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Pedatadepalli, **TADEPALLIGUDEM – 534 101,** W.G. Dist, (A.P.)

Department of Electrical and Electronics Engineering

Date: 23-04-2019

The second meeting of Board of Studies in Department of Electrical and Electronics Engineering is held on 20/04/2019 at 10.00 AM in the Computer Lab of EEE Department.

The following members are attended the meeting.

S.No.	Name	Designation	Role
1.	Dr. Sudha Rani Donepudi	Associate Professor, Head, Dept. of EEE, SVEC, Pedatadepalli.	Chairperson
2.	Dr. R. Srinivasa Rao	Professor, Dept. of EEE, UCEK, JNTUK, Kakinada	Subject Expert Nominated By V.C.
3.	Dr. M. Sydulu	Professor, Dept. of EE, NITW, Warangal	Subject Expert Nominated By A.C.
4.	Er. B.N.V.R.C. Suresh Kumar	Retired AGM, PGCI, Hyderabad	Industry Expert Nominated By A.C
5.	Er. Ch. Vinay Kumar	Assistant Engineer, EHT Lines, APTRANSCO, Eluru.	Alumni
The faculty members			
6.	Dr. Ch. Rambabu	Professor	Member
7.	Dr. P.V.V. Rama Rao	Professor	Member
8.	U. Chandra Rao	Sr. Asst. Professor	Member
9.	N. Sri Harish	Asst. Professor	Member
10.	Ch. V.S.R. Gopala Krishna	Sr. Asst. Professor	Member
11.	K. Ramesh Babu	Asst. Professor	Member
12.	G. Anand Kumar	Asst. Professor	Member
13.	P.S.V.N. Sudhakar	Asst. Professor	Member
14.	L. Janardhana Rao	Asst. Professor	Member
15.	K. Suresh	Asst. Professor	Member
16.	M.T.V.L. Ravi Kumar	Asst. Professor	Member

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17.	V. Rama Narayana	Asst. Professor	Member
18.	Chandra Babu Guttikonda	Asst. Professor	Member
19.	Sudhir Mallampati	Asst. Professor	Member
20.	B. Prasad Reddy	Asst. Professor	Member
21.	G. Madhu Sagar Babu	Asst. Professor	Member
22.	G. Govardhan	Asst. Professor	Member
23.	P.K.S. Sarvesh	Asst. Professor	Member
24.	A. Uma Siva Naga Prasad	Asst. Professor	Member
25.	K. Venkata Reddy	Asst. Professor	Member
26.	B. Swamy	Asst. Professor	Member
27.	G. Saveen	Asst. Professor	Member
28.	D.V. Manikanta	Asst. Professor	Member

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Department of Electrical and Electronics Engineering

The following are the minutes of the meeting

- Chairperson welcomed all the BOS members.

Item No. 1: Review of course structure of III & IV semesters for UG (B.Tech-EEE) Programme of Academic Year 2019-20.

- Reviewed the course structure of III & IV semesters for UG (B.Tech-EEE) Programme for the Academic Year 2019-20 and following modifications have been done.

III Semester

- Thermal and Hydro Prime Movers (THPM) Theory (Course Code: V18MET12) and Laboratory (Course Code: V18MEL06) courses are replaced with **Data Structures & Algorithms Lab (**Course Code: **V18CSL31)**.
- Professional Ethics course (Course Code: V18ENT07) is renamed as **Professional Ethics and Human Values (**Course Code: **V18ENT12)**.
- English BOS has renamed the titles of mandatory Courses Employability Skills-I (Course Code: V18ENT03) to Professional Communication Skills-I (Course Code: **V18ENT03**)

IV Semester

- Power Systems – I Course (Course Code: V18EET08) **and** Power Systems – II (Course Code: V18EET10) are merged and titled as **Electrical Power Generation and Transmission (**Course Code: **V18EET10).**
- Electrical Circuits Laboratory course (Course Code: V18EEL02) and Electrical Measurements Laboratory (Course Code: V18EEL04) are merged and titled as **Electrical Circuits & Measurements Laboratory (**Course Code: **V18EEL04).**
- **Python Programming Laboratory (**Course Code: **V18CSL33)** is introduced.
- Electrical Safety Awareness course (Course Code: V18EET56) title is modified as **Electrical Safety & IE Rules (**Course Code: **V18EET11).**
- English BOS has renamed the titles of mandatory Courses Employability Skills-II (Course Code: V18ENT04) to Professional Communication Skills-II (Course Code: **V18ENT04**)

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Department of Electrical and Electronics Engineering

The details of the course structure for UG (B.Tech) Programme (EEE) are given in Annexure-I

Item No. 2: Propose syllabi for the courses offered in III and IV semesters of B.Tech programme of Academic Ycar 2019-20.

The proposed syllabi for the courses offered in III and IV semesters of B.Tech programme of Academic Year 2019-20 is attached in Annexure-II.

Item No. 3: Result Analysis of the courses offered in I semester.

- Reviewed and apprised the results of the courses offered by EEE Department in I semester.

