and Time Delay Using Oscilloscope.

Course Outcomes: On completion of this course, students are able to:
CO1: Explain the fundamentals of measurement, error analysis, and standards in electrical measurements.
CO2: Classify and evaluate various types of measuring instruments, including ammeters, voltmeters, energy meters, wattmeters, and frequency meters, understanding their principles and error sources.
CO3: Measure electrical quantities such as resistance, inductance, and capacitance using suitable methods and AC bridge techniques.
CO4: Illustrate the principles, construction, and operation of transducers like strain gauges, thermistors, thermocouples, and other sensing devices.
CO5: Apply the principles of operation and calibration of galvanometers and potentiometers for precise electrical measurement.
CO6: Evaluate instrument transformers, such as potential and current transformers, analyzing errors and correcting them.
CO7: Operate and interpret readings from electronic measuring instruments, such as digital multimeters and oscilloscopes, for frequency, phase, and time-delay measurements**.**

Text Book(s):
1. A Course in Electrical and Electronic Measurements and Instrumentation – A K Sawhney – Dhanpat Rai & Co.
2. Modern Electronic Instrumentation and Measurement Techniques – Helfrick& Cooper – Pearson Education.

Reference Book(s):
1. Electrical Measurements and Measuring Instruments – Golding &Widdis – 5th Edition, Reem Publication.
2. Electronic Instrumentation – H C Kalsi – 2nd Edition, Tata Mcgraw Hill
3. Electronic Measurement and Instrumentation – Oliver & Cage – Tata Mcgraw Hill

EEPC2005 POWER ELECTRONICS (3-0-0)

Module I (06 Hours)
Power Semiconductor Devices and Uncontrolled Rectifiers:
Introduction, working and characteristics of power diodes – power transistors – power MOSFETs – IGBTs.
Uncontrolled Single-phase Half-wave – Full-wave – Bridge rectifiers, Three-phase Half-wave and Bridge rectifiers, performance parameters, and waveform analysis for R and RLloads.
Thyristors, static I-V characteristics, turn-on methods, Gate characteristics, two transistor model of Thyristor, Ratings of Thyristors, Thyristor protection, Design of Snubber circuits, Series and Parallel operation of Thyristors, Thyristor commutation techniques: Natural and Forced commutation.

Module II (08 Hours)
Phase Controlled Rectifiers:
Principle of Phase control, Controlled Single-phase Half-wave rectifier, Full-wave converters, Full-wave Bridge converters, Semiconverter, Full converter, analysis with continuous and discontinuous current conduction, performance parameters, and waveform analysis for R – RL – RLE loads, operation with and without free-wheeling diodes.
Controlled Three-phase Half-wave converter – Full-wave converters, Full-wave Bridge converter, Semiconverter, Full converter, performance parameters and waveform analysis for R – RL – RLE loads, Dual converter, effect of source impedance on performance of converters.

Module III (04 Hours)
DC to DC Converters:
Principle of step-down and step-up operation, control strategies, generation of duty cycle, Buck, Boost, Buck-Boost, performance parameters, and waveform analysis.
Types of chopper circuits: first-quadrant, second-quadrant, two-quadrant, four-quadrant choppers, thyristor chopper circuits.

Module IV (06 Hours)
DC to AC Converters:
Principle of operation, Single-phase Voltage source Bridge inverter, Three-phase Bridge inverter, 180-degree conduction, 120-degree conduction, performance parameters, and waveform analysis, Introduction to Current Source Inverter.
Voltage control of single-phase inverter, pulse-width modulation, single pulse width modulation, sinusoidal pulse width modulation.
Voltage control of three-phase inverters, sinusoidal PWM.

Module V (06 Hours)
AC to AC converters and Drives:
AC voltage controllers: principle of phase control, principle of integral cycle control, singlephase full wave voltage controllers with R and RL loads, performance parameters and waveform analysis.
Cyclo converters: single phase Cyclo converters, performance parameters and waveform analysis.
Introduction of Power Electronics application in Electric Drives.

