Syllabus for

B.E. V - Semester

for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE551C	Field Theory	03 - Credits (2 : 2 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 52		SEE Marks : 50

UNIT – I	(7L-6THours)

Review of Vector Analysis:
Introduction to Scalars and vectors
Coulomb's Law and Electric Field Intensity:
Experimental law of Coulomb, electric field intensity, field due to continuous volume charge distribution, field of a line charge, field of a sheet charge.
Electric Flux Density, Gauss' Law and Divergence:
Electric Flux Density, Gauss' Law, Divergence. Maxwell's first equation (Electrostatics), vector operator V and the divergence theorem.

UNIT – II	(6L-7THours)

Energy and Potential: Energy expended in moving a point charge in an electric filed, the line integral, definition of potential difference and potential. The potential field of a point charge and system of charges, potential gradient, the dipole.
Conductors, Dielectrics and Capacitance: Current and current density, Continuity of current, metallic conductors, Conductor properties and Boundary conditions, capacitance.

UNIT – III	(7L-6THours)

The Steady Magnetic Field: Biot-Savart law, Ampere's circuital law, Curl, Stokes' theorem, magnetic flux and flux density.
Magnetic Forces:
Force on a moving charge and differential current element, Force between differential current elements, Force and torque on a closed circuit.

UNIT – IV	(6L-7THours)

Materials and Inductance:
The nature of magnetic materials, Magnetization and permeability, Magnetic boundary conditions, Magnetic circuit, Potential energy and forces on magnetic materials.
Time Varying Fields and Maxwell's Equations:
Faraday's law, displacement current, Maxwell's equation in point and Integral form.

Reference Books:

1. William H.Hayt Jr. and John A Buck, "Engineering Electromagnetics**",** 17th edition, Tata McGraw Hill, 2012.
2. John Karuss and Daniel A Fleisch, "Electromagnetics with Applications" V-edition McGraw-Hill, 1999.
3. Edward C. Jordan and Keith G Balmain, **"**Electromagnetic Waves and Radiating Systems**,"** II- edition, Prentice Hall of India / Pearson Education, 1968. Reprint 2002.
4. Dr. D. Ganesh Rao, "Field Theory" Sanguine Technical Publishers, 1st Edition, 2014.

Course Outcomes:
After completion of the course the students will be able to,

1. Identify differential coordinate elements for the various electric and magnetic field

applications
2. Estimate the flux density, field intensity of electric and magnetic fields for various charges
3. Analyze the time varying and static electric and magnetic fields for various charges
4. Select the suitable time varying Maxwell's equation for real-time application of electromagnetism.

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE551C.1	3	1	1	1	3	1		1		1		1
2	UEE551C.2	3	2	1	1				1		1		1
3	UEE551C.3	3	2	2	2	1		1	1		1		1
4	UEE551C.4	3	3	3	2	1			1	1	1	1	2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE552C	Digital Signal Processing	03 - Credits (2 : 2 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 52		SEE Marks : 50

UNIT – I	(7L-6THours)

Discrete Fourier Transform:

Introduction, Definition, and derivation of DFT and IDFT, Properties-linearity, shift, Symmetry etc., circular convolution, periodic convolution, use of tabular arrays, circular arrays, Stock Ham's methods, Linear convolution-two finite duration sequences, One finite and one infinite duration –overlap add method-Problems

UNIT – II	(7L-6THours)

Fast Fourier Transform Algorithms:

Introduction, decimation in time algorithm (DIT-FFT, DIT-IFFT), First decomposition, Continuation of decomposition, number of computations, number of multiplications, Computational efficiency-Problems

Design of FIR Digital filters:

Introduction, Windowing, rectangular, Hamming window-Problems

UNIT – III	(7L-6THours)

Design of IIR Digital filters:

Introduction, all pole analog filters- Butterworth and Chebyshev, Design of analog filters, Bilinear Transformation, Design of digital Butterworth and Chebyshev filters, Frequency transformations-Problems

UNIT – IV	(7L-6THours)

Realization of Digital Systems:

Introduction, block diagrams and SFG's, Realization of IIR systems- direct form, cascade form, Parallel form, Realization of FIR systems- direct form, cascade form, Linear phase realizations-Problems

DSP Processors TMS320:

Architecture and electrical applications (block diagram approach)

Reference Books:

1. Digital Signal Processing Principle, algorithms and applications 4th edition by Proakis, Pearson Education 2012
2. Digital Signal Processing by Sanjith K. Mithra Edition, 2013
3. Digital Signal Processing by Oppenheim, Pearson Education / PHI, 2015
4. Digital Signal Processing by Salivatanam, A Vallavaraj, Gnanapriya , TMH 2011
5. Digital Signal Processing by Ifeachor Emmauel, Pearson Education, 2nd edition 2010

Course Outcomes:

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

1. Recall DFT, IDFT, and basic properties of DSP
2. Derive DFT properties, FFT algorithms, filter equations, and convolution output and classify filters
3. Assess the output of system by linear & circular convolution, Stockhams method, and FFT algorithms
4. Implement/realize the discrete LTI system in direct form I & II, cascade and parallel forms and Design a filter for the given specifications

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE552C.1	3	1	1		3	1		1		1		2
2	UEE552C.2	3	2	1					1		1		2
3	UEE552C.3	2	2		2	1		1	1		1		1
4	UEE552C.4	2	3	3	2	1			1	1	1	1	2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE553C	Control Systems	03 - Credits (2 : 2 : 0)
Hours/Week : 04		CIE Marks : 50
Total Hours : 52		SEE Marks : 50

UNIT – I	(7L-8T Hours)

Introduction and Transfer Function of Systems: Classification of control systems, open loop and closed loop systems, effects of feedback, mathematical models of physical systems; definition of transfer function, mechanical systems, rotational systems, electrical systems, analogous systems.

UNIT – II	(6L-6T Hours)

Block Diagrams and Signal Flow Graphs: Block diagrams (BD), reduction of BD, signal flow graphs (SFG), drawing block diagram and SFG of simple networks, Mason's gain formula, converting BD into SFG.

UNIT – III	(7L-6T Hours)

Time Response of Feed Back Control Systems: Standard test signals, unit step response of first and second order systems, time response specifications, and Time response specifications of second order systems, steady state errors and error constants.

Stability Analysis: Concepts of stability, necessary conditions for stability, Routh's stability criterion.

Root–Locus Analysis: Root locus concepts, construction of root loci.

