ACADEMIC REGULATIONS AND SYLLABUS

CHOICE BASED CREDIT SYSTEM

MLR20

ELECTRONICS AND COMMUNICATION ENGINEERING

For

Bachelor of Technology (B.Tech)

For the batches admitted2020-21

B. Tech. - Regular Four Year Degree Program
(For batches admitted from the academic year 2020 - 21)
&
B. Tech. - Lateral Entry Scheme
(For batches admitted from the academic year 2021 - 22)

MARRI LAXMAN REDDY
GROUP OF INSTITUTIONS

MLR Institute of Technology

(Autonomous)
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FOREWORD

The autonomy is conferred on MLR Institute of Technology by UGC, based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own **curriculum, examination system and monitoring mechanism**, independent of the affiliating University but under its observance.

MLR Institute of Technology is proud to win the credence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, if not improving upon the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, in accordance with the vision and mission of the college in order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought, at appropriate time with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

PRINCIPAL

COURSE STRUCTURE

ECE-II SEM

I YEAR II SEMESTER									
Code	Course	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A5BS03	Integral Calculus and Numerical Techniques	BSC	3	1	0	4	30	70	100
A5BS09	Fundamentals of electronic materials and its applications	BSC	3	1	0	4	30	70	100
A5EE03	Electrical Technology	ESC	3	1	0	4	30	70	100
A5AE70	Engineering Graphics-CAD	ESC	1	0	4	3	30	70	100
A5BS11	Engineering Physics Laboratory	BSC	0	0	3	2	30	70	100
A5EE04	Electrical Technology Laboratory	ESC	0	0	3	2	30	70	100
A5AE71	Engineering Workshop	ESC	0	0	2	1	30	70	100
		TOTAL	**10**	**03**	**12**	**20**	**210**	**490**	**700**
Mandatory Course (Non-Credit)									
A5MC02	**Technical Seminar-II**		**0**	**0**	**2**	**0**	**30**	**70**	**100**

II SEMESTER
SYLLABUS

INTEGRAL CALCULUS AND NUMERICAL TECHNIQUES

I B.TECH II Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5BS03	BSC	3	1	-	4	30	70	100
Contact Classes: 44	Tutorial Classes: 08	Practical Classes: Nil				Total Classes: 52		

Course Objectives

To learn

1. The concepts of finite differences, operators and relations between them.
2. Evaluation of integrals by using numerical methods.
3. Evaluation of the multiple integrals.
4. Fourier series for periodic functions.
5. Fourier transform and inverse transform of common functions.

UNIT-I	INTERPOLATION AND CURVE FITTING	Classes: 11

INTERPOLATION: Finite differences: Forward, Backward and Central differences - Other difference operators and relations between them - Difference of a polynomial – Missing terms - Newton's forward interpolation, Newton's backward interpolation, Gauss's forward and backward interpolation formulae. Interpolation with unequal intervals – Lagrange's interpolation.
CURVE FITTING: Method of least squares - Fitting a straight line, second degree parabola and non-linear curves of theform $y= a e^{bx}$, $y= a x^{b}$, $y = a b^{x}$ by the method of least squares.

UNIT-II	NUMERICAL TECHNIQUES	Classes: 11

ROOT FINDING TECHNIQUES :
Bisection method-RegulaFalsi method and Newton Raphson method.
NUMERICAL INTEGRATION :
Trapezoidal rule - Simpson's one-third rule - Simpson's three-eighth rule.
NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Taylor's series method – Euler's - modified Euler's Method – Runge-Kutta method.

UNIT-III	MULTIPLE INTEGRALS	Classes: 10

Double and triple integrals (Cartesian and polar), Change of order of integration in double integrals, Change of variables (Cartesian to polar) in double integrals. Finding the area and volume of a region using double and triple integral.

UNIT-IV	FOURIER SERIES	Classes:10

Periodic function-Determination of Fourier Coefficients-Fourier Series-Even and Odd functions-Fourier series in arbitrary interval-Even Odd periodic continuation-Half range Fourier sine and cosine expansions.

UNIT-V	FOURIER TRANSFORMS	Classes: 10

Fourier integral theorem (statement)-Fourier sine and cosine integrals –Fourier transforms – Fourier sine and cosine transforms-properties- Inverse transforms-Finite Fourier transforms.

