



**ACE**  
**ENGINEERING COLLEGE**

Ankushapur, Ghatkesar – 501 301

(Autonomous)

**B.TECH. FOUR YEAR DEGREE COURSE**  
**ELECTRICAL AND ELECTRONICS ENGINEERING**  
**COURSE STRUCTURE**

II Year			Course Title	I Semester			Credits
S.No.	Course type	Course Code		Periods per week			
				L	T	P	
1	ESC	ME301ES	Engineering Mechanics	3	1	0	4
2	PCC	EE302PC	Electrical Circuits	3	1	0	4
3	PCC	EE303PC	Analog Electronics	3	0	0	3
4	PCC	EE304PC	Electrical Machines-I	3	1	0	4
5	PCC	EE305PC	Electromagnetic Fields	3	0	0	3
6	PCC	EE306PC	Electrical Machines Lab-I	0	0	2	1
7	PCC	EE307PC	Analog Electronics Lab	0	0	2	1
8	PCC	EE308PC	Electrical Circuits Lab	0	0	2	1
9	MC	MC309HS	Gender Sensitization Lab	0	0	2	0
10	MC	MC310CS	Fundamentals of Data Structures	3	0	0	0
<b>Total</b>				<b>18</b>	<b>3</b>	<b>8</b>	<b>21</b>

Note: \*MC = Satisfactory/Unsatisfactory

## ME203ES/ME301ES: ENGINEERING MECHANICS

<b>B. TECH. II YEAR I SEMESTER</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>ME203ES/ME301ES</b>	ESC	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite:</b> applied physics								
<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. Explain the resolution of a system of forces, compute their resultant and solve problems using equations of equilibrium</li> <li>2. Perform analysis of bodies lying on rough surfaces.</li> <li>3. Locate the centroid of a body and compute the area moment of inertia and mass moment of inertia of standard and composite sections</li> <li>4. Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies.</li> <li>5. Explain the concepts of work-energy method and its applications to translation, rotation and plane motion and the concept of vibrations</li> </ol>								
<b>Course Outcomes:</b> <p>Upon completing this course, the student will be able to</p> <ol style="list-style-type: none"> <li>1. Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.</li> <li>2. Solve problem of bodies subjected to friction.</li> <li>3. Find the location of centroid and calculate moment of inertia of a given section.</li> <li>4. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.</li> <li>5. Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.</li> </ol>								
<b>Unit-I</b>	<b>INTRODUCTION TO ENGINEERING MECHANICS</b>				<b>No. of Classes: 12</b>			
Introduction to Engineering Mechanics - Force Systems :Basic concepts, Particle equilibrium in 2-D & 3-D; Rigid Body equilibrium; System of Forces, Coplanar Concurrent Forces, Components in Space – Resultant- Moment of Forces and its Application; Couples and Resultant of Force System, Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems; Static Indeterminacy								
<b>Unit-II</b>	<b>FRICTION, CENTROID AND CENTRE OF GRAVITY</b>				<b>No. of Classes: 12</b>			
<b>Friction:</b> Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, wedge friction, screw jack & differential screw jack; Centroid and Centre of Gravity-Centroid of Lines, Areas and Volumes from first principle, centroid of composite sections; Centre of Gravity and its implications. – Theorem of Pappus.								
<b>Unit-III</b>	<b>MOMENT OF INERTIA</b>				<b>No. of Classes: 12</b>			

Area moment of inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Product of Inertia, Parallel Axis Theorem, Perpendicular Axis Theorem Mass Moment of Inertia : Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia – Mass moment of inertia of composite bodies

**Unit-IV**

**REVIEW OF PARTICLE DYNAMICS**

**No. of Classes: 12**

Review of particle dynamics- Rectilinear motion; Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion; Newton's 2nd law (rectangular, path, and polar coordinates). Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique).

**Unit-V**

**KINETICS OF RIGID BODIES**

**No. of Classes: 12**

Kinetics of Rigid Bodies -Basic terms, general principles in dynamics; Types of motion, Instantaneous centre of rotation in plane motion and simple problems; D'Alembert's principle and its applications in plane motion and connected bodies; Work Energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation

**TEXT BOOKS:**

1. Shames and Rao(2006) , Engineering Mechanics, Pearson Education
2. Reddy Vijay Kumar K. and J. Suresh Kumar (2010), Singer's Engineering Mechanics – Statics & Dynamics

**REFERENCE BOOKS:.**

1. Timoshenko S.P and Young D.H., "Engineering Mechanics", McGraw Hill International Edition,1983.
2. Andrew Pytel, JaanKiusalaas, "Engineering Mechanics", Cengage Learning,2014.
3. Beer F.P & Johnston E.R Jr. Vector, "Mechanics for Engineers", TMH,2004.
4. Hibbeler R.C & Ashok Gupta, "Engineering Mechanics", Pearson Education,2010.