Introduction to State Variable Analysis: Concepts of state, state variables and state model, state models for linear continuous time systems, conversion of state model to transfer function and transfer function to state model.

UNIT – IV	(6L-6T Hours)

Frequency Domain Analysis: Introduction, frequency domain specifications, correlation between time and frequency response, method to draw bode plot, phase margin, gain margin.

Nyquist stability criterion.

Reference Books:

1. Norman S. Nise "Control System Engineering", McGraw Hill, 2010.
2. Benjamin C. Kuo, "Automatic Control System", 7th Edition, PHI, 2010.
3. Richard C. Dorf Robert H. Bishop "Modern Control Systems", 8th Edition, Addison-Wesley,1999
4. Katsuhiko Ogata, Modern Control Engineering, Prentice–Hall of India Private Limited, 2001

Course Outcomes:

After completion of the course the students will be able to:

1. Classify control systems based on a number of ways and select them for particular applications.
2. Develop mathematical modeling of LTI control systems via differential equation formation, transfer function, and state space analysis.
3. Employ time domain analysis to predict and diagnose transient performance parameters of LTI control systems for standard input functions.
4. Formulate different types of analysis in frequency domain to obtain the stability of the LTI control systems.

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	**UEE553C.1**	**3**	**3**	**2**	**2**								**1**
2	**UEE553C.2**	**3**	**3**	**3**	**2**								**1**
3	**UEE553C.3**	**3**	**3**	**2**	**2**						**1**		**1**
4	**UEE553C.4**	**3**	**3**	**2**	**2**						**1**		**1**

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE554C	Generation Transmission and Distribution	03 - Credits (3 : 0 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I	(10 Hours)

Electrical Power Generation:

Hydro Power Generation: Site selection, Line diagram representation, Classification, Merits and Demerits. Thermal Power Generation: Site selection, Line diagram representation, Classification, Merits and Demerits. Nuclear Power Generation: Site selection, Line diagram representation, Classification, Merits and Demerits.

Basic Aspects of Power Generation:

Introduction, Load curve and load duration curve. Terms commonly used in system operation: Load factor, Diversity factor, Demand factor, plant capacity factor, plant utilization factor, Installed capacity, reserve capacity, Cold reserve, hot reserve, Spinning reserve, firm power. Effect of diversity factor on cost of generation. Interconnection of power stations, transfer of power. Economic Loading of interconnected stations.

UNIT – II	(10 Hours)

AC Transmission Systems:

Typical AC transmission system, Advantages of high voltage transmission. Comparison of conductor material in overhead lines: 3 phase 3 wire systems, 3 phase 4 wire system. Components of overhead transmission line: Conductors, Line supports, Insulators – Types, Potential distribution over suspension insulator string, String efficiency, Methods of improving string efficiency. Corona – Factors affecting corona, Imp terms, Methods of reducing corona. Sag in overhead lines- Calculation of sag for equal and unequal supports, Effect of wind and ice loading on sag.

Electrical Parameters of Overhead Transmission Lines:

Constants of Transmission line. Inductance of single phase two wire line, Capacitance of single phase two wire line.

UNIT – III	(10 Hours)

Performance of Transmission Lines:

Classification of overhead Transmission line. Short Transmission line, Medium Transmission line – End condenser method, Nominal T method, Nominal π method, Long Transmission line. Generalized circuit constants (ABCD) of a transmission line.

Underground Cables:

Construction of underground cables, Insulating materials for underground cables, Laying of underground cables. Insulation resistance of single core cable, Capacitance of single core cable, Dielectric stress in a single core cable.

UNIT – IV	(10 Hours)

Distribution Systems:

Classification of distribution systems. Overhead Vs Underground distribution system. Connection schemes of distribution system. Requirements of a distribution system.

DC Distribution:

Types of DC distributors, DC distributor fed at one end- Concentrated loading, Uniform loading. DC distributor fed at both ends - Concentrated loading.

AC Distribution:

AC distribution calculation, Methods of solving AC distribution issues.

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Reference Books:

1. Soni, Gupta and Bhatnagar, "Power System Engineering", 5th edition, Dhanapat Rai and Co.(P) Ltd. Publishers, New Delhi, 2016.
2. Mehta V K and Rohit Mehta, " Principals of Power Systems", 4th edition, S Chand and Company Ltd, Publishers, New Delhi, 2015.
3. Gupta J B, "Transmission and Distribution of Electrical power", 9th edition, Sanjeev jumar Kataria Publishers, New Delhi, 2012.
4. Wadhwa C L, "Generation, Distribution and Utilization of Electrical Power", 3rd edition, New age International (p) Ltd., New Delhi, 2012.

Course Outcomes:

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

1. **List and define** various parameters and features of Electrical power generation, transmission and distribution.
2. **Explain** different mechanical and electrical parameters related to Electrical power generation, transmission and distribution.
3. **Compare and contrast** the features of Electrical power generation, transmission and distribution.
4. **Evaluate/calculate** various parameters related to Electrical power generation, transmission and distribution.

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE554C.1	3							1		1		1
2	UEE554C.2	3	1						1		1		1
3	UEE554C.3	3	3	2	2	1			1		1		1
4	UEE554C.4	3	3	3	3	1			1	1	1		2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE557E	Electrical Machine Design	03 - Credits (3 : 0 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I	(10 Hours)
Principles of Electrical Machine Design: Introduction to design of electrical machines, limitations. Different types of materials and insulators used in electrical machines. **Design of DC Machines:** Output equation, choice of specific loadings and number of poles, design of main dimensions, armature slot dimensions and estimation of ampere turns.	
UNIT – II	**(10 Hours)**
Design of Transformers (Single phase and three phase): Output equation for single phase and three phase transformer, choice of specific loadings, expression tor volts/turn, determination of main dimensions of the core, types of windings and estimation of number of turns and cross sectional area of Primary and secondary coils and Design of tank and cooling tubes.	
UNIT – III	**(10 Hours)**
Design of Induction Motors: Output equation, choice of specific loadings, main dimensions of three phase induction motor, stator winding design, choice of length of the air gap, estimation of number of slots for the squirrel cage rotor, end ring current.	
UNIT – IV	**(10 Hours)**
Design of Synchronous Machines: Output equation, choice of specific loadings, short circuit ratio, design of main dimensions, armature slots and windings, slot details for the stator of salient and non salient pole synchronous machine. Design of rotor of salient pole synchronous machines, magnetic circuits and rotor of non salient pole machine.	