Text Books:

1 .Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.

Reference Books:

1. G.B.Thomas, calculus and analytical geometry,9th Edition, Pearson Reprint 2006.
2. N.P Bali and Manish Goyal ,A Text of Engineering Mathematics,Laxmi publications,2008.
3. E.L.Ince, Ordinary differential Equations,Dover publications,1958.

Web references:

1. https://www.efunda.com/math/math_home/math.cfm
2. https://www.ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -Text Book:

1.https://www.e-booksdirectory.com/details.php?ebook=10166

MOOCS Course:

1.https://swayam.gov.in/
2. https://onlinecourses.nptel.ac.in/

FUNDAMENTALS OF ELECTRONIC MATERIALS AND APPLICATIONS

I B.TECH II Semester: ECE

Course Code:	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5BS09	BSC	3	1	0	4	30	70	100
Contact Classes:44	Tutorial Classes:08	Practical Classes: NIL				Total Classes: 52		

Course Objectives

The course should enable the students to:

1 .Describe the chemical reaction and phase transformation in materials by using modern Thermodynamic models.
2. Learn the fundamentals of transport properties of materials .
3 Describe the interactions of light with materials which results in color and the temperature dependence of magnetic susceptibility.
4. Learn the basic principles of laser and optical fiber.
5. Understand the development of nano technology and synthesis of nano materials by using different techniques.

UNIT-I	The Structure of Materials &Thermodynamics of Condensed Phases	Classes: 10

The Structure of Materials: Introduction – Structure of Metals and Alloys, Structure of Ceramics and Glasses, Structure of Biologics.

Thermodynamics of Condensed Phases: Introduction – Thermodynamics of Metals and Alloys, Thermodynamics of Ceramics and Glasses, Thermodynamics of Biologics.

UNIT-II	Transport Properties of Materials& Band theory of solids	Classes: 12

Transport Properties of Materials: Introduction - Momentum Transport properties of Materials, Heat Transport properties of Materials, Mass Transport properties of materials, Kinetic process-Nucleation and Growth.

Band theory of solids: Free electron theory, Origin of energy band formation in solids, Estimation of Fermi-level, Kronig-Penny model, E-K diagram.

UNIT-III	Properties of materials	Classes: 10

Electrical and Optical properties -Conduction, Semi conductivity, Electrical Conduction in Ionic Ceramics**.**

Reflection, Refraction, Absorption and transmission. Opacity and Translucency in insulators. Light interaction with solids, EMR, atomic and electronic interaction.

Magnetic properties – Introduction, Types of magnetic materials, influence of temperature on magnetic behavior, Hysteresis curve, Soft and Hard magnetic materials, Magnetic storage, Ferrite applications.

UNIT-IV	Optoelectronic devices and optical fibers	Classes: 10

Optoelectronic devices: Introduction to Semiconductors, Properties of photo diodes, Construction and working of Solar cells and its applications, Efficiency issues. Hall effect and its applications.

Fiber Optics: Structure of fibers, TIR, Acceptance angle and NA. Types of fibers – SI and GI fiber properties. Fiber optic communication system with block diagram. Fiber optic sensors – Principle, working of Pressure and Temperature Sensors. Applications of fibers in different fields.

UNIT-V	Introduction to Engineered materials	Classes: 10

Synthesis of Nano materials: Introduction to nano particles, nano scale, properties of nano materials. Techniques for synthesis of nano materials – Sol gel, CVD methods.

Characterization of Nanomaterials: Imaging methods – SEM,TEM and STM. Applications of Nano materials in engineering and Biomedical fields and other fields.