Course Outcomes (COs)

CO1: Explain the principles, characteristics, and applications of power semiconductor devices and uncontrolled rectifiers. (Understanding - Level 2)

CO2: Analyze and design single-phase and three-phase phase-controlled rectifiers with different load types (R, RL, RLE) and evaluate the performance under various conditions. (Analyzing - Level 4)

CO3: Describe the operating principles and control strategies of DC-DC converters and evaluate different chopper configurations and their applications. (Applying/Analyzing - Level 3/4)

CO4: Analyze the operational characteristics of DC-AC inverters and apply control techniques to single-phase and three-phase inverter circuits. (Applying - Level 3)

CO5: Explain AC-AC conversion techniques, including AC voltage controllers and cyclo-converters, and demonstrate their use in electric drives. (Understanding/Applying - Level 2/3)

Textbooks:

1. "Power Electronics" by P.S. Bimbhra, 7th edition, Khanna publishers,2022.
2. "Power Electronics-Devices, Circuits, and Applications" by Muhammad H. Rashid, 4th edition, Pearson publishers, 2014.

Reference books:

1. "Power Electronics, Converters, Applications, and Design", by Ned Mohan, T. M. Undeland, W. P. Robbins, 3rd Edition, Wiley publishers, 2022.
2. "Power Electronics", by Daniel W. Hart, Mc Graw Hill publishers, 2011.

EEPC2203 ELECTRICAL MACHINES - II LAB. (0-0-3)

Course Learning/Program Objectives: This course will enable students to:

PO1 Understand methods for determining voltage regulation of alternators: synchronous impedance method and zero power factor method.

PO2 Analyse V curve and inverted V curves of synchronous motors.

PO3 Learn speed control techniques for three-phase induction motors using variable frequency drives.

PO4 Determine parameters of synchronous machines, including positive, negative, and zero sequence reactance.

PO5 Explore power angle characteristics of alternators and parameters of capacitor start single-phase induction motors, as well as study parallel operation of alternators.

Sl. No	Name of the Experiment	Hrs.
1.	Determination of the voltage regulation of an alternator by synchronous impedance method and zero power factor (ZPF) method.	**3**
2.	Determination of the V curve and inverted V curves of a synchronous motor.	**3**
3.	Speed control of a three-phase induction motor using variable frequency drives.	**3**
4.	Determination of parameters of synchronous machine. a. Positive sequence reactance. b. Negative sequence reactance. c. Zero sequence reactance.	**3**
5.	Determination of power angle characteristics of an alternator.	**3**
6.	Determination of parameter of a Capacitor start single phase induction motor.	**3**
7.	Study of parallel operation of two alternators.	**3**
8.	Measurement of direct and quadrature axis reactance of a salient pole synchronous machine by Slip test.	**3**
9.	Determination of parameters of three phase induction motor from No Load Test and Blocked Rotor Test.	**3**
10.	Determination of Efficiency, Plotting of Torque-Slip Characteristics of Three Phase Induction motor by Brake Test.	**3**

EEPC2204 ELECTRICAL MEASUREMENT& INSTRUMENTATION LAB. (0-0-3)

Course Learning/Program Objectives: This course will enable students to:

PO1 Understand the principles of strain gauge application in measuring strain in cantilever beams.

PO2 Investigate the temperature-voltage characteristics of J type thermocouples to accurately measure temperature variations in different environments and applications.

PO3 Gain practical experience in using LVDTs for precise linear displacement measurements and understand the calibration procedures to ensure accurate readings.

PO4 Master the techniques of measuring unknown resistances and capacitances using Wheatstone, Maxwell, De-sauty's, Kelvin's Double, and Schering bridges.

PO5 Develop proficiency in measuring unknown inductances using Maxwell, Hay's, Anderson, and Kelvin's bridges.

Sl. No	Name of the Experiment	Hrs.
1.	To measure strain developed in a cantilever beam using strain gauge	3
2.	Study of temperature voltage characteristics of J type thermocouple	3
3.	Measurement of linear displacement using LVDT	3
4.	Measurement of unknown resistance by Wheatstone Bridge	3
5.	Measurement of unknown inductance by Maxwell Inductance Bridge	3
6.	Measurement of unknown capacitance usingDe-sauty's Bridge	3
7.	Measurement of unknown resistance using Kelvin's Double Bridge	3
8.	Measurement of unknown capacitanceusing Schering Bridge	3
9.	Measurement of unknown inductanceusing Hay's Bridge	3
10.	Measurement of unknown inductance Anderson Bridge	3

EOPC2003 SIGNALS AND SYSTEMS (3-0-0)

Course Objective:

- To understand the fundamental characteristics of signals and systems
- To understand signals and systems in terms of both the time and transform domains, taking advantage of the complementary insights and tools that these different perspectives provide.
- To develop the mathematical skills to solve problems involving convolution, correlation, and sampling.