Reference Books:

1. A.K. Sawhney, A Course in Electrical Machine Design, Dhanpat Rai & Co. (P) Limited (2017), ISBN-10: 8177001019, ISBN-13: 978-8177001013.
2. Mittle V.N., Arvind Mittal, Design of Electrical Machines, Standard Publishers Distributors (2009), ISBN-13: 978-81-8014-126-3, ISBN: 81-8014-126-8.
3. V. Rajini, V. S. Nagarajan Electrical Machine Design Pearson Education (May 2018) ISBN-10: 9332585571, ISBN-13: 978-9332585577
4. K. G. Upadhyay Design of Electrical Machines (2010) Publisher: New Age International ISBN: 9788122422825, 8122422829.

Course Outcomes

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

1. Identify, list and define different types of materials, parts, insulators, and the terms associated to electrical machines and its design terms.
2. Explain the specific loadings, design factors for electrical machines.
3. Calculate the design parameters of an electrical machine for a given set of specifications and necessary assumptions as per the Indian standards.
4. Derive the equations with respect to specific loadings, dimensions and other design aspects for electrical machines.

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE557E.1	3	2	2					1		1		1
2	UEE557E.2	3	2	2					1		1		1
3	UEE557E.3	3	3	3	3				1	2	1		1
4	UEE557E.4	3	3	3	2				1		1		2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE555N	Renewable Energy Sources	03 - Credits (3 : 0 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I	(10L-0T Hours)
Introduction to Energy Sources: Classification of Energy Resources; Conventional Energy Resources – Availability and their limitations; Non-Conventional Energy Resources – Classification, Advantages, Limitations; Comparison of Conventional and Non-Conventional Energy Resources. **Solar Energy Basics:** Introduction, Solar Constant, Basic Sun-Earth Angles – definitions and their representation, Solar Radiation Geometry (only theory); Measurement of Solar Radiation Data – Pyranometer and Pyrheliometer. **Solar Thermal Systems:** Principle of Conversion of Solar Radiation into Heat, Solar Water Heaters (Flat Plate Collectors), Solar Cookers – Box type, Concentrating dish type; Solar driers, Solar Still.	
UNIT – II	**(10L-0T Hours)**
Solar Electric Systems: Solar Thermal Electric Power Generation – Solar Pond and Concentrating Solar Collector (parabolic trough, parabolic dish, Central Tower Collector). Advantages and Disadvantages; Solar Photovoltaic – Solar Cell fundamentals, module, panel and array. Solar PV Systems – Street lighting, Domestic lighting and Solar Water pumping systems. **Wind Energy:** Wind and its Properties, History of Wind Energy. Basic principles of Wind Energy Conversion Systems (WECS), Classification of WECS, Parts of a WECS, Derivation for Power in the wind, Advantages and Disadvantages of WECS	
UNIT – III	**(10L-0T Hours)**
Biomass Energy: Introduction, Photosynthesis process, Biomass conversion technologies; Biomass Gasification – Principle and Working of Gasifiers, Biogas - production of biogas, factors affecting biogas generation, types of biogas plants–KVIC and Janata model. **Geothermal Energy:** Introduction, Geothermal resources (brief description); Advantages and disadvantages; Applications of Geothermal Energy.	
UNIT – IV	**(10L-0T Hours)**
Energy from Ocean: Tidal Energy – Principle of Tidal Power, Components of Tidal Power Plant (TPP), Classification of Tidal Power Plants, Advantages and Limitation of TPP. **Ocean Thermal Energy Conversion (OTEC):** Principle of OTEC system, Methods of OTEC power generation – Open Cycle (Claude cycle), Closed Cycle (Anderson cycle) and Hybrid cycle (block diagram description of OTEC); Advantages and Limitation of OTEC. **Emerging Technologies:** Fuel Cell, Wave Energy. (Principle of Energy generation using block diagrams, advantages and limitations).	
Reference Books: 1. A Khan, B. H., Non-Conventional Energy Resources, TMH, New Delhi, 2006. 2. Rai, G. D., Non-Conventional Sources of Energy, IV- Edition, Khanna Publishers, New Delhi, 2007 3. Mukherjee, D., and Chakrabarti, S., Fundamentals of Renewable Energy Systems, New Age International Publishers, 2005. 4. Tiwari,G.N., and Ghosal,M.K., Renewable Energy Sources: Basic Principles and Applications, Alpha Science International, Ltd., New Delhi, 2006.	

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes

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

1. List and define various parameters and features of solar, wind, biomass, geothermal and ocean energy conversion systems.
2. Explain various concepts and theory related to solar, wind, biomass, geothermal and ocean energy conversion systems.
3. Evaluate/calculate various parameters related to solar and wind energy conversion systems.
4. Relate/articulate the concepts and theories related to solar, wind, biomass, geothermal and ocean energy conversion systems.

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE555N.1	3	1	1				1	1		1		1
2	UEE555N.2	3	1	1				2	1		1		1
3	UEE555N.3	3	2	1				2	1	1	1		1
4	UEE555N.4	3	3	3				2	1		1		2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE561L	Digital Signal Processing Laboratory	01 - Credits (0 : 0 : 1)
Hours/Week : 02		CIE Marks : 50
Total Hours : 26		SEE Marks : 50

List of Experiments

1. Generation of Unit step, ramp, exponential and sinusoidal signals
2. Convolution of two signals
3. To determine power and energy of the signals
4. To determine impulse response given y(n) and x(n)
5. To determine DTFT of given sequence
6. Circular convolution of two given sequences
7. Computation of N – point DFT of a given sequence and to plot magnitude and phase
8. Linear convolution of two sequence using DFT and IDFT
9. Circular convolution of two sequences using DFT and IDFT
10. Design and implementation of FIR and IIR fitter to meet given specifications.
11. Study of DSP starter kits (DSK)
12. Linear convolution Using DSK
13. Circular Convolution using DSK
14. Computation of N point DFT using DSK

Reference Books:

1. Digital Signal Processing Principle, algorithms and applications, 4th edition by Proakis, Pearson Education 2012
2. Digital Signal Processing by Sanjith K. Mithra Edition, 2013
3. Digital Signal Processing by Oppenheim, Pearson Education / PHI, 2015
4. Digital Signal Processing by Salivatanam, A Vallavaraj, Gnanapriya , TMH 2011

Course Outcomes:

After completion of the course the students will be able to:

1. Develop programs for generating basic signals
2. Analyze and execute programs for convolution, DFT, FFT, Impulse Response
3. Design and analyze the filters and draw inference with reference to theoretical values

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE661L.1	3	1	1		1	1					1	1
2	UEE561L.2	3	1	1	1	2						1	1
3	UEE561L.3	3	1	1	1	2						1	1

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE562L	Control System Laboratory	01 - Credits (0 : 0 : 1)
Hours/Week : 02		CIE Marks : 50
Total Hours : 26		SEE Marks : 50

List of Experiments

1. Determine time domain response of second order systems for step input and obtain performance parameters.
2. a) Experiment to draw the speed – torque characteristic of a A.C. servomotor.
   b) Experiment to draw the speed torque characteristic of a D.C. servomotor.
3. Design a passive RC lead compensating network for the given specifications, viz., the maximum phase lead and the frequency at which it occurs and to obtain its frequency response.
4. Study the synchro-transmitter and receiver and obtain output vs input characteristics.
5. Determine experimentally the frequency response of a second -order system and evaluation of frequency domain specifications.
6. Design RC lag compensating network for the given specifications. viz., the maximum phase lag and the frequency at which it occurs, and obtains its frequency response.
7. Experiment to draw the frequency response characteristic of a given lag- lead compensating network.
8. Design a PID controller and study its effect on steady state error.
9. Plot the root locus diagram of an open loop transfer function and determine range of gain 'k' for stability. Using MATLAB software
10. Plot a Bode diagram of an open loop transfer function. Using MATLAB software
11. Draw a Nyquist plot of an open loop transfers functions and examine the stability of the closed loop system. Using MATLAB software.

Reference Books:

1. Norman S. Nise "Control System Engineering", McGraw Hill, 2010.
2. Benjamin C. Kuo, "Automatic Control System", 7th Edition, PHI, 2010.
3. Richard C. Dorf Robert H. Bishop "Modern Control Systems", 8th Edition, Addison-Wesley,1999
4. Katsuhiko Ogata, Modern Control Engineering, Prentice–Hall of India Private Limited, 2001

Course Outcomes:

After completion of the course the students will be able to:

1. Analyze and verify experimental results of a toque- speed characteristic of DC and AC servomotor with the frequency response and time response analysis of a second order control system through conduction.
2. Analyze stability of the system through Root Locus, Bode plot and Nyquist plot. Using MATLAB
3. Analyze Lag, Lead, Lead-Lag compensators network and the effect of P, PI, PD and PID controllers on a control system verify experimental results through conduction.

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE662L.1	3	1	1		1	1					1	1
2	UEE562L.2	3	2	2	1	2						1	2
3	UEE562L.3	3	2	2	1	2	2					1	2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE563L	Analog and Digital Laboratory	01 - Credits (0 : 0 : 1)
Hours/Week : 02		CIE Marks : 50
Total Hours : 26		SEE Marks : 50

List of Experiments

1. Design and testing of diode clipping and clamping circuits.
2. Design of fixed bias and voltage divider bias circuits for BJT.
3. Design of RC coupled single stage BJT amplifier and determination of the gain, frequency response, input and output impedances.
4. Calculation of hybrid parameters of a CE transistor amplifier
5. Simplification, realization of Boolean expressions using logic gates /Universal gates. (i) Realization of Full adders and Full Subtractors using logic gates (ii) Realization of parallel adder/subtractors using 7483 chip
6. Realization of Binary to Gray Code conversion and vice versa.
7. MUX / DEMUX-use of 74153, 74139 for arithmetic circuits and code converters
8. Realization of One/Two bit comparator and study of 7485 magnitude comparator.
9. Truth table verification of Flip- Flops (i) JK Master slave (ii) T type and (iii) D type
10. Realization of 3 bit counters and MOD- N counter design (7490, 74193).
11. Shift left; Shift Right; SIPO, SISO, PIPO, PISO, operations using 74S95.
12. Ring counter and Johnson counter.

Reference Books:

1. Jacob Milliman, Christos C. Halkias, Chetan D. Parikh, Integrated Electronics-Analog and Digital Circuits and Systems, 2ndedition, Tata McGraw Hill Education Private Limited, New Delhi, 2015.
2. G. K. Mithall, Electronic Devices and Circuits, Khanna Publishers, New Delhi, 1998.
3. David A. Bell, "Operational Amplifier and Linear ICS", 3rdedition, Oxford, 2012.
4. Robert L. Boylestad, Louis Nashelsky, Electronic Devices and Circuits Theory, 9th edition, Pearson/Prentice Hall, India, 2006.

Course Outcomes:

After completion of the course the students will be able to:

1. Student should be able to select appropriate components and write the requirement table based on experiment
2. Student should be able to write the procedure, simplify the expressions using K-map and realize the circuit
3. Student should be able to rig-up the circuit and verify output

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE663L.1	3				1	1					1	1
2	UEE563L.2	3	1		1	2						1	2
3	UEE563L.3	3	2	2	1	2	2					1	2

Syllabus for B.E. V - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UHS002N	Advanced Quantitative Aptitude and Soft Skills	01 - Credits (1 : 0 : 0)
Hours/Week : 01		CIE Marks : 50
Total Hours : 15		SEE Marks : 50

UNIT – I	(06 Hours)
Quantitative and Reasoning Aptitude skills Training :- Speed Maths **,** Areas and Volumes, Concept Review, Number Series and Letter Series, Coding and Decoding, Concept Review	
UNIT – II	**(03 Hours)**
Verbal Aptitude Skills Training:- Reading Comprehension, Listening Comprehension, Concept Review	
UNIT – III	**(03 Hours)**
Career Skills:- Orientation to competitive exams, such as GATE, GRE, GMAT, CAT, UPSC, SSC, and Bank PO. Group Discussion – Simulation, Orientation to career paths, such as core engineering, IT engineering, public sector, banking, sales and marketing, and entrepreneurship	
UNIT – IV	**(03 Hours)**
Soft Skills:- Dressing and Grooming, Professional Etiquette, E-mail Writing	
Reference Books:- 1. Objective English - Arihant Publications 2. Data Interpretation - R.S Agarwal 3. Objective English Grammar - Kiran Publications	
Course Outcomes:- After completion of the course the students will be able to, 1. Improve verbal ability skills 2. Communicate effectively & appropriately in real life situation. 3. Enhance student's problem solving skill. 4. Prepare for various public and private sector exams & placement drives.	