Results are given in Annexure-III

Dr. Sudha Rani Donepudi
(BOS Chairperson)

Dr. Sudha Rani Donepudi, M.E., Ph.D
Head of the Department
Electrical & Electronics Engineering
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Annexure-I

PROPOSED COURSE STRUCTURE FOR UG-B.TECH PROGRAMME (EEE) III & IV SEMESTERS UNDER AUTONOMY

III Semester						
S.No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1.	V18EET03	Electrical Circuit Analysis - I	3	1	-	4
2.	V18ECT05	Analog Electronics	3	-	-	3
3.	V18EET04	Electrical Machines – I	3	1	-	4
4.	V18EET05	Electro Magnetic Fields	3	1	-	4
5.	V18EET06	Electrical and Electronic Measurements	3	-	-	3
6.	V18CSL31	Data Structures & Algorithms Lab	-	-	6	3
7.	V18ECL03	Analog Electronics Laboratory	-	-	2	1
8.	V18ENT12	Professional Ethics & Human Values	2	-	-	MNC
9.	V18ENT03	Professional Communication Skills– I	3	-	-	MNC
		Total Contact Hours	**29**			**22**
IV Semester						
S.No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1.	V18EET07	Electrical Circuit Analysis -II	3	1	-	4
2.	V18EET08	Digital Electronics	3	-	-	3
3.	V18EET09	Electrical Machines – II	3	1	-	4
4.	V18MAT04	Probability &Statistics	3	1	-	4
5.	V18EET10	Electrical Power Generation and Transmission	3	-	-	3
6.	V18EEL04	Electrical Circuits & Measurements Laboratory	-	-	2	1
7.	V18EEL05	Electrical Machines Laboratory - I	-	-	2	1
8.	V18CSL33	Python Programming Lab	-	-	2	1
9.	V18EET11	Electrical Safety & IE Rules	2	-	-	MNC
10.	V18ENT04	Professional Communication Skills– II	3	-	-	MNC
		Total Contact Hours	**29**			**21**

Internship/Industrial Training – Enrolment of Internship/Industrial Training will be initiated at the end of IV Semester.

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Annexure-II

SYLLABI FOR THE COURSES OFFERED FOR UG B.TECH (EEE) PROGRAMME IN III & IV SEMESTERS

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: III**
Course Code : V18EET03
Course Name : Electrical Circuit Analysis – I **[L : 3; T:1; P : 0 (4 credits)]**
Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C201.1	Apply various network reduction techniques for solving electrical circuits.	K3
C201.2	Apply the principles of magnetism for solving different kind of magnetic circuits with and without dot conventions.	K3
C201.3	Calculate different parameters of single phase alternating quantities.	K3
C201.4	Determine various parameters in series and parallel resonant circuits.	K3
C201.5	Apply the network theorems for solving electrical circuits.	K3
C201.6	Calculate two-port network parameters for any type of electrical networks	K3

Unit-I: Introduction to Electrical Circuits

Classification of network elements, electric charge and current, electric energy and potential, Resistance parameter – Ohm's Law - series and parallel combination; Inductance parameter – series and parallel combination; Capacitance parameter – series and parallel combination; Energy Sources - Ideal, Non-Ideal, Independent and Dependent sources; Kirchhoff's laws; Source transformation; Y-Δ and Δ-Y transformation; Mesh analysis and Nodal analysis - problem solving for the network consisting of independent and dependent sources.

Unit-II: Magnetic Circuits

Basic definitions of MMF, Flux and Reluctance; Analogy between electrical and magnetic circuits; Analysis of series, parallel and composite magnetic circuits; Faraday's laws of electromagnetic induction; Concepts of self-inductance, mutual inductance and coefficient of coupling; Concept of Dot Convention and coupled coils.

Unit-III: Single Phase A.C Systems

Definitions of basic terms associated with periodic functions: Time period, Angular velocity and frequency, RMS value, Average value, Form factor and peak factor - numerical problems**;** Concept of phase angle and phase difference – Waveforms and phasor diagrams for lagging, leading networks; complex and polar forms of representations, steady state analysis of series and parallel combinations of R, L and C circuits; Power Factor and its significance; Concepts of Real, Reactive, Apparent and Complex Powers; Waveforms of instantaneous voltage, current and power; Power triangle.

Unit-IV: Analysis of AC Networks & Resonance

Extension of node and mesh analysis to AC networks; Numerical problems on sinusoidal steady state analysis; Concept of Resonance **-** Series and parallel resonance, Bandwidth of series and parallel resonance, Quasi factor, Selectivity; Numerical problems; Introduction to locus diagrams.

Unit-V: Network Theorems (DC & AC Excitations)

Superposition, Thevenin's, Norton's, Milliman's, Reciprocity, Compensation, Maximum Power Transfer, Tellegen's theorems; problem solving for the network consisting of independent and dependent sources. Concept of Duality and Dual networks.

Unit-VI: Two-Port networks

Basic Definitions; Z-parameters; Y-parameters; Transmission line (ABCD) parameters; h-parameters; Relationship between parameter sets; Series, Parallel and Cascade connections of two port networks; problem solving for the network consisting of independent and dependent sources.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw Hill Company,6 th edition
2. Network Analysis by Van Valkenburg, Prentice-Hall of India Private Ltd
3. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, Dhanpat Rai & Co.