Text Books:

1. Engineering Physics, B.K. Pandey, S. Chaturvedi – Cengage Learing
2. Haliday and Resnick, Physics – wiley
3. P.K Palanisamy, Engineering Physics, Sitech Publications, 2013, IVthEdn.
4. Essentials of Nano Tecnology by Jeremy Ramsden.
5. An introduction to materials engineering and science by Brian S. Mitchell

Reference Books:

1. Hecht, “Optics”, Pearson Education, 2008.
2. D. A. Neamen, “Semiconductor Physics and Devices”, Times Mirror High EducationGroup, Chicago, 1997.
3. Fundamentals of material science and engineering by William D. Callister, Jr. David G. Rethwisch

Web references:

1. https://www.edx.org/course?search_query=semiconductor+physics
2. https://www.edx.org/course/nanotechnology-fundamentals-purduex-nano530x
3. https://www.edx.org/course/physics-electronic-polymers-pep-purduex-nano600

E -Text Books:

1. http://www.phys.sinica.edu.tw/TIGP-NANO/Course/2010_Fall/classnotes/NanoB_week14.pdf
2. https://www.scribd.com/document/70908178/Semiconductor-Devices-Basic-Principles-Jasprit-Singh
3. https://www.scribd.com/doc/105174065/Fundamentals-of-Photonics
4. ftp://nozdr.ru/biblio/kolxo3/P/PE/PEo/Thyagarajan%20K.,%20Ghatak%20A.%20Lasers..%20Fundamentals%20and%20Applications%20(2ed.,%20GTP,%20Springer,%202010)(ISBN%20144196441X)(O)(674s)_PEo_.pdf
5. https://subodhtripathi.files.wordpress.com/2012/01/optical-fiber-communications-by-gerd-keiser_2.pdf
6. http://www.hailienene.com/resources/nano-technology.pdf

MOOC Course

1. http://nptel.ac.in/courses/118104008/1 (Fundamentals of Nano technology)
2. http://nptel.ac.in/courses/118104008/13 (Nano structures, synthesis and characterization)
3. https://nptel.ac.in/courses/113/104/113104096/(mateiral science)
4. https://nptel.ac.in/courses/113/102/113102080/(Metallurgy and material science)

Course Outcomes

The student will able to:

1. Analyze the bonding scheme and its physical properties of a given material.
2. Evaluate the dimensionality, rates of a nucleation and growth process from kinetic data.
3. Evaluate the curie and Neel temperature of a given substance.
4. Justify how the graded index optical fiber is more efficient than step index optical fiber in fiberoptic communication system.
5. Recommend appropriate synthesis method and explain the characterization techniques.

ELECTRICAL TECHNOLOGY

I B.TECH II Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5EE03	ESC	3	1	0	4	30	70	100
Contact Classes: 50	Tutorial Classes: 0	Practical Classes: Nil				Total Classes: 50		

COURSE OBJECTIVES:

The course should enable the students to:

1. Understand basics in electrical circuits with nodal and mesh analysis.
2. Understand the use of circuit analysis theorems and methods.
3. Analyze two port network parameters.
4. Apply Laplace Transform to steady state and transient state response.
5. Study the working principles of electrical machines

UNIT-I	INTRODUCTION TO ELECTRICAL CIRCUITS	Classes: 10

Electrical circuit elements (R, L and C), voltage and current sources, ohm's law, Kirchhoff's current and voltage laws, Source transformations, star-delta connections, nodal and mesh analysis

UNIT-II	NETWORK THEOREMS	Classes: 10

Super position theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Reciprocity theorem, Tellegen's theorem –with DC excitation.

UNIT-III	FILTERS AND TWO PORT NETWORKS	Classes:10

Two port network parameters-Z, Y, ABCD and Hybrid parameters. Interconnection of Two port networks in series, parallel and cascaded connections.

UNIT-IV	TRANSIENT ANALYSIS	Classes: 10

Concept of complex frequency, Analysis of RL, RC, and RLC networks with and without initial conditions using Differential equations and Laplace transforms for DC excitations. Evaluation of initial conditions for various electrical circuits.

UNIT-V	MACHINES	Classes: 10

DC MACHINES: Construction and working of DC generator, EMF equation, types of DC generators and
Working of DC motor, torque equation of DC motor and its types.
AC MACHINES : Construction and working of Transformer and EMF equation, problems, Construction and working principle of Three phase Induction motor.

Text Books:

1. Charles K. Alexander, Matthew N.O. Sadiku, “Fundamentals of Electric Circuit” 5th Edition, Tata McGrawHill New Delhi, 2013
2. Sudhakar, A., Shyammohan, S. P. “Circuits and Network” Tata McGraw-Hill New Delhi, 1994.
3. “Circuit theory analysis and Synthesis” by Abhijit Chakrabarti, DHANPAT RAI & CO.