**WEB REFERENCES:**

1. <http://bit.ly/2XHb4VZ>
2. <http://bit.ly/2XJ2HsH>
3. <http://bit.ly/2XDo92B>

**E TEXT BOOKS:**

- 1.<https://drive.google.com/file/d/1YMB27ny5xwDPJYScxxSOQlTU1BAS0PJh/view>
- 2.<https://drive.google.com/file/d/1hQD4agrMqHEi6KEEFUnJtC6D5JbXE6Al/view>

## EE302PC: ELECTRICAL CIRCUITS

<b>B.TECH. II YEAR I SEMESTER</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>EE302PC</b>	<b>Core</b>	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite: Nil</b>								
<b>Course Objectives:</b>								
<ol style="list-style-type: none"> <li>1. To understand the concept of network theorems.</li> <li>2. To analyze transients in Electrical systems.</li> <li>3. To evaluate Network parameters of given Electrical network</li> <li>4. To design basic filter configurations</li> </ol>								
<b>Course Outcomes:</b> Upon completing this course, the student will be able to								
<ol style="list-style-type: none"> <li>1. Apply network theorems for the analysis of electrical circuits.</li> <li>2. Identify the transient and steady-state response of electrical circuits.</li> <li>3. Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).</li> <li>4. Analyze of electrical circuits using Laplace Transform</li> <li>5. Analyze two port circuit behaviors.</li> </ol>								
<b>Unit: I</b>	<b>NETWORK THEOREMS</b>				<b>No. of Classes: 12</b>			
Node and Mesh Analysis, Thevenin theorem, Norton theorem, Superposition theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem. Analysis with dependent current and voltage sources. Concept of duality and dual networks								
<b>Unit: II</b>	<b>STEADY STATE ANALYSIS</b>				<b>No. of Classes: 12</b>			
Analysis of first and second order equations for Series and parallel R-L, R-C, RL-C circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response for DC and AC Excitations.								
<b>Unit: III</b>	<b>TRANSIENT ANALYSIS</b>				<b>No. of Classes: 12</b>			
Representation of sine function as rotating phasor, phasor diagrams, impedances and admittances, AC circuit analysis, effective or RMS values, average power and complex power. Three-phase circuits. Mutual coupled circuits, Dot Convention in coupled circuits, Ideal Transformer								
<b>Unit: IV</b>	<b>Time and Frequency domain Analysis</b>				<b>No. of Classes: 12</b>			
Review of Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, convolution integral, inverse Laplace transform, transformed network with initial conditions. Transfer function representation. Poles and Zeros. Frequency response (magnitude and phase plots), series and parallel resonances								

Unit: V	TWO PORT NETWORKS	No. of Classes: 12
Two Port Networks, terminal pairs, relationship of two port variables, impedance parameters, admittance parameters, transmission parameters and hybrid parameters, interconnections of two port networks.		
<p><b>TEXT BOOKS:</b></p> <ol style="list-style-type: none"> <li>1. M. E. Van Valkenburg and T.S. Rathore, “Network Analysis”, Prentice Hall, Revised Third Edition, 2019.</li> <li>2. D. Roy Choudhury, “Networks and Systems”, New Age International Publications, 2<sup>nd</sup> Edition, 2013.</li> </ol>		
<p><b>REFERENCE BOOKS:</b></p> <ol style="list-style-type: none"> <li>1. W. H. Hayt and J. E. Kemmerly, “Engineering Circuit Analysis”, McGraw Hill Education, 2013.</li> <li>2. C. K. Alexander and M. N. O. Sadiku, “Electric Circuits”, McGraw Hill Education, sixth edition, 2019.</li> <li>3. K. V. V. Murthy and M. S. Kamath, “Basic Circuit Analysis”, Jaico Publishers, 2006.</li> </ol>		
<p><b>WEB REFERENCES:</b></p> <ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/basic%20electric%20circuits">https://nptel.ac.in/courses/basic electric circuits</a></li> <li>2. <a href="https://www.allaboutcircuits.com/textbook/">https://www.allaboutcircuits.com/textbook/</a></li> </ol>		