Reference Books:

1. Fundamentals of Electrical Circuits by Charles K.Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India)

2. Network Analysis by C.L.Wadhwa, New Age International Publishers.
3. Electric Circuits– (Schaum's outlines) by Mahmood Nahvi & Joseph Edminister, Adapted by Kuma Rao, 5th Edition – McGraw Hill.
4. Electrical Circuit Analysis by Sudhakar A. & Shyammohan S.Palli, Mc Graw Hill Publication
5. Introductory Circuit Analysis by Robert L Boylestad, Pearson Publications

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: III**
Course Code : V18EET04
Course Name : Electrical Machines – I **[L : 3; T:1; P : 0 (4 credits)]**

Course Outcomes

After Successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C203.1	Understand the basic fundamentals of electromechanical energy conversion and various DC machines	K2
C203.2	Predict and mitigate the ill-effects of armature reaction and improve commutation in dc machines	K3
C203.3	Understand the torque production mechanism and control the speed of dc motors	K2
C203.4	Analyze the performance of single phase transformers	K4
C203.5	Calculate the regulation, losses and efficiency of single phase transformers	K3
C203.6	Understand the parallel transforms, control voltages with tap changing methods and achieve three phase to two phase transformation	K2

Unit-I: Introduction to DC machines

Principles of electromechanical energy conversion; Construction and principle of operation of DC machine; EMF equation of DC generator; Classification of DC machines based on excitation; Magnetization Characteristics of DC shunt generator.

Unit-II: Performance of D.C. Machines

Torque and back-emf equations of dc motor; Armature Reaction and Commutation; Characteristics of separately-excited, shunt, series and compound motors; losses and efficiency of a DC machine; Applications of DC motors.

Unit-III: Starting, Speed Control and Testing of D.C. Machines

Necessity of Starter - Working of 3-Point and 4-Point Starters; Speed Control of DC shunt motor by armature voltage and field flux control; Testing of DC machines - Brake Test, Swinburne's method, Hopkinson's Test, Retardation Test; Simple Numerical Problems.

Unit-IV: Single-phase Transformers

Types, Constructional details, Principle of operation, EMF Equation of a 1-Φ Transformer; Transformer operation on No-Load and On-Load for lagging, leading and unity power factors loads and their phasor diagrams; Transformer equivalent circuit; Transformer Regulation, Losses and efficiency; effect of variation of supply frequency and voltage on losses; All day efficiency.

Unit-V: Testing of Single-phase Transformers

O.C. and S.C. tests; Sumpner's test; Separation of losses of a 1-Φ transformer; Parallel operation with equal voltage ratios; Auto Transformer - equivalent circuit, comparison with two winding transformers.

Unit-VI:-III-Phase Transformers

Poly-phase connections, Y/Y, Y/Δ, Δ/Y, Δ/Δ and open-Δ; Scott Connection; Three winding Transformer: Determination of Z_p, Z_s and Z_t; Off-load and On-load tap changers.

Text Books

1. Electrical Machines by P.S. Bhimbra, Khanna Publishers.
2. Theory & Performance of Electrical Machines by J.B.Guptha. S.K.Kataria & Sons.

Reference Books

1. Electrical Machines by D. P.Kothari, I .J .Nagarth, Mc GrawHill Publications, 4th edition
2. Electrical Machines by R.K.Rajput, Lakshmi publications, 5th edition.
3. Electrical Machinery by Abijith Chakrabarthi and Sudhipta Debnath, McGraw Hill Education 2015
4. Electrical Machinery Fundamentals by Stephen J Chapman, McGraw Hill education 2010
5. Electric Machines by Mulukutla S.Sarma & Mukesh k.Pathak, CENGAGE Learning.
6. Electric Machinery by A.E.Fitzgerald, Charles kingsley,Stephen D.Umans, TMH

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: III**
Course Code : V18EET05
Course Name : Electro Magnetic Fields **[L : 3; T:1; P : 0 (4 credits)]**

Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C204.1	Compute the electric field and potential due to different configurations of static charges and electric dipole.	K3
C204.2	Calculate the capacitance of various configurations and understand the concept of conduction and convection current densities.	K3
C204.3	Apply the Biot-Savart's law for finding MFI for different cables and develop the Maxwell's second equation.	K3
C204.4	Compute MFI for different cables by applying Ampere's circuital law and develop the Maxwell's third equation.	K3
C204.5	Determine the magnetic forces, torque produced by currents in magnetic fields, self-inductance of solenoid and toroid.	K3
C204.6	Calculate the induced E.M.F's and understand the concept of fileds varying with time.	K3

Unit-I: Electrostatics

Electrostatic Fields; Coulomb's Law; Electric Field Intensity (EFI) - EFI due to a line and a surface charges; Work done in moving a point charge in an electrostatic field; Electric Potential - Properties of potential function, Potential gradient; Guass's law; Maxwell's first law, div(D)=ρ_v; Laplace's and Poison's equations; Electric dipole - Potential and EFI due to an electric dipole, Torque on an Electric dipole placed in an electric field.