Reference Books:

1. Van, Valkenburg. “Network analysis” Prentice hall of India, 2000
2. A William Hayt, “Engineering Circuit Analysis” 8th Edition, McGraw-Hill Education
3. N.C.Jagan, C.Lakshminarayana, “Network Theory”, Anshan, 2005.

Course Outcomes

Upon successful completion of the course, the student is able to

1. Use network techniques, like node analysis and mesh analysis, to write equations for linear circuits.
2. Apply network theorems to analyze and design circuits for maximum power transfer.
3. Acquire skills to Analyze Calculate two port network parameters.
4. Calculate the transient and steady state response for dc excitations using Laplace transform
5. Acquire skills to understand working principles of electrical machines.

ENGINEERING GRAPHICS-CAD

I B.TECH II Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE70	ESC	1	-	4	3	30	70	100

COURSE OUTCOMES:

At the end of the course the student should be able to:

1.Sketch the various curves used in engineering and their applications

2.Apply the knowledge of quadrant system and say to which quadrant and angle of project the object belongs.

3.Evaluate the given object position and draw the projections of objects

4. Convert the pictorial views into orthographic view and vice versa.

5.Develop the new drawings for the industry requirements

COURSE OBJECTIVES:

The course should enable the students to:

1. Create awareness and emphasize the need for Engineering Drawing in various branches of engineering.
2. Enable the student with various concepts of dimensioning, conventions and standards related to engineering drawings.
3. Follow the basic drawing standards and conventions.
4. Develop skills in three-dimensional visualization of engineering component.

UNIT-I	INTRODUCTION	Classes: 07

Introduction to Engineering Drawing: Principles of Engineering Graphics and their significance, INTRODUCTION TO COMPUTER AIDED DRAFTING: 2D drawings-simple exercises Engineering Curves: Construction of Ellipse, Parabola and Hyperbola General method only

UNIT-II	DRAWING OF PROJECTIONS OR VIEWS: ORTHOGRAPHIC PROJECTION IN FIRST ANGLE PROJECTION ONLY	Classes: 10

Principles of Orthographic Projections – conventions – first and third angle projections. Projections of points-Projection of lines inclined to both the planes.
PROJECTIONS OF PLANES: Projections of regular planes, inclined to both planes.

UNIT-III	PROJECTION OF SOLIDS AND DEVELOPMENT OF SURFACES	Classes: 08

PROJECTION OF SOLIDS-Solids inclined to both planes(Auxiliary plane method)
DEVELOPMENT OF SURFACE/SOLIDS: Theory of development, development of lateral surface along with base.

UNIT-IV	ISOMETRIC DRAWINGS	Classes: 05
Divisions of pictorial projection, theory of Isometric Drawing- Isometric view and Isometric projections; Drawing Isometric circles, Dimensioning Isometric Objects; Conversion of Isometric view to Orthographic views and Orthographic to isometric views.		
UNIT-V	**3D MODELING**	**Classes: 04**
Types of 3D models, 3D Coordinate Systems, basic commands in 3D, PEDIT command. CREATING SOLID MODELS: creating pre-defined Solid Primitives, Dynamic UCS, methods of creating solids by - Extrude Revolve, Swept, Loft, & Presspull, in 3Dcreating solid models, Dynamic UCS. MODIFYING 3D OBJECTS: Fillet, Chamfer, Rotate, Mirror, Array, and Slicing solid Models. EDITING 3D OBJECTS: SOLVIEW, SOLDRAW, SOLPROF, 3D wire-frame and shaded solids- Commands, Boolean operations. Creation of simple solid models relevant to the domain.		

Text Books:

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
3. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
4. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers .
5. D.M. Kulkarni,A.P.Rastogi,A.K. Sarka “Engineering Graphics with AutoCAD” PHI publications, 2013
6. Computer Aided Engineering Drawing / K Balaveera reddy et al-CBS publishers

Reference Books:

1. Johle (2009), Engineering Drawing, Tata Mc Graw Hill, New Delhi, India.
2. Trymbaka Murthy (2007), Computer Aided Engineering Drawing, I.K. International Publishers, New Delhi.
3. Sham Tickoo, D. saravanan, “AutoCAD 2010 for engineers and designers” Dreamtech Press, 2010
4. Sham Tickoo “ AutoCAD 2011: A Problem solving approach” Autodesk Press, USA.