## EE303PC: ANALOG ELECTRONICS

<b>B.TECH. II YEAR I SEMESTER</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>EE303PC</b>	<b>Core</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	-	-	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			
<b>Prerequisite:</b> applied physics								
<b>Course Objectives:</b>								
To make the student								
<ol style="list-style-type: none"> <li>1. To introduce components such as diodes, BJTs and FETs their switching characteristics, applications.</li> <li>2. Learn the concepts of high frequency analysis of transistors.</li> <li>3. To give understanding of various types of basic and feedback amplifier circuits such as small signal, cascaded, large signal and tuned amplifiers.</li> </ol>								
<b>Course Outcomes:</b>								
After completion of this course the student will be able to								
<ol style="list-style-type: none"> <li>1. Know the characteristics, utilization of various components.</li> <li>2. Understand the biasing techniques.</li> <li>3. Design and analyze various rectifiers, small signal amplifier circuits.</li> <li>4. Design sinusoidal and non-sinusoidal oscillators.</li> </ol>								
<b>Unit: I</b>	<b>DIODE CIRCUITS &amp; INTRODUCTION TO TRANSISTOR BJT</b>					<b>No. of Classes: 09</b>		
<p><b>DIODE CIRCUITS:</b> Diode Circuits: P-N junction diode, I-V characteristics of a diode; review of half-wave and full-wave rectifiers, clamping and clipping circuits.</p> <p>Input output characteristics of BJT in CB, CE, CC configurations, biasing circuits, Load line analysis, common-emitter, common-base and common collector amplifiers; Small signal equivalent circuits.</p>								
<b>Unit: II</b>	<b>MOSFET CIRCUITS</b>					<b>No. of Classes: 09</b>		
<p>MOSFET structure and I-V characteristics. MOSFET as a switch. small signal equivalent circuits - gain, input and output impedances, small-signal model and common-source, common-gate and common-drain amplifiers, trans conductance, high frequency equivalent circuit.</p>								
<b>Unit: III</b>	<b>MULTI STATE &amp; POWER AMPLIFIERS</b>					<b>No. of Classes: 09</b>		
<p>Direct coupled and RC Coupled multi-stage amplifiers; Differential Amplifiers, Power amplifiers - Class A, Class B, Class C</p>								
<b>Unit: IV</b>	<b>FEEDBACK AMPLIFIERS</b>					<b>No. of Classes:09</b>		
<p><b>Feedback Amplifiers Feedback Amplifiers:</b> Concepts of feedback – Classification of feedback amplifiers – General characteristics of Negative feedback amplifiers – Effect of Feedback on Amplifier characteristics – Voltage series, Voltage shunt, Current series and Current shunt Feedback configurations – Simple Problems.</p>								
<p><b>Oscillators:</b> Condition for Oscillations, RC type Oscillators-RC phase shift and Wien-bridge</p>								

Oscillators, LC type Oscillators –Generalized analysis of LC Oscillators, Hartley and Colpitts Oscillators.

Unit: V

OSCILLATORS

No. of Classes: 09

Ideal op-amp, Output offset voltage, input bias current, input offset current, slew rate, gain bandwidth product, Inverting and non-inverting amplifier, Differentiator, integrator, Square-wave and triangular-wave generators.

**TEXT BOOKS:**

3. Electronic Devices and Circuits- Jacob Millman, McGraw Hill Education
4. Electronic Devices and Circuits theory– Robert L. Boylestead, Louis Nashelsky, 11<sup>th</sup> Edition, 2009, Pearson.
5. Micro Electronics By Sedra Mith

**REFERENCE BOOKS:**

1. The Art of Electronics, Horowitz, 3<sup>rd</sup> Edition Cambridge University Press
2. Electronic Devices and Circuits, David A. Bell – 5<sup>th</sup> Edition, Oxford.

**WEB REFERENCES:**

1. <https://www.youtube.com/watch?v=fSV8dhjuaom>
2. <https://www.youtube.com/watch?v=0C4uxtS-tlQ>
3. <https://www.youtube.com/watch?v=-bz6u7lF1gM>
4. <https://www.youtube.com/watch?v=MUBiC9yz2fc>
5. <https://www.youtube.com/watch?v=2GijhTUQTbw>
6. <https://www.youtube.com/watch?v=m4sjTt7rhow&t=14s>
7. <https://www.youtube.com/watch?v=M3yI0byaqKc>

**E TEXT BOOKS:**

1. <https://www.e-booksdirectory.com/details.php?ebook=8466>
2. <https://www.e-booksdirectory.com/details.php?ebook=1109>
3. <https://www.e-booksdirectory.com/details.php?ebook=5302>