Unit-II: Conductors, Dielectrics and Capacitance

Conductors & Dielectrics: Conductors - Behavior of conductors in an electric field; Insulators - Polarization; Electric boundary conditions;

Capacitance: Capacitance of parallel plates, spherical and coaxial cables with composite dielectrics; Energy density in a static electric field; Current density - Conduction and Convection current densities; Ohm's law in point form, Equation of continuity.

Unit-III: Magneto Statics-I

Introduction to static magnetic fields; Biot-Savart's law; Magnetic Field Intensity (MFI) - MFI due to a straight current carrying filament, circular, square and solenoidal current carrying wires; Maxwell's second Equation, div(B)=0.

Unit-IV: Magneto Statics-II

Ampere's circuital law - MFI due to an infinite sheet of current, long filament current carrying conductor, circular, rectangular and square loops; Point form of Ampere's circuital law; Maxwell's third equation, Curl (H)=J.

Unit-V: Forces in Magnetic fields and Inductance

Magnetic force; Behavior of charges moving in magnetic field; Lorentz force equation; Force on a current carrying element placed in a magnetic field; Force on a straight and a long current carrying conductor placed in a magnetic field; Force between two straight long and parallel current carrying conductors; Magnetic dipole - a differential current loop as a magnetic dipole, Torque on a current loop placed in a magnetic field; Inductance: Basic expressions for self and mutual inductances, self-inductance of a solenoid and toroid.

Unit-VI: Time Varying Fields

Introduction; Integral and point forms of faraday's laws of electromagnetic induction; statically and dynamically induced EMFs; Maxwell's fourth equation, Curl (E) = -∂B/∂t; Modification of Maxwell's equations for time varying fields; Simple problems.

Text Books

1. Engineering Electromagnetics by William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Editon.2006.
2. Electromagnetic Fields by R Meena Kumari, R Subhasri, New Age International, 2008.
3. Elements of Electromagnetics by Matthew N.O. Sadiku, Oxford University Press, 4th edition.

Reference Books

1. Introduction to Electro Dynamics by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition
2. Electromagnetic Field Theory by Yaduvir Singh, Pearson.
3. Fundamentals of Engineering Electromagnetics by Sunil Bhooshan, Oxford higher education.

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: III**
Course Code : V18EET06
Course Name : Electrical and Electronic Measurements **[L : 3; T:1; P : 0 (4 credits)]**
Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C205.1	Identify the proper instrument for measurement of AC or DC voltage and current	K2
C205.2	Choose the suitable instrument for the measurement of power and energy.	K3
C205.3	Understand the operation of potentiometer.	K2
C205.4	Compute the electrical parameters by using appropriate bridge.	K3
C205.5	Calculate different magnetic parameters by using magnetic instruments and illustrate the instrument transformers.	K3
C205.6	Understand the operation of various digital instruments.	K2

Unit-I: Electromechanical Indicating Instruments

Classification of measuring instruments; Construction and principle of operation of PMMC Galvanometer, MI instruments; Extension of instrument ranges using shunts, multipliers; Numerical Problems.

Unit-II: Power and Energy Measurement

Single phase dynamometer wattmeter (LPF and UPF), expression for deflecting and control torques; Type of P.F. Meters; Single phase induction type energy meter, Driving and braking torques, errors and compensations, testing by phantom loading using R.S.S. meter; Numerical Problems.

Unit-III: Potentiometers

Principle and operation of D.C. Crompton's potentiometer and their applications; Types of AC Potentiometers and their Applications.

Unit-IV: Measurement of Parameters

I. Measurement of Resistance: wheat stone's bridge and its Sensitivity; Ohm meter; Kelvin's double bridge; Loss of charge method; Earth resistance measurement by fall of potential method and megger;

II. Measurement of inductance & Q-Factor: Maxwell's bridge; Hay's bridge; Anderson's bridge.

III. Measurement of capacitance and loss angle: Desauty's Bridge; Schering Bridge.

Unit-V: Magnetic Measurements & Instrument Transformers

Magnetic Measurements: Constructional details of Flux meter; Determination of B–H Loop: Methods of reversals and Step-by-Step method; Core loss measurements by Maxwell's and Campbell's Bridges. Instrument Transformers: Ratio and Phase angle errors (Derivation & Phasor Diagram) and their applications in the extension of instrument ranges.

Unit-VI: Electronic Instruments

Introduction; Digital Voltmeters (DVM); Ramp type DVM; Integrating type DVM; Successive-approximation DVM; Digital frequency meter, Digital Tachometer; Measurement of phase difference & Frequency by using lissajous patterns in CRO; Electronic Multi meter.

Text Books:

1. A course in Electrical & Electronic Measurement and Instrumentation by A.K.Sawhney, Dhapat Rai & Co.
2. Electronic Instruments by H.S. Kalsi, Tata Mc-Graw hill.

Reference Books:

1. Electrical and Electronic Measurements and instrumentation by R.K.Rajput, S.Chand.
2. Digital Instrumentation by A.J. Bouwens, Tata Mc-Graw hill.
3. Modern Electronic instrumentation & Measuring instruments by A.D. Heltric & W.C. Copper, Wheeler Publication.
4. Instrument transducers by H.K.P. Neubert, Oxford University press.
5. Electrical Measurements by Forest K. Harris, John Wiley and Sons.