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UHS002N.1	3	2	1					2		2	1	2
2	UHS002N.2	3	2	1					2		2	1	2
3	UHS002N.3	3	2	1					2		2	1	2
4	UHS002N.4	3	2	1					2		2	1	2

Syllabus for

B.E. VI - Semester

for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE651C	Power System Analysis and Stability	03 - Credits (2 : 2 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 52		SEE Marks : 50

UNIT – I	(8L-8THours)

Power System Representation: (4L-4T Hours)

Standard symbols of power system components, Single line diagram, Per unit system, Per unit impedance of 3 phase components, Change of base, Per unit impedance diagram, Advantages of per unit system calculations, Formation of Y- bus by inspection method-Numerical Problems

Symmetrical Three Phase Faults: (4L-4T Hours)

3 - phase short circuit at the terminals of unloaded generator, Sub transient, Transient and Steady state reactance, Transients on a transmission line, Short circuit currents and Reactance of synchronous machines on load and no load, Short circuit MVA-Numerical Problems

UNIT – II	(6L-6THours)

Symmetrical Components: (3L-3T Hours)

Definition of sequence components for 3-Phase unbalanced power systems, Operator "a" and its properties, Expressions for sequence components, Phase shift of symmetrical components in star delta transformer bank-Numerical Problems

Sequence Networks:(3L-3T Hours)

3- Ph power in terms of sequence components, voltage drop due to sequence currents, sequence impedance and sequence networks of power system elements (Alternator, Transformer and Transmission line), positive, negative and zero sequence networks of power system elements-Numerical Problems

UNIT – III	(6L-6THours)

Unsymmetrical Fault at the Terminals Unloaded Generator:(3L-3T Hours)

L-G, L-L, L-L-G fault with and without fault impedance at the terminals of unloaded generator- derivation for connection of sequence network and fault currents-Numerical Problems

Unsymmetrical Faults on Power Systems:(3L-3T Hours)

L-G, L-L, L-L-G faults on unloaded power systems, Open conductor faults in power system-Numerical Problems

UNIT – IV	(6L-6THours)

Stability Analysis: (3L-3T Hours)

Classification of Power System Stability, Steady Rotor dynamics, Swing equation, Power angle equation for salient and non salient pole synchronous machines-Numerical Problems

Equal Area Criterion:(3L-3T Hours)

Equal area criterion – Stability analysis for sudden change in mechanical input power, 3- ph fault on Generator terminals and on transmission line, Expression for critical clearing angle, Methods to improve stability of power system-Numerical Problems

Reference Books:

1. K. Uma Rao, "Computer Techniques and Models in Power Systems", 1st Edition, I. K. International publishing house, 2014.
2. Nagarath and Kothari, "Modern Power System Analysis", 3rd Edition, TMH, 2009.

3. W.D. Stevenson, “Elements of Power Systems Analysis”, 4th Edition, Mc.Graw Hill Publishers, 2013.
4. Hadi Saadat, “Power System Analysis”, TMH, Publishers, 4th Edition 2015.
5. V Neelakantan, "Power System Analysis & Stability”, Shiva Publishers, 2017

Course Outcomes:

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

1. Recall the procedure for drawing the reactance diagrams of power system network and advantages of per unit system representation
2. Illustrate the significance of fault analysis, sequence components and power system stability studies
3. Derive mathematical expressions for fault currents and rotor angle under different disturbance conditions and stability conditions
4. Make use of per unit system and sequence components to carry out symmetrical and unsymmetrical fault analysis

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE651C.1	3	1	1	1		1				1		1
2	UEE651C.2	3	2	1	1						1		1
3	UEE651C.3	3	2	2	2	1		1	1		1		1
4	UEE651C.4	3	3	3	2	1			1	1	1	1	2

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE652C	Microcontrollers	03 - Credits (3 : 0 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I	(10 Hours)

Microprocessors and Microcontrollers (4h):

Basics, Hexadecimal numbers, Hexadecimal addition, Block diagram of Computer, bus and Types of buses, memory address, Introduction of Microprocessors and Microcontrollers 8051, Features, Block diagram, pin diagram, program model, Architecture, PSW, PC, SP, Memory Organization

8051 Assembly Language Programming (2h):

Introduction to assembly language programming, assembling and running a program, The program counter and ROM space, data types and directives.

Addressing Modes (4h):

Introduction, Addressing modes, External Data Moves, Code Memory Read Only Data Moves, Indexed Addressing Mode, Programs, PUSH and POP Opcodes, programs, Data exchanges-Programs

UNIT – II	(10 Hours)

Logical and Arithmetic Operations (5h):

Introduction, Arithmetic instructions, incrementing and decrementing, Addition, subtraction, multiplication and division, decimal arithmetic-Programs, Byte level Logical instructions, Bit level logical instructions, Rotate and swap instructions, Programs

Jump and Call Instructions (5h):

The jump and call program range, jump and call instructions, machine cycle and time delays generation-Programs

UNIT – III	(10 Hours)

8051 I/O and Timer Programming (6h):

Introduction, I/O programming, I/O Bit Manipulation Programming.

Timers, programming timers 0 and 1 in 8051 assembly. Counter programming

8051 Serial Port and Interrupt Programming (4h):

Basics of serial communication, 8051 connections to RS-232, Serial port programming in 8051 assembly, Introduction to interrupts

UNIT – IV	(6L-6THours)

8051 Interfacing and Applications (5h):

Interfacing 8051 to LCD, parallel ADC0809, serial ADC MAX1112, DAC, Stepper motor

Programming in C for 8051(4h):

Introduction, Programming in C for 8051: data types, Programs on time delays, I/O programming,

Reference Books:

1. Digital Signal Processing Principle, algorithms and applications, 4th edition by Proakis, Pearson Education 2012
2. Kenneth J. Ayala, "The 8051 Microcontroller Architecture, Programming and Applications" 3rd edition, Cengage, 2007.
3. Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay; "The 8051 Microcontroller and Embedded Systems using assembly and C", 2nd edition, Pearson,

2012.

4. David Calcutt Fred Cowan, Hasan Parchizadeh Elsecier, "8051 Microcontrollers an application based introduction",2004
5. Myke Predko, "Programming and Customizing the 8051 Microcontroller", TMH, 1999, 15th Reprint, 2008.
6. Ajay V. Deshmukh; "Microcontrollers-Theory and Applications", TMH, 2005.
7. Ramani Kalpathi and Ganesh Raja, "Microcontroller and its applications", 1st revised edition Sanguine Technical publishers, Bangalore-2007.