Module 1 Basics of continuous-time and discrete-Time Signals, Elementary signals (Impulse, Ramp, step, exponential), Classification of Discrete-Time Signals, Simple Manipulation of Discrete time signals, Discrete-Time Systems:Block Diagram Representation, Classification and Interconnection.	**7 Hours**
Module 2 Analysis of Discrete-Time LTI Systems: Techniques, Response of LTI Systems, Properties of Convolution, Causal LTI Systems, Stability of LTI Systems; Discrete-Time Systems described by Difference Equations; Implementation of Discrete-Time Systems. Correlation of Discrete-Time Signals: Cross correlation and Autocorrelation Sequences, Properties.	**8 Hours**
Module 3 Fourier series representation: Continuous time Fourier series (CTFS), Dirichlet conditions, properties of CTFS, discrete time Fourier series (DTFS), properties of DTFS .	**4 Hours**
Module 4 Sampling: Representation of a Continuous-Time Signal by Its Samples, The Sampling Theorem. Reconstruction of a Signal from Its Samples Using Interpolation, Aliasing, Discrete-Time Processing of Continuous-Time Signals	**4 Hours**
Module 5 The continuous-Time Fourier Transform (CTFT): Basic concepts of the Fourier Transform, Fourier Transform of periodic and Aperiodic signals. Properties of the continuous-Time Fourier Transform. The discrete time Fourier transform(DTFT): Fouriertransform of periodic and Aperiodic signals, properties of DTFT.	**7 Hours**

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

- CO1: understand the basic properties of signals and systems in both continuous and discrete time.
- CO2: classify systems based on their properties and determine the response of LTI system using convolution.
- CO3: analyse the spectral characteristics of continuous-time periodic and aperiodic signals using Fourier analysis.
- CO4: understand the process of sampling and the effects of under sampling.
- CO5: apply the discrete time Fourier transform for analysis of discrete-time signals.

Text Books:

1. Digital Signal Processing — Principles, Algorithms and Applications, John. G. Proakis and Dimitris. G. Manolakis, 4th Edition, Pearson.
2. Signals & Systems by Alan V Oppenheim, A.S. Willsky and S.H. Nawab 2nd Edition, Pearson.

3. Signals and Systems by Simon Haykin and Barry Van Veen, 2nd Edition, Willey.
4. Fundamentals of Signals and Systems - M J Roberts, TMH

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EOPC2203 SIGNALS AND SYSTEMS LABORATORY (0-0-3)

Course Objectives:

- To understand basic signal operations
- To develop the student's ability to analyse signals and systems using software.
- To familiarize convolution and Frequency transformation

List of experiments:

(Any 10 Experiments)

1. Introduction to MATLAB and its basic toolboxes required for the analysis of signals and systems. To study use variables, vectors, Matrices & its functions in MATLAB. To Perform basic operations such as addition, subtraction, multiplication, division and transpose of vector and Matrix and plot its results.
2. Generation of basic continuous-time periodic signals, i.e., sine, cosine, square, etc. and plot its results in MATLAB.
3. Generation of basic continuous-time aperiodic signals, i.e., ramp, exponential, rectangular pulse, step, impulse, etc. and plot its results in MATLAB.
4. Computation of convolution of discrete-time periodic signals in MATLAB using program logic and inbuilt function.
5. Computation of convolution of discrete-time aperiodic signals in MATLAB using program logic and inbuilt function.
6. Implementation of a difference equation in MATLAB.
7. Generation of frequency response of an LTI system from its impulse response in MATLAB.
8. Computation of discrete-time Fourier series (DTFS) of fundamental signals in MATLAB.
9. Computation of discrete-time Fourier transform (DTFT) of fundamental signals in MATLAB.
10. Frequency domain analysis of decimation and interpolation of signals in MATLAB.
11. Computation of Cross correlation of sequence x(n) and y(n) verify the property in MATLAB.
12. Computation of auto correlation of sequence x(n) and y(n) verify the property in MATLAB.
13. Generation of randomly distributed random sequences of N=1000in the interval (-0.5 to +0.5) and find its mean and variance in MATLAB
14. Generation of Gaussian distributed random sequences of N=1000 in the interval and find its mean and variance in MATLAB.