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EET07
Course Name : Electrical Circuit Analysis –II **[L : 3; T:1; P : 0 (4 credits)]**
Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C210.1	Compute electrical parameters for 3-phase balanced systems	K3
C210.2	Determine electrical parameters for 3-phase unbalanced systems	K3
C210.3	Analyse circuit parameters under transient conditions	K3
C210.4	Apply Foster and Cauer methods for Network Synthesis	K3
C210.5	Apply Fourier Series and Transforms for analysing electrical circuits	K3
C210.6	Understand the concept of filters	K3

Unit-I: Balanced Three phase circuits

Advantages of three phase over single phase system; Generation of three phase voltages; Inter connection of three phase windings: Star and delta connection, Phase sequence, Relation between line and phase voltages and currents in balanced systems; Balanced Star connected load supplied from: Balanced 3-phase 4-wire system, balanced 3-phase 3-wire system; Balanced delta connected load supplied from: Balanced 3-phase 3-wire system, measurement of active and reactive power in balanced 3-phase systems.

Unit-II: Unbalanced Three phase circuits

Unbalanced Star connected load supplied from: Balanced 3-phase 4-wire system, balanced 3-phase 3-wire system; Unbalanced delta connected load supplied from: Balanced 3-phase 3-wire system; Analysis of 3-phase unbalanced circuits: Loop method, Star-Delta transformation technique; Measurement of three phase power using two wattmeter method.

Unit-III: Transient analysis in DC and AC Circuits

Initial Conditions; Analysis of R-L, R-C and R-L-C circuits with DC and AC excitations using differential equations and Laplace transforms; Numerical Problems.

Unit-IV: Network Synthesis

Concept of Stability; Hurwitz Polynomials: Properties, Procedure of Testing; Positive real function; Basic synthesis procedure; LC immittance functions; RC impedance and RL admittance functions; RL impedance and RC admittance functions by using Foster and Cauer methods.

Unit-V: Fourier Analysis and Transforms

Fourier Theorem; Trigonometric form and exponential form of Fourier series; Conditions of symmetry; Line spectra and phase angle spectra; Analysis of electrical circuits to non- sinusoidal periodic waveforms.

Fourier integrals and Fourier transforms: Properties of Fourier transforms and application to electrical circuits.

Unit-VI: Passive Filters and Attenuators

Classification and general relations in filters, Constant K low pass, high pass and band pass filters, m-derived low pass, high pass and band pass filters, Attenuators symmetrical and asymmetrical.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw Hill Company, 6th edition
2. Network Analysis by Van Valkenburg, Prentice-Hall of India Private Ltd
3. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, Dhanpat Rai & Co.

Reference Books:

1. Network Theory by N.C. Jagan, C. Lakshminarayana, Anshan Publications
2. Network Theory-Analysis and Synthesis by Smarajit Ghosh, PHI Publishers
3. Fundamentals of Electrical Circuits by Charles K.Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India)
4. Network Analysis by C.L.Wadhwa, New Age International Publishers.
5. Electric Circuits– (Schaum's outlines) by Mahmood Nahvi & Joseph Edminister, Adapted by Kuma Rao, 5th Edition – McGraw Hill.
6. Electrical Circuit Analysis by Sudhakar A. & Shyammohan S.Palli, Mc Graw Hill Publication
7. Introductory Circuit Analysis by Robert L Boylestad, Pearson Publications

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Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
Pedatadepalli, **TADEPALLIGUDEM – 534 101,** W.G. Dist, (A.P.)

Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EET08
Course Name : Digital Electronics **[L : 3; T:1; P : 0 (4 credits)]**

Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C211.1	Understand various number systems, conversation from one radix to another radix.	K2
C211.2	Solve the boolean functions using K-map and tabular minimization	K3
C211.3	Construct the combinational logic circuits	K3
C211.4	Apply PLD's for realization of Boolean	K3
C211.5	Develop the sequential logic circuits such as flip flops, counters and registers.	K3
C211.6	Analyse clocked sequential circuits, finite state machines, Meelay to Moore conversion and vice-versa.	K4

Unit-I: Review of Number Systems & Codes:

i) Representation of numbers of different radix, conversation from one radix to another radix, r-1's compliments and r's compliments of signed members, problem solving.

ii) 4 bit codes, BCD, Excess-3, 2421, 84-2-1 9's compliment code etc.,

iii) Logic operations and error detection & correction codes; Basic logic operations - NOT, OR, AND, Universal building blocks, EX-OR, EX-NOR - Gates, Standard SOP and POS, Forms, Gray code, error detection, error correction codes (parity checking, even parity, odd parity, Hamming code) NAND-NAND and NOR-NOR realizations.

Unit-II: Minimization Techniques:

Boolean theorems, principle of complementation & duality, De-morgan theorems, minimization of logic functions using Boolean theorems, minimization of switching functions using K-Map up to 6 variables, tabular minimization, problem solving (codeconverters using K-Map etc..).