Course Outcomes:

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

1. List and define the features of microcontrollers, instruction set, peripheral devices, addressing modes
2. Illustrate and explain architecture of microcontroller, functions of registers, pins, addressing modes, directives, programming instructions, interrupts, and peripheral devices
3. Identify the instructions/addressing modes, codes for selecting register banks/timer registers and to make use of appropriate instructions for programs and delay calculation Create, inspect & debug the assembly language instructions/program and re-correct code & assess number of bytes
4. Formulate the flowchart & develop assembly level/8051C programme for given application, Design, construct the interfacing circuit and develop programme with microcontroller 8051 for given application

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE652C.1	3	3	3	3	3	1	1	1	1	2	2	3
2	UEE652C.2	3	3	3	3	3	1	1	1	1	2	2	3
3	UEE652C.3	3	3	3	3	3	1	1	1	1	2	2	3
4	UEE652C.4	3	3	3	3	3	1	1	1	1	2	2	3

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE653H	Management and Entrepreneurship	03 - Credits (3 : 0 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours :40		SEE Marks : 50

UNIT – I	10 Hours

1. Introduction:

Management: Science, Theory and Practice, Managing; Science and Art? The Functions of Managers, Levels of management, the Systems Model of Management, Management and Society, Social Responsibility and Ethics.

2. Planning:

The Nature and Purpose of Planning, Types of Plans, Steps in Planning, The planning Process, Objective, Management by Objectives, Strategies Policies, and planning Premises, The Strategic planning Process, Effective Implementation of Strategies, Premising and Forecasting, Decision Making the importance and Limitations of Rational Decision Making. Types of Decision making.

3. Organizing:

The nature and Purpose of Organizing, Formal and Informal Organization, Organizational Division : The Department, Organization Level and the Span of Management, The Structure and Process of Organizing , Effective organizing, Basic Departmention, Matrix Organization Strategic Business Units, Line / Staff Authority and Decentralization of Authority and Power, Line and Staff concepts, Functional Authority, Decentralization of Authority , Delegation of Authority, Promoting and Appropriate Organization Culture.

UNIT – II	10 Hours

4.Staffing :

The System Approach to human Resource Management: An overview of the Staffing Function, Situational Factors affecting Staffing, Selection Process, Techniques and Instruments, Orienting and Socializing New Employees.

5.Motivation and Leading:

Motivation : Meaning, importance, , Theories of motivation (Maslow's need theory, Expectancy theory, Alderffer's ERG, Two factor (hygiene) and Goal setting theory), Motivational Techniques. Leadership: Meaning, Ingredients of Leadership, Leadership Behaviour and Styles, Contingency Approaches to Leadership.

UNIT – III	10 Hours

6.Communication

Communication, The Communication Function in Organizations, The Communication Process, Communication in the Enterprise, Barriers and Breakdowns in Communication, Toward Effective Communication.

7.Controlling

The System and Process of Controlling, Control as a Feedback System, Feed forward control, Requirements for Effective Controls, Control Techniques and information Technology Control Techniques: The Budget, Traditional Non budgetary Control, Information Technology, Productivity and Operation, Direct control versus Preventive Control.

UNIT – IV	10 Hours

8.Entrepreneurship

Meaning of Entrepreneur, Evaluation of the Concept, Functions of an Entrepreneur, Types of

Entrepreneur, Intrapreneur - an Emerging Class, Concept of Entrepreneurship, steps in entrepreneurial process, Role of entrepreneurs in Economic Development; Entrepreneurship in India, Entrepreneurship — Barriers.

9.Micro Small and Medium Enterprises (MSME): Definition: Characteristics : Need and rational ; Objectives; Scope; role of MSME in Economic Development. Advantages of MSME, steps to start an MSME — government policy towards MSME; Impact of Liberalization, Privatization, Globalization MSME, Effect of WTO / GATT

10. Institutional Support: Diflerent Schemes: TITSOK, KIADB, KSSIDC, KSIMC, DIc Single window Agency ; MSME, NISC; SIDBI, KSFC.

11. Preparation of Project: Meaning of Project, Project Identification, Project Report Contents; Formulation; Project Appraisal Identification of Business Opportunities; Market Feasibility Studies; Technical Feasibility Studies; Financial Feasibility Studies and Social Feasibility Studies (in brief).

Reference Books:

1. Fremont E. Kast, James E Rosenzweig, Organization and Management, McGraw-Hill, 2nd Edition.
2. Tripati and Reddy, Principales of Management, TMH, 4th Edition, ISBN: 9780070220881, 2010.
3. Entrepreneurship Development – S. S. Khanka – S. Chand and Co.
4. Entrepreneurship Development – Small Business Enterprises - Poornima M. Charantimath – Pearson Eduction - 2006. 5th - Edition 2009..
5. David H.Holt, Entrepreneurship ; New Venture Creation, Prentice Hall, 1991, ISBN – 10:0132826747
6. Peter F Drucker - Innovation and Entrepreneurship, Harper Collins Publication, 1993, ISBN: 13:978-0-06-085113-2

Course Outcomes:

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

1. Students should be able to explore and apply the basic concepts of Management and apply the principles of management.
2. Students should be able to apply the entrepreneurial qualities and skill under real world practical conditions.
3. Students should be able to analyze the functions of management and entrepreneurship and apply them to practical situations.
4. Students should be able to ascertain various channels provided by government of India to initiate business enterprise.