Web References:

1. nptel.ac.in/courses/112103019/
2. web.iitd.ac.in/~achawla/public_html/201/lectures/sp46.pdf
3. http://www.autocadtutorials.net/

E-Text Books:

1. https://www.researchgate.net/publication/305754529_A_Textbook_of_Engineering_Drawing_A_Textbook
2. https://www.researchgate.net/publication/305754529_A_Textbook_of_Engineering_Drawing

MOOC Course

https://onlinecourses.nptel.ac.in/noc20_me79/preview

ENGINEERING PHYSICS LABORATORY

I B.TECH II Semester: ECE

Course Code:	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5BS11	BSC	0	0	3	2	30	70	100
Contact Classes: 00	Tutorial Classes: 00	Practical Classes: -39				Total Classes: 39		

Course Objectives

The course should enable the students to:

1. To provide an experimental foundation for the theoretical concepts introduced in the lectures.
2. To teach how to make careful experimental observations and how to think about and draw conclusions from such data.
3. To help students understand the role of direct observation in physics and to distinguish between inferences based on theory and the outcomes of experiments.
4. To introduce the concepts and techniques which have a wide application in experimental science but have not been introduced in the standard courses.
5. To teach how to write a technical report this communicates scientific information in a clear and concise manner.

LIST OF EXPERIMENTS

Experiment-1	**Energy gap of P-N junction diode:** To determine the energy gap of a semiconductor diode.
Experiment-2	**Solar Cell:** To study the V-I and P-I characteristics of solar cell.
Experiment-3	**Light emitting diode:** Plot V-I characteristics of light emitting diode Plot V-I characteristics of light emitting diode.
Experiment-4	**Hall effect:**To determine Hall co-efficient of a given semiconductor
Experiment-5	**Meldes Experiment:** To determine the frequency of a tuning fork by using Melde's experiment
Experiment-6	**Optical fiber:** To determine the numerical aperture and acceptance angle of an optical fiber.
Experiment-7	**LASER:** To determine the wavelength of a given laser source by using diffraction grating method.
Experiment-8	**LCR Circuit:** To determine the Resonance frequency and Quality factor of a LCR Circuit.
Experiment-9	**Thermistor:** To determine the temperature of a given material by using Thermistor.

Experiment-10	**Torsional Pendulum:** To determine the rigidity modulus of a given metal wire by using torsional pendulum.
Experiment-11	**R-C Circuit:** To determine the time constant of R-C circuit
Experiment-12	**PIN photo diode:** To determine the V-I characteristics of PIN photo diode.

Reference Books:

1. "Semiconductor Physics and Devices: Basic Principles" by Donald A Neamen.
2. "Optics, Principles and Applications" by K K Sharma.
3. "Principles of Optics" by M Born and E Wolf.
4. "Oscillations and Waves" by Satya Prakash and Vinay Dua.
5. "Waves and Oscillations" by N Subrahmanyam and Brij Lal.

Web References:

1. **http://www.arxiv.org/pdf/1510.00032**
2. http://www nptel.ac.in/courses/122103010/
3. http://www. researchgate.net/.../276417736_Video_Presentations_in_Engineering-Ph...
4. http://www. wileyindia.com/engineering-physics-theory-and-practical.html

Learning Outcomes:

By the end of the course students will be able:

1.Analyze the electric properties of semiconductor material by determining energy gap of semiconductors, threshold voltage of LEDs and efficiency issues of solar cell with careful experimental and draw conclusions from such data.

2. Evaluate the mechanical properties of a given material using dynamic method in torsional pendulum and analyze how stationary waves are produced to determine A.C frequency using Melde's experiment.

3. Estimate the optical properties of fiber by determining acceptance angle, NA of optical fiber and calculate the wavelength of given laser beam by diffraction phenomenon.

4. Analyze the electrical properties by determining Quality factor and resonance frequency of a given circuit and time constant of RC circuit with careful experimental observations and draw conclusions from such data of LCR and RC Circuit.