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

CO1:analyse different signals using simulation tools.

CO2:develop signal processing operations

CO3: Examine the properties of FT

CO4: analyse frequency domain representation of signals using Fourier series and Fourier transform

CO5: apply signal analysis to real time application.

HSHS2002 ORGANISATIONAL BEHAVIOUR (3-0-0)

Objectives:
The objective is to develop an understanding of the behavior of individuals and groups inside organizations and to enhance skills in understanding and appreciating individuals, interpersonal, and group process for increased effectiveness both within and outside of organizations. Further, it is to develop theoretical and practical insights and problem-solving capabilities for effectively managing the organizational processes.

Module-I: (06 Hrs.)
Fundamentals of OB: Definition, scope and importance of OB, Relationship between OB and the individual, Evolution of OB, Theoretical framework (cognitive), behavioristic and social cognitive), Limitations of OB.

Module-II: (12 Hrs.)
Attitude: Importance of attitude in an organization, Right Attitude, Components of attitude, Relationship between behavior and attitude, Developing Emotional intelligence at the workplace, Job attitude, Barriers to changing attitudes.
Personality and values: Definition and importance of Personality for performance, The Myers-Briggs Type Indicator and The Big Five personality model, Significant personality traits suitable to the workplace (personality and job — fit theory), Personality Tests and their practical applications.
Perception: Meaning and concept of perception, Factors influencing perception, Selective perception, Attribution theory, Perceptual process, Social perception (stereotyping and halo effect). Motivation: Definition & Concept of Motive & Motivation, The Content Theories of Motivation (Maslow's Need Hierarchy & Herzberg's Two Factor model Theory), The Process Theories (Vroom's expectancy Theory & Porter Lawler model), Contemporary Theories — Equity Theory of Work Motivation.

Module-III: (10 Hrs.)
Foundations of Group Behavior: The Meaning of Group & Group behavior & Group Dynamics, Types of Groups, The Five — Stage Model of Group Development.
Managing Teams: Why Work Teams, Work Teams in Organization, Developing Work Teams, Team Effectiveness & Team Building.
Leadership: Concept of Leadership, Styles of Leadership, Trait Approach Contingency Leadership Approach, Contemporary leadership, Meaning and significance of contemporary leadership, Concept of transformations leadership, Contemporary theories of leadership, Success stories of today's Global and Indian leaders.

Module-IV: (08 Hrs.)
Organizational Culture : Meaning & Definition of Organizational Culture, creating & Sustaining Organizational Culture, Types of Culture (Strong vs. Weak Culture, Soft Vs. Hard Culture & Formal vs. Informal Culture), Creating Positive Organizational Culture, Concept of Workplace Spirituality.

Module-V: (09 Hrs.)
Organizational Change: Meaning, Definition & Nature of Organizational Change, Types of Organizational Change, Forces that acts as stimulants to change.
Implementing Organizational Change : How to overcome theResistance to Change,
Approaches to managing Organizational Change, Kurt Lewin's-Three step model, Seven Stage model of Change & Kotter's Eight-Step plan for Implementing Change, Leading the Change Process, Facilitating Change, Dealing with Individual & Group Resistance, Intervention Strategies for Facilitating Organizational Change, Methods of Implementing Organizational Change, Developing a Learning Organization.

Course Outcomes:
At the end of the course, students will be able to:
1. Understand the basic concepts of OB, change management, organizational culture and their implementation in organizations.
2. Identify and examine team characteristics for improved organizational performance.
3. Apply theories and frameworks to solve problems and take effective decisions for organizational success.

4. Analyze group behavior and leadership styles for effective people management.
5. Evaluate individual personality types and group behaviours for improving organizational processes and practices.
6. Develop leadership competency to manage organizational situations.

Books:

1. Understanding Organizational Behaviour, Parek, Oxford
2. Organizational Behaviour, Robbins, Judge, Sanghi, Pearson.
3. Organizational Behaviour, K. Awathappa,HPH.
4. Organizational Behaviour, VSP Rao, Excel
5. Introduction to Organizational Behaviour, Moorhead, Griffin, Cengage.
6. Organizational Behaviour, Hitt, Miller, Colella, Wiley.