## EE304PC: ELECTRICAL MACHINES-I

<b>B.TECH. II YEAR I SEMESTER</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EE304PC	Core	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite: BEE</b>								
<b>Course Objectives:</b>								
<ol style="list-style-type: none"> <li>1. To study and understand different types of DC generators,</li> <li>2. To understand the operation of Motors</li> <li>3. To explain the concepts of Transformers</li> <li>4. To study the performance aspects of various testing methods.</li> </ol>								
<b>Course Outcomes:</b>								
Upon completing this course, the student will be able to								
<ol style="list-style-type: none"> <li>1. Identify different parts of a DC generators</li> <li>2. Calculate constant and variable losses of DC motors</li> <li>3. Identify different testing methods to predetermine the efficiency of DC machines</li> <li>4. Draw Phasor diagram of single phase Transformer</li> <li>5. Analyze OC and SC tests</li> </ol>								
<b>Unit : I</b>	<b>D.C. GENERATORS</b>					<b>No. of Classes: 12</b>		
Principles of Electro-Mechanical conversion systems. Principle of operation – Action of commutator – constructional features – armature windings– simplex and multiplex windings, lap and wave windings — use of laminated armature – E. M.F Equation. Armature reaction – Cross magnetizing and de-magnetizing– compensating winding –methods of improving commutation. Methods of Excitation –External and Internal characteristics of DC generator.								
<b>Unit : II</b>	<b>D.C MOTORS</b>					<b>No. of Classes: 12</b>		
Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation. Speed control of D.C. Motors - Armature voltage and field flux control methods. Motor starters (3-point and 4-point starters) - Losses – Constant & Variable losses – calculation of efficiency – condition for maximum efficiency.								
<b>Unit : III</b>	<b>TESTING OF DC MACHINES</b>					<b>No. of Classes: 12</b>		
Methods of Testing – direct, indirect, and regenerative testing – Brake test – Swinburne’s test – Hopkinson’s test – Field’s test - separation of stray losses in a d.c. motor test.								
<b>Unit : IV</b>	<b>SINGLE PHASE TRANSFORMERS</b>					<b>No. of Classes:12</b>		
Types - constructional details-minimization of hysteresis and eddy current losses- EMF equation - operation on no load and on load - phasor diagrams Equivalent circuit - losses and efficiency – regulation - All day efficiency - effect of variations of frequency & supply voltage on iron losses.								

Unit : V	TESTING OF TRANSFORMERS AND POLY-PHASE TRANSFORMERS	No. of Classes: 12
<p>OC and SC tests - Sumpner's test - predetermination of efficiency and regulation-separation of losses test-parallel operation with equal and unequal voltage ratios - auto transformers-equivalent circuit - comparison with two winding transformers. Poly-phase transformers – Poly-phase connections - Y/Y, Y/<math>\Delta</math>, <math>\Delta</math>/Y, <math>\Delta</math>/<math>\Delta</math> and open <math>\Delta</math>.</p>		
<p><b>TEXT BOOKS:</b></p> <ol style="list-style-type: none"> <li>1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013.</li> <li>2. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2004.</li> </ol>		
<p><b>REFERENCE BOOKS:</b></p> <ol style="list-style-type: none"> <li>1. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010</li> <li>2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.</li> <li>3. Aahfag Husain, Harroon Asgfag, Electric Machines, Dhanpat Rai &amp; Co. (P) Limited 2016</li> </ol>		
<p><b>WEB REFERENCES:</b></p> <ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/electrical_machines-I">https://nptel.ac.in/courses/electrical_machines-I</a></li> <li>2. <a href="https://shodhganga.inflibnet.ac.in/bitstream/10603/17295/13/13_chapter3.pdf">https://shodhganga.inflibnet.ac.in/bitstream/10603/17295/13/13_chapter3.pdf</a></li> <li>3. <a href="https://onlinelibrary.wiley.com/doi/pdf/10.1002/0470846119.fmatter_indsub">https://onlinelibrary.wiley.com/doi/pdf/10.1002/0470846119.fmatter_indsub</a></li> <li>4. <a href="https://ieeexplore.ieee.org/iel5/2224/21343/00990185.pdf">https://ieeexplore.ieee.org/iel5/2224/21343/00990185.pdf</a></li> </ol>		