Unit-III: Combinational Logic Circuits Design:

Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit, Excess 3 adder circuit, look-a-head adder circuit, Design of decoder, demultiplexer, 7 segment decoder, higher order demultiplexing, encoder, multiplexer, higher order multiplexing, realization of Boolean functions using decoders and multiplexers, priority encoder, 4-bit digital comparator.

Unit-IV: Introduction of PLD'S:

PROM, PAL, PLA-Basics structures, realization of Boolean function with PLDs, merits & demerits of PROM, PAL, PLA comparison, realization of Boolean functions using PROM, PAL, PLA, programming tables of PROM, PAL, PLA.

Unit-V: Sequential Circuits I:

Classification of sequential circuits (synchronous and asynchronous); basic flip-flops, truth tables and excitation tables (nand RS latch, nor RS latch, RS flip-flop, JK flip-flop, T flip-flop, D flip-flop with reset and clear terminals). Conversion from one flip-flop to flip-flop. Design of ripple counters, design of synchronous counters, Johnson counter, ring counter. Design of registers - Buffer register, control buffer register, shift register, bi-directional shift register, universal shift register.

Unit-VI: Sequential Circuits II:

Finite state machine; Analysis of clocked sequential circuits, state diagrams, state tables, reduction of state tables and state assignment, design procedures. Realization of circuits using various flip-flops. Meelay to Moore conversion and vice-versa.

Text Books:

1. Digital Design – Morris Mano, PHI, 4th Edition, 2008.
2. Switching & Finite Automata theory – Zvi Kohavi, TMH, 3rd Edition, 2011.

Reference Books:

1. Introduction to Switching Theory and Logic Design by Frederick J. Hill , Gerald R., Peterson Mc-Graw Hill TMH edition.
2. Switching Theory and Logic Design by A. Anand Kumar, PHI, 3rd Edition.
3. Fundamentals of Logic Design by Charles H. Roth Jr, Jaico Publishers.
4. Microelectronics by Milliman, MH edition.

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EET09
Course Name : Electrical Machines – II **[L : 3; T:1; P : 0 (4 credits)]**

Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C212.1	Explain the operation and performance of three phase induction motor	K3
C212.2	Analyze the torque-speed relation, performance of induction motor and induction generator	K4
C212.3	Explain the torque production mechanism and starting of single phase induction motors	K3
C212.4	Analyze the performance of synchronous generators by determining its voltage regulation.	K4
C212.5	Examine the parallel operation and control of real and reactive powers for synchronous generators.	K3
C212.6	Understand the operation, performance, starting and power factor corrections of synchronous motors and Mathematical Analysis of power developed, hunting and its suppression	K4

Unit-I: 3-phase Induction Motors

Construction details of cage and wound rotor machines; Production of rotating magnetic field; Principle of operation; Rotor EMF, Rotor frequency, Rotor Current and p.f. at standstill and during running conditions; Rotor power input; rotor copper losses; Mechanical power developed and their interrelationship; Equivalent circuit; Phasor diagram.

Unit-II: Characteristics, starting and testing methods of Induction Motors

Torque equation; expressions for maximum torque and starting torque; torque-slip characteristics; double cage and deep bar rotors construction; crawling and cogging; speed control of induction motor with V/f method; no-load and blocked rotor tests (construction of circle diagram for predetermination of performance parameters); methods of starting, soft starters; induction generator operation (Qualitative treatment only).

Unit-III: Single Phase Motors

Constructional features and its equivalent circuit; Problem of starting – Double revolving field theory; Starting methods; shaded pole motors; AC Series motor.

Unit-IV: Alternators

Constructional features of non–salient and salient pole type alternator; Armature windings – Distributed and concentrated windings; Distribution, Pitch and Winding factors; E.M.F equation; Improvements of waveform and armature reaction; Voltage regulation by synchronous impedance method, MMF method and Potier triangle method; Phasor diagrams; Two reaction analysis of salient pole machine and phasor diagram.

Unit-V: Parallel Operation of Alternators

Parallel operation with infinite bus and other alternators; Synchronizing power; Load sharing; Control of real and reactive powers; Numerical problems.

Unit-VI: Synchronous Motors

Principle and theory of operation of Synchronous Motor; Phasor diagram; Starting torque; Variation of current and power factor with excitation; Synchronous condenser; Mathematical Analysis for power developed; Hunting and its suppression; Methods of starting.

Text Books

1. Electrical Machines by P.S. Bhimbra, Khanna Publishers
2. Theory & Performance of Electrical Machines by J.B.Guptha. S.K.Kataria & Sons

Reference Books

1. Electrical Machines by D. P.Kothari, I .J .Nagarth, McGraw Hill Publications, 4th edition
2. Electrical Machines by R.K.Rajput, Lakshmi publications, 5th edition.
3. Electrical Machinery by Abijith Chakrabarthi and Sudhipta Debnath, McGraw Hill education 2015
4. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2010
5. Electric Machines by Mulukutla S.Sarma & Mukesh k. Pathak, CENGAGE Learning.
6. Electric Machinery by A.E.Fitzgerald, Charles kingsley, Stephen D.Umans, TMH

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EET10
Course Name : Electrical Power Generation and Transmission **[L: 3; T:1; P:0 (4 credits)]**

Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C214.1	Understand the working of conventional power generating stations	K2
C214.2	Choose the proper turbine for a particular power generating station	K3
C214.3	Calculate the performances parameters of various load and insulation resistance and power factor of the cables.	K3
C214.4	Compute the resistance, inductance and capacitance of transmission lines	K3
C214.5	Determine the various transmission line parameters	K3
C214.6	Understand different effects occurred and calculate the corona loss, sag and tension in transmission lines	K3

Unit-I: Conventional Power generating Stations

General layout of a thermal power plant and its Components-General layout of Nuclear power plant - Nuclear fission and Chain Reaction –General Lay out of Hydel power plant and Description of its main components

Unit-II: Turbines

Steam Turbines: Schematic layout of steam power plant, Classification of Steam Turbines-Impulse Turbine and Reaction Turbine- Compounding in Turbines- Velocity Diagrams for simple Impulse and Reaction Turbines- Work done & efficiency

Unit-III: Economic Aspects of Power Generation, Tariffs and Cables

Load curve, load duration and integrated load duration curves, discussion on economic aspects: connected load, maximum demand, and demand factor. Different Tariff methods.

Construction of cables, Types of Cables, Calculation of insulation resistance and power factor of the cable.

Unit-IV: Transmission Line Parameters

Conductor materials: Types of conductors – Calculation of resistance for solid conductors – Calculation of inductance for single phase– Single and double circuit lines–Concept of GMR and GMD–Symmetrical and asymmetrical conductor configuration with and without transposition–Bundled conductors-Numerical Problems–Calculation of capacitance for 2 wire– Effect of ground on capacitance – Capacitance calculations for symmetrical and asymmetrical for single phase–Numerical Problems

Unit-V: Modeling of Transmission Lines

Classification of Transmission Lines: Short, medium and their model representations –Nominal-T– Nominal-Pie and A, B, C, D Constants for symmetrical and Asymmetrical Networks–– Evaluation of A,B,C,D Constants–, regulation and efficiency-Numerical problems-Surge Impedance –Surge Impedance loading-Wavelengths and Velocity of Propagation.

Unit-VI: Sag and Tension Calculations and Overhead Line Insulators

Skin and Proximity effects – Ferranti effect – Charging Current –Shunt Compensation –Corona – Description of the phenomenon–Factors affecting corona- Sag and Tension calculations with equal and unequal heights of towers–Effect of Wind and Ice on weight of Conductor–Numerical Problems

Text Books

1. Generation, Distribution and Utilization of Electric Energy by C.L.Wadhawa, New age International (P) Limited, Publishers
2. Thermal Engineering by Rajput, Lakshmi publications
3. Electrical Power Systems by C.L.Wadhwa, 6th Edition, New Age International Publishers.

Reference Books

1. Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar and Chakrabarti, Dhanpat Rai & Co. Pvt. Ltd
2. A Course in Power Systems by J. B. Gupta, S K Kataria & Sons Publishers.
3. Principles of Power Systems by V.K Mehta and Rohit Mehta, S. Chand Publishers.
4. Electrical Power Systems by P.S.R. Murthy, B.S.Publications.

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EEL04
Course Name : Electrical Circuits & Measurements Laboratory **[L : 0; T:0; P : 2 (1 credits)]**

Course Outcomes

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

CO No.	Course Outcome	Knowledge Level
C215.1	Compute response in the electrical circuits using various Network theorems and determine two port network parameters	K3
C215.2	Sketch Locus Diagrams of RL and RC Series Circuits	K3
C215.3	Find parameters of the circuit under resonance conditions	K3
C215.4	Analyse the measuring parameters of Anderson & Schering bridge.	K3
C215.5	Calibrate voltmeters, ammeters, single phase energy meters	K3
C215.6	Apply various methods to calculate 3phase power and choke coil parameters	K3

Any 5 experiments from each cycle are to be conducted

Cycle I:

1. Verification of Thevenin's and Norton's Theorems
2. Verification of Superposition and Reciprocity Theorem
3. Verification of Compensation and Millmann's Theorems.
4. Verification of Maximum Power Transfer Theorem.
5. Locus Diagrams of RL and RC Series Circuits.
6. Time Response of first order RC and second order RLC Networks.
7. Series and Parallel Resonance
8. Determination of Z, Y, Transmission and hybrid parameters.

Cycle II:

9. Calibration and Testing of single phase energy Meter
10. Calibration of PMMC ammeter and voltmeter using Crompton D.C. Potentiometer
11. Calibration of AC voltmeter and measurement of choke parameters using AC Potentiometer in polar form.
12. Calibration of dynamometer and LPF wattmeter by using phantom and direct loading.
13. Capacitance and Inductance Measurement using Schering Bridge and Anderson bridge.
14. Measurement of 3 phase power with single watt meter and using two C.Ts
15. Measurement of choke coil Parameters by using 3 Voltmeter and 3 Ammeter method.