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE653H.1	3							1		1		1
2	UEE653H.2	3	1						1		1		1
3	UEE653H.3	3	3	2	2	1			1		1		1
4	UEE653H.4	3	3	3	3	1			1	1	1		2

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE654E	**Modern Control Theory**	**03 - Credits (3 : 0 : 0)**
Hours/Week : 03		**CIE Marks : 50**
Total Hours :40		**SEE Marks : 50**

UNIT – I	**(10 Hours)**
State Variable Analysis and Design: Introduction, state space representation using physical variable, phase variable and canonical variables. **Derivation of transfer function from state model:** Diagonalization, Eigen values, Eigen vectors, Solution of state equations.	
UNIT – II	**(10 Hours)**
Solution State of Transition Matrix: Solution of state equation, state transition matrix and its properties, computation using Laplace transformation, power series method, Cayley- Hamilton method, concept of controllability and observability methods. **Pole Placement Techniques:** Stability improvements by state feedback, necessary and sufficient condition for arbitrary pole place placement	
UNIT – III	**(10 Hours)**
Design of Controllers: Introduction and Design of Proportional (P), Integral (I), Differential (D), PI, PD and PID **Design of Compensators:** Lead compensator, Lag compensator and Lag-lead compensator using frequency domain.	
UNIT – IV	**(10 Hours)**
Non-Linear Systems: Introduction behavior of non linear system common physical non-linearly - saturation, friction, backlash, dead zone, relay multivariable non linearity. Phase plane method singular points stability of nonlinear system. **Liapunov Stability Criteria:** Liapunov function, direct method of Liapunov and the linear system, Hurwitz criterion and Liapunov's direct method, construction of Liapunov functions for non linear system by Krasvskii's method.	
Reference Books: 1. Benjamin C. Kuo and Farid Golnaraghi, "Automatic Control Systems", VIII- edition, John Wiley and Sons, 2003. 2. Nagoor Kani, "Advanced Control Theory" 2nd Edition RBA Publications 2014. 3. Parvatikar K, "Modern control Theory" 1st Edition, PRISM Publications, 2016.	
Course Outcomes: After completion of the course the students will be able to, 1. Analyse both linear and nonlinear system using state space methods. 2. Compute eigen values & eigen vectors in state equation and Solve the Solution of state equation, state transition matrix and its properties. 3. Design the controller, compensators and state regulator observer using system parameters. 4. Analyze stability improvements by state feedback, state observer and Liapunov criteria.	

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE654E.1	3	3	3	1	3	--	--	1	--	--	--	2
2	UEE654E.2	3	3	3	1	2	--	--	1	--	--	--	2
3	UEE654E.3	3	3	3	1	3	--	--	1	--	--	--	2
4	UEE654E.4	3	3	3	1	3	--	--	1	--	--	--	2

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE656N	Fundamentals of Wind Energy Conversion Systems	03 - Credits (3 : 0 : 0)
Hours/Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I	(10L-0T Hours)
Introduction: Historical Development (BC – 20th Century); Historical Development (20th Century – 1980s); Recent Developments (1980s – present); The Nature of the Wind, origin of wind; Wind Energy Potential; Offshore Wind Energy; Modern Wind Turbines; Wind Vs Conventional power generation.	
UNIT – II	**(10L-0T Hours)**
Wind Resource Assessment: Introduction – Spatial variation, Time variation; Characteristics of steady wind; Weibull wind speed distribution function; Vertical profiles of steady wind; Wind rose; Energy content of wind; Resource assessment.	
UNIT – III	**(10L-0T Hours)**
Aerodynamics: Introduction; Aerofoil – Two dimensional theory ,Relative wind velocity, Stall control; Wind flow models – Wind flow pattern; Axial momentum theory; Momentum theory for rotating wake; Blade element theory, Strip theory; Tip losses and correction; Wind Machine Characteristics.	
UNIT – IV	**(10L-0T Hours)**
Wind Turbines: Introduction; Classification of Wind Turbines; Wind Turbine Components; Basic principles of wind energy extraction; Extraction of wind turbine power(Numerical problems)- Weibull distribution-Wind power generation curve-Betz's Law-Modes of wind power generation.	

Reference Books:

1. Siraj Ahmed, Wind Energy- Theory and Practice, Prentice Hall of India, New Delhi,2010
2. D. P. Kothari, S. Umashankar, Wind Energy Systems and Applications, Narosa publishers,2017
3. Khan B. H., Non-Conventional Energy Resources, Tata McGraw Hill, 2009.

Course Outcomes

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

1. list and define various parameters and features of wind energy conversion systems.
2. Explain various concepts and theory related to wind energy conversion systems.
3. Evaluate/calculate various parameters related to wind energy conversion systems.
4. Relate/articulate the concepts and theories related to wind energy conversion systems.

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE656N.1	3	1	1				1	1		1		1
2	UEE656N.2	3	1	1				2	1		1		1
3	UEE656N.3	3	2	1				2	1	1	1		1
4	UEE656N.4	3	3	3				2	1		1		2

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE661L	Microcontrollers and IoT Laboratory	01 - Credits (0 : 0 : 1)
Hours/Week : 02		CIE Marks : 50
Total Hours : 26		SEE Marks : 50

List of Experiments

Part A - Assembly Language Programming

1. Addition of two 8 bit numbers, 16 bit numbers, array of 8 bit numbers, average of an array
2. Subtraction of two 8 bit numbers, 16 bit numbers
3. BCD Addition- two digit numbers, 4 digit numbers
4. Multiplication, Division
5. Arranging an array of number in ascending/descending order
6. To find maximum/minimum number of an array
7. Block of data transfer- Internal RAM, Internal RAM to external RAM
8. To find number of positive and negative numbers in an array
9. Code Conversion-BCD to Hex, Hex to BCD
10. Counters-Binary, BCD

Part B-IOT Programming

1. Familiarization with Arduino/Raspberry Pi and perform necessary software installation.
2. To interface LED/Buzzer with Arduino Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds
3. To interface Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.
4. To interface DHT11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.
5. To interface motor using relay with Arduino/Raspberry Pi and write a program to turn ON motor when push button is pressed.
6. To interface DISPLAY with Arduino/Raspberry Pi and write a program to print temperature and humidity readings on it.
7. To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to smart phone using Bluetooth
8. To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when I'/'O' is received from smartphone using Bluetooth.
9. Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to Thingspeak cloud
10. Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from Thingspeak cloud
11. To install MySQL database on Raspberry Pi and perform basic SQL queries.
12. Write a program on Arduino/Raspberry Pi to publish temperature data to MQTT broker
13. Write a program on Arduino/Raspberry Pi to subscribe to MQTT broker for temperature data and print it.
14. Write a program to create TCP server on Arduino Raspberry Pi and respond with humidity data to TCP client when requested.
15. Write a program to create UDP server on Arduino Raspberry Pi and respond with humidity data to UDP client when requested.

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Reference Books:

1. Kenneth J. Ayala, "The 8051 Microcontroller Architecture, Programming and Applications" 3rd edition, Cengage, 2007.
2. Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay; "The 8051 Microcontroller and Embedded Systems using assembly and C", 2nd edition, Pearson, 2012.
3. David Calcutt Fred Cowan, Hasan Parchizadeh Elsecier, "8051 Microcontrollers an application based introduction", 2004.