## EE305PC: ELECTROMAGNETIC FIELDS

<b>B.TECH. II YEAR I SEMESTER</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>EE305PC</b>	<b>Core</b>	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite: Vector Algebra, Physics</b>								
<b>Course Objectives:</b>								
<ol style="list-style-type: none"> <li>1. To provide the basic skills required to understand the applications involving electromagnetic fields.</li> <li>2. Understand the behavior of electrical materials in the presence of Electric fields</li> <li>3. Understand the behavior of Magnetic materials in the presence of magnetic fields</li> <li>4. Define and derive expressions for the energy both for the electrostatic and magnetostatic fields,</li> <li>5. Evaluate Maxwell's Equations for time-harmonic fields</li> </ol>								
<b>Course Outcomes:</b> At the end of the course, students will demonstrate the ability								
<ol style="list-style-type: none"> <li>1 To analyze the basic laws of electromagnetism.</li> <li>2 To obtain the electric and magnetic fields for simple configurations under static conditions.</li> <li>3 To analyze time varying electric and magnetic fields.</li> <li>4 To apply Maxwell's equation in different forms and different media.</li> <li>5 To analyze the propagation of EM waves.</li> </ol>								
<b>Unit: I</b>	<b>Static Electric Field:</b>				<b>No. of Classes: 12</b>			
Review of conversion of a vector from one coordinate system to another coordinate system, Coulomb's law, Electric field intensity, Electrical field due to point charges. Line, Surface and Volume charge distributions. Gauss law and its applications. Absolute Electric potential, potential difference, Calculation of potential differences for different configurations. Electric dipole, Electrostatic Energy and Energy density.								
<b>Unit: II</b>	<b>Conductors, Dielectrics and Capacitance</b>				<b>No. of Classes: 12</b>			
Current and current density, Ohms Law in Point form, Continuity equation, Boundary conditions of conductors and dielectric materials. Capacitance, Capacitance of a two-wire line, Poisson's equation, Laplace's equation, Solution of Laplace and Poisson's equation.								
<b>Unit: III</b>	<b>Static Magnetic Fields and Magnetic Forces:</b>				<b>No. of Classes: 12</b>			
Static Magnetic Fields and Magnetic Forces: Biot-Savart Law, Ampere Law, Magnetic flux and magnetic flux density, Scalar and Vector Magnetic potentials. Steady magnetic fields produced by current carrying conductors. Force on a moving charge, Force on a differential current element, Force between differential current elements, Magnetic boundary conditions, Magnetic circuits, Self inductances and mutual inductances.								
<b>Unit: IV</b>	<b>Time Varying Fields and Maxwell's Equations:</b>				<b>No. of Classes: 12</b>			
Faraday's law for Electromagnetic induction, Displacement current, Point form of Maxwell's equation, Integral form of Maxwell's equations, Motional Electromotive forces.								

Unit: V	Electromagnetic Waves	No.of Classes: 12
Derivation of Wave Equation, Uniform Plane Waves, Maxwell's equation in Phasor form, Wave equation in Phasor form, Plane wave in free space and in a homogenous material. Wave equation for a conducting medium, Plane waves in lossy dielectrics, Propagation in good conductors. Poynting theorem.		
<b>TEXT BOOKS:</b> <ol style="list-style-type: none"> <li data-bbox="203 373 1421 443">1. "William H. Hayt &amp; John. A. Buck, Engineering Electro magnetics" Mc. Graw-Hill Companies, 7<sup>th</sup> Editon.2009.</li> <li data-bbox="203 472 1421 541">2. Matthew N.O Sadiku and S.V Kulkarni, Principles of Electromagnetics: Sixth Edition, Oxford Publications, 2015</li> </ol>		
<b>REFERENCE BOOKS:</b> <ol style="list-style-type: none"> <li data-bbox="203 632 1421 680">1. D J Griffiths, Introduction to Electro Dynamics -, Prentice-Hall of India Pvt. Ltd, 4<sup>th</sup> editon, 2015.</li> <li data-bbox="203 680 1421 716">2. J P Tewari , Electricity &amp; Magnetism-, Khanna Publishers, Kindle Edition, 2018.</li> <li data-bbox="203 716 1421 751">3. S. Kamakshaiah, Electromagnetic fields - Right Publishers, 2007.</li> <li data-bbox="203 751 1421 787">4. Matthew N.O sadiku, Computational Electromagnetics with MATLAB, Fourth Edition Hardcover – 2018</li> </ol>		
<b>WEB REFERENCES:</b> <ol style="list-style-type: none"> <li data-bbox="159 961 1421 997">1 . <a href="https://nptel.ac.in/courses/Electromagnetic Theory">https://nptel.ac.in/courses/Electromagnetic Theory</a></li> <li data-bbox="159 1024 1421 1060">2. <a href="https://shodhganga.inflibnet.ac.in/bitstream/10603/17295/13/13_chapter3.pdf">https://shodhganga.inflibnet.ac.in/bitstream/10603/17295/13/13_chapter3.pdf</a></li> <li data-bbox="159 1087 1421 1123">3. <a href="https://onlinelibrary.wiley.com/doi/pdf/10.1002/0470846119.fmatter_insub">https://onlinelibrary.wiley.com/doi/pdf/10.1002/0470846119.fmatter_insub</a></li> <li data-bbox="159 1150 1421 1186">4. <a href="https://ieeexplore.ieee.org/iel5/2224/21343/00990185.pdf">https://ieeexplore.ieee.org/iel5/2224/21343/00990185.pdf</a></li> </ol>		