PCAC2012 INTERNET OF THINGS AND CLOUD (3-0-0)

OVERALL COURSE OBJECTIVES: To provide learners with an in-depth understanding of the evolution of Internet of Things and related technologies, equip them with the skills to utilize advanced technology platforms like DragonBoard™ and AWS, and allow them to apply these skills in developing innovative IoT-enabled applications and systems.

LEARNING OUTCOMES: On successful completion of the course the students shall be able to:

1. Understand, compare, and explain how telephony and media delivery networks operate.
2. Understand circuit switched networks and packet switched networks and their trade-offs.
3. Comprehend key innovations that have transformed the communication, entertainment, and consumer electronics industry.
4. Describe the DragonBoard™ 410c peripherals, I/O expansion capabilities, computing capabilities, and connectivity capabilities.
5. Use Linux terminal for embedded purposes and configure integrated development environment (IDE) for software development.
6. Understand and utilize various AWS cloud services such as EC2, IoT and more, to build and integrate projects that leverage the cloud.

COURSE CONTENT:

Module 1: Internet of Things: How did we get here? [21 Hours]

This course explores the convergence of multiple disciplines that have led to the advent of present-day smartphones and the Internet of Things. The lessons explore the evolution of telephony networks, broadcast networks, and consumer electronics, along with the impact of the internet, multimedia content, smartphones, and apps. It also covers the emerging, interconnected platform: the Internet of Things. Upon completion, learners will understand how peer-to-peer networks differ from broadcast networks, the tradeoffs between circuit-switched and packet-switched networks, and the workings of several key innovations and digital services. The course provides an important grounding for anyone interested in the technological development of the Internet of Things, and further resources for a more in-depth exploration of the topics.

Sub-Topics
Circuit Switched Networks
Computer Telephony
Features and Apps
Future Outlook
Packet Switched Networks
Wireless Technologies

Formative Assessments:
16 quizzes.

Module 2: Internet of Things V2: DragonBoard™ bring up and community ecosystem [21 Hours]

This course is designed for individuals seeking to develop the skills needed to prototype embedded products using advanced technologies. The course utilizes the DragonBoard™ 410c single board

computer (SBC) to provide a hardware and software development environment for Internet of Things specialization courses. Ideal for learners interested in using Linux for embedded purposes, pursuing a career in the design and development of Internet of Things products, or those involved in entrepreneurial, innovative, or DIY communities, this course offers both theoretical knowledge and hands-on development practice. Key learning outcomes include understanding the DragonBoard™ 410c peripherals, navigating a Linux terminal, configuring an integrated development environment (IDE) for software development, utilizing Git and GitHub for version control, and creating projects that interface with sensors and actuators through GPIO and Arduino.

Sub-Topics
Advanced Projects and Code
Changing your Operating System (Supplemental / Optional)
DragonBoard Bringup and Ecosystem
Mezzanines and Sensors (Canned Demos w/ software)
Rescuing your Bricked Board (Supplemental / Optional)

Formative Assessments:

5 quizzes and 1 peer-review assignment.

Module 3: Internet of Things V2: Setting up and Using Cloud Services [10 Hours]

This course provides an introduction to Amazon Web Services (AWS) and its significance, enabling learners to make informed design decisions about which services to use. The course covers interfacing with the AWS cloud, developing software for data sending and receiving, and how to structure projects with diverse services. Upon completion, learners will have a clear understanding of the cloud, be able to install and configure the AWS CLI and SDK on a Linux system, utilize various AWS services such as EC2, IoT, etc., build projects heavily leveraging the cloud, and integrate the cloud into embedded systems.

Sub-Topics
Advanced Projects and Code - Deep dive
Systems Architecture

Cloud 101 for Dragonboard 410c
Real projects using AWS Cloud services

Formative Assessments:

3 quizzes and 1 peer-review assignment.

ASSESSMENT:

For summative assessments, Coursera will provide question banks for which exams can be conducted on the Coursera platform or the faculty will create their own assessments.

Note: If a Course or Specialization becomes unavailable prior to the end of the Term, Coursera may replace such Course or Specialization with a reasonable alternative Course or Specialization.