Course Outcomes:

After completion of the course the students will be able to:

1. Develop and verify Assembly Language Programes for the specified applications
2. Analyze and execute the Assembly Language Programes in Microcontroller kit
3. Interface and analyze the functioning of peripheral devices with microcontroller

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE661L.1	3	1	1		1	1					1	1
2	UEE561L.2	3	1	1	1	2						1	1
3	UEE561L.3	3	1	1	1	2						1	1

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE662L	Electrical AutoCAD Laboratory	01 - Credits (0 : 0 : 1)
Hours/Week : 02		CIE Marks : 50
Total Hours : 26		SEE Marks : 50

List of Experiments

1. Installation and Basic Commands of Auto CAD package
2. Drawing the basic diagrams for familiarization with Auto CAD
3. Drawing the cross sectional elevation of XLPE cable
4. Drawing the line diagram of DOL and Star – Delta starter
5. Drawing the half sectional elevation of pin insulator
6. Drawing the single line diagrams of a substations for the specified incoming and outgoing components
7. Development and drawing of Simplex, Single layer Progressive Lap winding for DC machine with specified details
8. Development and drawing of Simplex, Single layer retrogressive Lap winding for DC machine with specified details
9. Development and drawing of Simplex, Double layer progressive Lap winding for DC machine with specified details
10. Development and drawing of Duplex, Single layer progressive Lap winding for DC machine with specified details
11. Development and drawing of Simplex, Single layer Progressive Wave winding for DC machine with specified details
12. Development and drawing of Simplex, Double layer Progressive Wave winding for DC machine with specified details
13. Development and drawing of Simplex, Single layer retrogressive Wave winding for DC machine with specified details
14. Drawing the layout of residential and workshop plans
15. Drawing the Assembly of single phase and three phase core type transformer
16. Drawing the Assembly of Rotor, Stator of DC Generator and Alternator Assembly domain specifications.

Reference Books:

1. Devalapur, S F, “Textbook of Electrical Drafting”, 7th Edition, Eastern Book Promoters, Belgaum, 2006
2. A.K. Sawhney, A Course in Electrical Machine Design, Dhanpat Rai & Co. (P) Limited (2017), ISBN-10: 8177001019, ISBN-13: 978-8177001013.
3. Mittle V.N., Arvind Mittal, Design of Electrical Machines, Standard Publishers Distributors (2009), ISBN-13: 978-81-8014-126-3, ISBN: 81-8014-126-8.

Course Outcomes:

After completion of the course the students will be able to:

1. Identify the tools and commands in the AutoCAD software
2. Draw and develop the engineering diagrams of the specified electrical components as per the proposed scale
3. Analyze the constructional details of electrical devices and components

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE662L.1	3	1	1		3	1					1	1
2	UEE562L.2	3	2	2	1	3	1					1	2
3	UEE562L.3	3	2	2	1	3	2					1	2

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UEE665P	Mini Project	02- Credits (0 : 0 : 4)
Hours/Week : 0L+4P		CIE Marks : 50
Total Hours : 48		SEE Marks : 50

Mini project is an important integral part of BE (E&EE) program. Mini project is outcome of 3 years of engineering program and is expected to test the learning skills of a student. It reflects quality of teaching-learning process in the department. Mini Project helps students to explore and strengthen the understanding of fundamentals through practical application of theoretical concepts. Mini Project will boost student's skills and widen their horizon of thinking. It acts like a beginners guide to do larger projects later in their career.

Course Outcomes

After undergoing the internship, students will be able to:

1. Identify engineering problems associated with electrical & electronics engineering and interdisciplinary research.
2. Analyze Data and interpret contemporary tools & resources to analyze / validate the solutions for engineering problems.
3. Communicate effectively and present the work to technical audience.
4. Prepare quality technical report with detailed analysis and representation of the executed work.

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UEE665P.1	3			3					3			3
2	UEE665P.2		3	3		3	3						3
3	UEE665P.3	3	3	3	2	2	1				3		3
4	UEE665P.4	2	1								3		3

Syllabus for B.E. VI - Semester for academic year 2022 – 2023

(For students admitted to I year in 2020-21)

UHS003N	Career Planning & Professional Skills	01 - Credits (1 : 0 : 0)
Hours/Week : 01		CIE Marks : 50
Total Hours : 15		SEE Marks : 50

UNIT – I	(06 Hours)
Quantitative and Reasoning, Aptitude Skills Training: Number Properties, Percentages, Linear and Circular Arrangement Order and Rank	
UNIT – II	**(03 Hours)**
Verbal Aptitude Skills Training:- Reading Comprehension, Listening Comprehension, Concept Review	
UNIT – III	**(03 Hours)**
Career Skills:- Orientation to competitive exams, such as GATE, GRE, GMAT, CAT, UPSC, SSC, and Bank PO. Group Discussion – Simulation, Orientation to career paths, such as core engineering, IT engineering, public sector, banking, sales and marketing, and entrepreneurship	
UNIT – IV	**(03 Hours)**
Soft Skills: Six-Step Planning Process, Problem Solving through Design Thinking, Conflict Resolution through Assertiveness and Cooperation, Matrix, Confidence through Body Language & Preparing and Delivering a Presentation, Self-Motivation	

Reference Books:-

1. Master Guide, “Verbal Ability”, Ethnus Consultancy Services Pvt Ltd., 2018.
2. Master Guide, “Quantitative Aptitude”, Ethnus Consultancy Services Pvt Ltd., 2018.
3. Master Guide, “Verbal Ability”, Ethnus Consultancy Services Pvt Ltd., 2018.
4. Learner’s Notes, “Goal Setting”, Ethnus Consultancy Services Pvt Ltd., 2018.
5. Learner’s Notes, “Motivation”, Ethnus Consultancy Services Pvt Ltd., 2018.

Course Outcomes:-

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

1. Imbibe a high level of Think, decide and act according to the needs and demands of the current situation.
2. Fix the errors in coding by the various strategies of analytical and reasoning techniques
3. Clear the aptitude and general interviews by soft skills
4. Apply suitable soft skills in their career

Course Outcomes - Programme Outcomes Mapping Table

Sl.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	UHS003N.1	2	1	1		1	1	1		1	1	2	1
2	UHS003N.2	2	1	1	1			1	1	2	1	1	1
3	UHS003N.3	2	1	2	2			1	1	1	1	1	1
4	UHS003N.4	2	1	3	3			1	1	1		2	2