## **EE306PC: ELECTRICAL MACHINES LAB-I**

### **B.TECH. II YEAR I SEMESTER**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
<b>EE306PC</b>	<b>Core</b>	-	-	2	1	30	70	100
		<b>Practical Classes: 45</b>			<b>Total Classes: 45</b>			
<b>Contact Classes: Nil</b>	<b>Tutorial Classes: Nil</b>							

**Prerequisite:** Nil

#### **Course Objectives:**

1. The ability to conduct testing and experimental procedures on different types of electrical machines.
2. A chance to practice different types of wiring and devices connections.
3. The capability to analyze the operation of electric machines under different loading conditions
4. The ability to conduct testing and experimental procedures on transformers

#### **Course Outcomes: After completion of this lab the student is able to**

1. Start and control the Different DC Machines.
2. Assess the performance of different machines using different testing methods
3. Identify different conditions required to be satisfied for self - excitation of DC Generators.
4. Separate iron losses of DC machines into different components
5. The student able to assess the performance of the transformer.

#### **List of Experiments: The following 1-10 experiments are to be conducted compulsorily. And required to conduct at least any two from remaining experiments.**

1. Magnetization characteristics of DC shunt generator.
2. Load test on DC shunt generator.
3. Load test on DC series generator.
4. test on DC compound generator.
5. Speed control of DC shunt motor.
6. Brake test on DC shunt motor.
7. Brake test on DC compound motor.
8. Swinburne's test on DC shunt machine
9. Hopkinson's tests on DC shunt machines.
10. Fields test on DC series machines.
11. Separation of losses in DC shunt motor.
12. Retardation test on DC shunt motor.
13. O.C. & S.C. Tests on Single phase Transformer
14. Sumpner's test on a pair of single phase transformers
15. Parallel operation of Single phase Transformers

**List of Equipment/Software (with Specifications or Range) Required:**

1. Central control panel with 16 channels
2. Rectifier AC I/p 3 phase 440 V DC o/p 220V 100A, with boost and buck press button
- 3.D.C. Shunt Motor – Shunt Generator Set
- 4.DC Shunt Motor
- 5.D.C. shunt motor -D.C series generator Set
- 6.D.C. shunt motor -D.C compound generator Set
- 7.D. C compound motor
- 8.D.C Series Motor-D.C Series Generator Set
- 9.DC Shunt Motor -3- $\Phi$  Alternator Set
- 10.AC 3 phase Squirrel Cage Induction Motor
- 11.AC 3 phase Slipring Induction Motor
- 12.DC Shunt Motor- 3 $\Phi$  Synchronous Motor
- 13.Single Phase Induction Motor
14. Three phase auto transformer 5KVA closed type
15. Transformer single phase 2 KVA i/p 220 V o/p 220 V --- 3 No"s
16. Transformer single phase 3 KVA i/p 220 V o/p 220 V ---- 7 No"s
17. Transformer single phase 1 KVA i/p 220 V o/p 220 V ----- 2 No"s
18. Single phase auto transformer
- 19.Single phase auto transformer 8 A
- 20.Booster Transformer 230V/0-50V, 15A
- 21.Single phase auto transformer 10 Amps
- 22.Rheostats
23. Voltmeters
- 24.Ammeters
- 25.Wattmeter"s
- 26.Tachometers

## **E307PC: ANALOG ELECTRONICS LAB**

### **B.TECH. II YEAR I SEMESTER**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
<b>EE307PC</b>	Core							
		-	-	2	1	30	70	100
<b>Contact Classes: Nil</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: 45</b>			<b>Total Classes: 45</b>			

**Prerequisite: Semi-Conductor Physics**

**Course Objectives:** Upon completion of the course, students will be able to:

1. To understand know the characteristics, utilization of various components.
2. Design and analyze various rectifiers, small signal amplifier circuits.
3. To introduce components such as diodes, BJTs and FETs their switching characteristics, Applications.
4. To understand the biasing techniques.
5. To learn the concepts of high frequency analysis of transistors.
6. To give understanding of various types of basic and feedback amplifier circuits.
7. To design sinusoidal and non-sinusoidal oscillators.