ELECTRICAL TECHNOLOGY LABORATARY

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5EE04	ESC	0	0	3	2	30	70	100

COURSE OBJECTIVES:

The course should enable the students to:

1. Get an exposure to common electrical components and their ratings.
2. Make electrical connections by wires of appropriate ratings.
3. Understand the usage of common electrical measuring instruments.
4. Understand the basic characteristics of transformers and electrical machines

COURSE OUTCOMES:

Upon successful completion of this course, student will be able to:

1. Analyze the circuit using Kirchhoff's law and network simplification theorems.
2. Evaluate the resonance of series and parallel RLC circuits
3. Evaluate the efficiency of single phase and three phase alternating quantities.
4. Evaluate the line voltage and phase voltage of three phase transformer.
5. Evaluate the efficiency and critical speed and critical field resistance of DC Machine.

LIST OF EXPERIMENTS

WEEK-1	INTRODUCTION AND USE OF MEASURING INSTRUMENTS & SAFETY PRECAUTIONS
To study the usage of electrical instruments and the required precautions to be taken	
WEEK-2	KIRCHOFF'S LAWS(KVL & KCL)
. To verify KVL and KCL	
WEEK-3	SUPERPOSITION THEOREM
To verify superposition theorem	
WEEK-4	THEVENIN'S THEOREM
To obtain equivalent circuit of a complex network	
WEEK-5	NORTON'S THEOREM

To obtain equivalent circuit of a complex network	
WEEK-6	**MAXIMUM POWER TRANSFER THEOREM**
To obtain equivalent circuit of a complex network	
WEEK-7	**OPEN CIRCUIT, SHORT CIRCUIT & LOAD TEST ON SINGLE PHASE TRANSFORMER**
To calculate the efficiency of single phase transformer	
WEEK-8	**CUT OUT VIEW OF DC MACHINE**
Demonstration on constructional and cut out view of dc machine	
WEEK-9	**CUT OUT VIEW OF INDUCTION MOTOR**
Demonstration on constructional and cut out view of single phase induction motor	
WEEK-10	**MAGNETIZATION CHARACTERISTICS OF DC SHUNT GENERATOR**
To draw the open circuit characteristics of dc shunt generator	
WEEK-11	**BRAKE TEST ON DC SHUNT MOTOR**
To find the torque-speed characteristics of dc shunt motor.	
WEEK-12	**BRAKE TEST ON 3-PHASE INDUCTION MOTOR**
To find the torque-slip characteristics of induction motor	

Reference Books

1. Department Lab Manual
2. A.Chakrabarthi, " Circuit Theory", Dhanpat Rai Publications, 6th Edition,2006
3. V K Mehta, Rohit Mehta, "Principles of Electrical Machines", S Chand Publications, 1st Edition,2006
4. I Nagrath & DP Kothari, "Electrical Machines", Mcgraw Hill Education Publications, 4th Edition, 2010.

Web References:

1. http://www.ee.iitkgp.ac.in
2. http://www.citchennai.edu.in

ENGINEERING WORKSHOP

I-B.TECH -II SEMISTER-ECE

Course Code	Category	Hours / Week			Credit	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE71	ESC							

		-	-	2	1	30	70	100
Contact Classes:	**Tutorial Classes: Nil**	**Practical Classes: 28**				**Total Classes:28**		

COURSE OBJECTIVES:

Student will

I. Get the hands on experience on various trades.

II. Capable to make useful products using one or more operations.

COURSE OUTCOMES:

Student should be able to:

I. Fabricate components with their own hands
II. Get practical knowledge of the dimensional accuracies and tolerances.
III. Produce small devices of their interest

WEEKS	BASIC TRADES
	Fitting
Week 1	Filing Four Sides of Work piece
Week 2	L- Fit
	Carpentry
Week 3	Half Lap Joint
Week 4	Dove Tail Joint
	Tin Smithy
Week 5	Tin Smithy- Prepare a Rectangular Tray
Week 6	Prepare A Square Tin
	Electrical
Week 7	House Wiring Parallel and Series Connection
Week 8	House Wiring Two Way Switch
	Electronics
Week 9	Soldering Parallel Connection
Week 10	Soldering Series Connection
Week 11	Useful product using 3 or more operations