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EEL05
Course Name : Electrical Machines Laboratory - I

[L : 0; T:0; P : 2 (1 credits)]

Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C216.1	Apply and Deduce the principles of Electrical Machines through laboratory experimental work	K3
C216.2	Connect the circuit to perform experiments and measure the required parameters	K3
C216.3	Analyse the observed data & come to a conclusion	
C216.4	Organize reports based on performed experiments with effective demonstration of diagrams and characteristics /graph	K4
C216.5	Demonstrate the performance of Electrical Machines.	K4
C216.6	Troubleshoot the operation of Electrical machines.	K3

Any 10 of the following experiments are to be conducted

1. Magnetization characteristics of DC shunt generator: Determination of critical field resistance and critical speed.
2. Brake test on DC shunt motor. Determination of performance curves.
3. Hopkinson's test on DC shunt machines. Predetermination of efficiency.
4. Swinburne's test and Predetermination of efficiencies as Generator and Motor.
5. Speed control of DC shunt motor by Field and armature Control.
6. Retardation test on DC shunt motor. Determination of losses at rated speed.
7. Separation of losses in DC shunts motor.
8. OC & SC test on single phase transformer.
9. Sumpner's test on single phase transformers.
10. Scott connection of transformers.
11. Parallel operation of Single phase Transformers.
12. Separation of core losses of a single phase transformer.
13. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers.

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Department of Electrical and Electronics Engineering

Programme : **B. Tech - Electrical & Electronics Engineering** **Semester: IV**
Course Code : V18EET56
Course Name : Electrical Safety & IE Rules **[L : 2; T:0; P : 0 (MNC)]**

Course Outcomes

After successful completion of this course, students will be able to

CO No.	Course Outcome	Knowledge Level
C218.1	Understand the types of electrical hazards and its impact on human body	K2
C218.2	Identify various electrical safety equipment required in power industries.	K2
C218.3	Explain different types of safety methods needed for safe operation of power system	K2
C218.4	Demonstrate the electrical accident rescue techniques and required first aid	K3
C218.5	Understand the departmental procedure for obtaining service connection	K2
C218.6	Describe various IE rules in Indian Electricity Act	K2

Unit-I: Hazards of Electricity

Introduction, Hazard Analysis, Shock, Arc, Blast, Affected Body Parts, Summary Of Causes—Injury And Death, Protective Strategies.

Unit-II: Electrical Safety Equipment

Introduction, General Inspection and Testing Requirements for Electrical Safety Equipment, Flash And Thermal Protection, Head and Eye Protection, Rubber Insulating Equipment, Hot Sticks, Insulated Tools, Barriers And Signs Safety Tags, Locks, and Locking Devices , The Electrician's Safety Kit

Unit-III: Safety Procedures and Methods

Introduction, The Six-Step Safety Method, Job Briefings, Energized Or De-Energized?, Safe Switching Of Power Systems, Energy Control Programs, Lockout-Tagout, Placement Of Safety Grounds, Barriers And Warning Signs, Tools And Test Equipment, The One-Minute Safety Audit.

Unit-IV: Accident Prevention, Rescue, and First Aid

Accident Prevention, Individual Responsibility, Installation Safety, First Aid , Resuscitation (Artificial Respiration), Heart-Lung Resuscitation, Rescue Techniques, General Rescue Procedures, Accident Investigation

Unit-V: Departmental Procedures and Tests

Departmental procedure for obtaining service connection, Insulation resistance and Earth resistance, testing of electrical installation, Insulation resistance between conductor and earth, load survey.

Unit-VI: REC and Indian Electricity Act

Introduction, Rural Electrification, Indian Electricity Rules, National Electrical Code.

Textbooks:

1. Electrical Saftey hand book by John Cadick, Mary Capelli-Schellpfeffer, Dennis K. Neitzel, 3rd edition, McGraw-Hill Publications.

References:

1. Indian Electricity Act 2003
2. The Indian Electricity Rules, 1956
3. A Study Guide on Electrical Safety Hazards Awareness by EFCOG Electrical Safety Improvement Project.

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Annexure-III

	Course Code	Course	Name of the Faculty	No. of Students			Pass %	No. of Students Secured						failed only in this Course	Pass % (If single Course failures Could be avoided)	Grade Point		
				Appeared	Passed	Fail		'S' Grade >=90	'A' Grade >=80 to <90	'B' Grade >=70 to <80	'C' Grade >=60 to <70	'D' Grade >=50 to <60	'E' Grade >=40 to <50			MIN	MAX	AVG
ME-A	V18EET01	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Sri K.Suresh	42	24	18	57.14	0	1	5	5	3	10	3	64.29	5	9	6.33
ME-B	V18EET01	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Sri K.Suresh	38	32	6	84.21	0	4	7	6	10	5	4	94.74	5	9	6.84
CSE-A	V18EET01	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Sri G.Madhu Sagar Babu	58	29	29	50	0	2	2	3	11	11	10	67.24	5	9	6.07
CSE-B	V18EET01	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Sri G.Madhu Sagar Babu	60	60	0	100	0	8	17	19	10	6	0	100	5	9	7.18
CSE-C	V18EET01	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Sri A. U. S. Naga Prasad	59	55	4	93.22	2	13	7	24	8	1	2	96.61	5	10	7.53
CSE-D	V18EET01	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Sri A. U. S. Naga Prasad	60	60	0	100	5	11	19	13	8	4	0	100	5	10	7.67