**List of Experiments:** Verify any twelve experiments in H/W Laboratory

1. PN Junction diode characteristics A) Forward bias B) Reverse bias.
2. Full Wave Rectifier with & without filters
3. Common Emitter Amplifier Characteristics
4. Common Base Amplifier Characteristics
5. Common Source amplifier Characteristics
6. Measurement of h-parameters of transistor in CB, CE, CC configurations
7. Two stage RC coupled amplifier
8. Current Shunt Feedback amplifier
9. Voltage series feedback amplifier
10. RC Phase shift Oscillator
11. Wien bridge oscillator
12. Hartley & Colpitt's Oscillators
13. Class A power amplifier
14. Class B Complementary symmetry amplifier.

**List of Equipment/Software(with Specifications or Range) Required:**

1. Regulated Power Suppliers, 0-30V
2. 20 MHz, Dual Channel Cathode Ray Oscilloscopes.
3. Functions Generators-Sine and Square wave signals
4. Multi-metres
5. Electronic Components.

## EE308PC: ELECTRICAL CIRCUITS LAB

### B. TECH. II YEAR I SEMESTER

Course Code	Category	Hours/Week			Credits	Maximum Marks		
EE308PC	Core	L	T	P	C	CIA	SEE	Total
		0	0	2	1	30	70	100
Content Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45			Total Classes: 45			

Prerequisite: Basic Electrical Engineering, Electrical Circuits

#### Course Objectives:

The Student will

1. Understand the various network theorems
2. Understand the concept of RC/RL networks
3. Measure three phase powers.
4. Understand the verification of Transmission and Hybrid parameters in a Two -Port Network

#### Course Outcomes:

The Student will be able to

1. Apply mesh and nodal concepts.
2. Measure active power for star-delta connected balanced and unbalanced loads
3. Verify response of RC/RL networks.
4. Determine coefficient of coupling in a coupled circuit
5. Identify the Impedance and Admittance parameters in a Two -Port Network

#### List of Experiments: The following 1-12 experiments are to be conducted compulsorily.

1. Verification of Thevenin's and Norton's Theorem
2. Verification of Superposition
3. Verification of Reciprocity Theorem.
4. Verification of Maximum power Transform Theorem.
5. Verification of Compensation Theorem.
6. Time Response of first orders RC /RL network for periodic non-sinusoidal inputs -Time constant and steady state error determination.
7. Measurement of Active Powers for Star and Delta Connected Balanced and unbalanced Loads.
8. Measurement of Reactive Powers for Star and Delta Connected Balanced and unbalanced Loads.
9. Resonant frequency, Band width and Q-factor Calculation in Series and parallel Resonant Circuits.
10. Separation of Self, Mutual Inductance and Determine coefficient of coupling in a coupled circuit.
11. Analytical verification of Impedance and Admittance parameters in a Two -Port Network.
12. Analytical verification of Transmission and Hybrid parameters in a Two -Port Network.

#### List of Equipment/Software (with Specifications or Range) Required:

1. RPS
2. Multimeter
3. Bread Boards
4. Trainer Kits
5. Mutual Inductance kit

## MC309HS: GENDER SENSITIZATION LAB

### B.TECH. II YEAR I SEMESTER

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
MC309HS	MC	0	0	2	0	30	70	100
		<b>Practical Classes: Nil</b>			<b>Total Classes: 30</b>			
<b>Contact Classes: 30</b>	<b>Tutorial Classes: Nil</b>							

#### COURSE DESCRIPTION:

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality. This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender- based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

#### Course Objectives:

1. To develop students' sensibility with regard to issues of gender in contemporary India.
2. To provide a critical perspective on the socialization of men and women.
3. To introduce students to information about some key biological aspects of genders.
4. To expose the students to debates on the politics and economics of work.
5. To help students reflect critically on gender violence.
6. To expose students to more egalitarian interactions between men and women.

#### Course Outcomes:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.
6. Students will develop a sense of appreciation of women in all walks of life.
7. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

**Unit : I**

**UNDERSTANDING GENDER**

**No. of Classes: 06**

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.

<b>Unit : II</b>	<b>GENDER ROLES AND RELATIONS</b>	<b>No. of Classes: 06</b>
Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary.		
<b>Unit : III</b>	<b>GENDER AND LABOUR</b>	<b>No. of Classes: 06</b>
Division and Valuation of Labour-Housework: The Invisible Labor- “My Mother doesn’t Work.” “Share the Load.”-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human RightsGender and Mainstreaming		
<b>Unit : IV</b>	<b>GENDER - BASED VIOLENCE</b>	<b>No. of Classes:06</b>
The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No! -Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “Chupulu”. Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-“I Fought for my Life....”		
<b>Unit : V</b>	<b>GENDER AND CULTURE</b>	<b>No. of Classes: 06</b>
Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature-Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa ParksThe Brave Heart.		
<p><b>Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.</b></p> <ul style="list-style-type: none"> <li>➤ Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments. Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on “Gender”.</li> <li>➤ ESSENTIAL READING: The Textbook, “Towards a World of Equals: A Bilingual Textbook onX Gender” written by A.Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu published by Telugu Akademi, Telangana Government in 2015.</li> </ul>		
<p><b>ASSESSMENT AND GRADING:</b></p> <ul style="list-style-type: none"> <li>➤ Discussion &amp; Classroom Participation: 20%</li> <li>➤ Project/Assignment: 30%</li> <li>➤ End Term Exam: 50%</li> </ul>		

## MC310CS: FUNDAMENTALS OF DATA STRUCTURES

**B.Tech. II Year I Semester**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
MC310CS	MC	3	0	0	0	30	70	100
		<b>Contact Classes: 45</b>			<b>Tutorial Classes: Nil</b>		<b>Practical Classes: Nil</b>	

**Prerequisite:** Mathematical Knowledge at pre-university level

**Course Objectives:** The course should enable the students to:

1. Learn the basic techniques of algorithm analysis.
2. Demonstrate searching and sorting algorithms and analyze their time complexities.
3. Implement linear data structures viz. stack, queue and linked list.
4. Demonstrate non-linear data structures viz. tree and graph traversal algorithms.

**Course Outcomes:**

1. Able to understand concepts of data structures.
2. To Implement the queues using Arrays
3. To analyze single linked list
4. Able to apply basic concepts of binary tree
5. To analyze M-Way search trees

**Unit: I**

**INTRODUCTION TO DATA STRUCTURES,  
SEARCHING AND SORTING**

**No. of Classes: 09**

Basic concepts: Introduction to data structures, classification of data structures, operations on data structures; Searching techniques: Linear search and Binary search; Sorting techniques: Bubble sort, selection sort, insertion sort and comparison of sorting algorithms.

**Unit: II**

**LINEAR DATA STRUCTURES**

**No. of Classes: 09**

Stacks: Primitive operations, implementation of stacks using arrays, applications of stacks arithmetic expression conversion and evaluation; Queues: Primitive operations; Implementation of queues using Arrays, applications of linear queue, circular queue and double ended queue (deque).

**Unit: III**

**LINKED LISTS**

**No. of Classes: 09**

Linked lists: Introduction, singly linked list, representation of a linked list in memory, operations on a single linked list; Applications of linked lists: Polynomial representation and sparse matrix manipulation. Types of linked lists: Circular linked lists, doubly linked lists; Linked list representation and operations of Stack and Queue.

**Unit: IV**

**NON LINEAR DATA STRUCTURES**

**No. of Classes: 09**

Trees: Basic concept, binary tree, binary tree representation, array and linked representations, binary tree traversal, binary tree variants, application of trees; Graphs: Basic concept, graph terminology, graph implementation, graph traversals, Application of graphs.

**Unit: V**

**BINARY TREES AND HASHING**

**No. of Classes: 09**

Binary search trees: Binary search trees, properties and operations; Balanced search trees: AVL trees; Introduction to M-Way search trees, B trees; Hashing and collision: Introduction, hash tables, hash functions, collisions, applications of hashing.

**Text Books:**

1. Rance D. Necaise, "Data Structures and Algorithms using Python", Wiley, John Wiley & Sons, INC., 2011.
2. Benjamin Baka, David Julian, "Python Data Structures and Algorithms", Packt Publishing Ltd., 2017.

**Reference Books:**

1. S. Lipschutz, "Data Structures", Tata McGraw Hill Education, 1st Edition, 2008.
2. D. Samanta, "Classic Data Structures", PHI Learning, 2nd Edition, 2004.

**Web References:**

1. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/algorithms\\_basics.htm](https://www.tutorialspoint.com/data_structures_algorithms/algorithms_basics.htm)
2. <https://www.codechef.com/certification/data-structures-and-algorithms/prepare>
3. <https://www.cs.auckland.ac.nz/software/AlgAnim/dsToC.html>
4. <https://online-learning.harvard.edu/course/data-structures-and-algorithms>