



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech. / Metallurgical and Materials Engineering		
Course Title	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING		
Course Code	EEIR11	No. of Credits	2
Course Code of Pre-requisite subject(s)	NIL	--	--
Session	July 2023	Section (if, applicable)	--
Name of Faculty	M. VENKATESWARLU	Department	EEE
Email	<u>407122002@nitt.edu</u>	Telephone No.	8939305263
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail	NA	Telephone No.	NA
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>DC & AC Circuits: Current, voltage, power, Kirchhoff's law – circuits elements R,L and C, Phasor diagrams, impedance, real and reactive power in single phase circuits.</p> <p>DC & AC Machines: DC Motor, Induction motor, synchronous motor, synchronous generator and transformer - construction, principle of operation, types and application.</p> <p>House wiring & Safety – Single phase and three phase system – phase, neutral and earth, basic house wiring - important tools and components, different types of wiring –staircase, florescent lamp & ceiling fan, basic safety measures at home & industry.</p> <p>Analog Electronics: semiconductor devices – pn diode, zener diode, BJT and operational amplifier – principle of operation and applications – Introduction to UPS.</p> <p>Digital Electronics: Introduction to number systems, basic boolean laws, reduction of Boolean expressions and implementation with logic gates.</p> <p>Text/Reference Books:</p> <ol style="list-style-type: none"> 1. Hughes revised by Mckenzie Smith with John Hilcy and Keith Brown, "Electrical and Electronics Technology", 8th Edition, Pearson, 2012. 2. P. S. Dhogal, "Basic Electrical Engineering – Vol. I & II," 42nd Reprint, Mc Graw Hill, 2012. 3. A.E. Fitzgerald, D. E. Higginbotham, A. Grabel, "Basic Electrical Engineering", 5th Edition, McGraw-Hill, 1985. 4. A. P. Malvino, D. P. Leach and Gowtham Sha, "Digital Principles and Applications," 6th Edition, Tata Mc Graw Hill, 2007. 5. Vincent Del Toro, "Electrical Engineering Fundamental", Prentice Hall India, 2012. 			
COURSE OBJECTIVES			
<p>The course aims to equip the students with a basic understanding of electrical circuits and machines for specific types of applications. The course gives a comprehensive exposure to house wiring. This course also equips student with an ability to understand basics of analog and digital electronics.</p>			

COURSE OUTCOMES (CO)

The students shall develop an intuitive understanding of the circuit analysis, basic concepts of electrical machines, house wiring and basics of electronics and be able to apply them in practical situation.

COURSE PLAN – PART II**COURSE OVERVIEW**

We are living in a modern world where all the systems are interconnected and interdependent with electrical sciences. By the year 2050, the demand of electrical energy will be double or even become triple due to the advancement in modern technology. Now-a-days, a minimum knowledge is essential in the field of electrical sciences for better understanding of electrical appliances irrespective of the discipline of undergraduate program.

The content of this course is framed such that to serve the introductory part of the subject, electrical engineering. The basic concepts of electrical sciences will be introduced with practical connectivity wherever applicable.

This course primarily deals with the basic understanding of Electric circuits and its uses. Further the course introduces various electric motors used in various applications and their characteristics. Basic domestic wiring will be introduced to the students at the mid of this course with practical exposure. Understanding of analog and digital logic circuit will be dealt at introductory level at the end of this course.

In all the five modules of this course, essential emphasis is given to numerical computation. During this course, it is planned to make a hands-on experience with domestic wiring.

COURSE TEACHING AND LEARNING ACTIVITIES




S.No.	Week/Contact Hours	Topic	Mode of Delivery (On-line – MS TEAMS)
1.	Week 1 28-08-23 to 01-09-23 (2 Contact Hour)	<ul style="list-style-type: none"> DC & AC Circuits: Current, voltage, power, Kirchhoff's Laws 	Lecture- Chalk and Talk / PPT
2.	Week 2 04-09-23 to 08-09-23 (2 Contact Hours)	<ul style="list-style-type: none"> circuit elements R, L and C, phasor diagram, impedance, 	Lecture- Chalk and Talk / PPT
3.	Week 3 11-09-23 to 15-09-23 (2 Contact Hours)	<ul style="list-style-type: none"> real and reactive power in single phase circuits. DC Motor construction, principle of operation, types and applications 	Lecture- Chalk and Talk / PPT
4.	Week 4 18-09-23 to 22-09-23 (2 Contact Hours)	<ul style="list-style-type: none"> Transformer construction, principle of operation, types and applications Induction Motor construction, principle of operation, types and applications 	Lecture- Lecture- Chalk and Talk / PPT
5.	Week 5 25-09-23 to 29-09-23 (2 Contact Hours)	<ul style="list-style-type: none"> Synchronous Motor construction, principle of operation, types and applications Introduction to single phase and 	Lecture- Lecture- Chalk and Talk / PPT

		three phase system wiring	
6.	Week 6 02-10-23 to 06-10-23 (1 Contact Hours)	<ul style="list-style-type: none"> • phase, neutral and earth, basic house wiring 	Lecture- Lecture- Chalk and Talk / PPT
7.	Week 7 09-10-23 to 13-10-23 (2 Contact Hours)	<ul style="list-style-type: none"> • tools and components, different types of wiring – staircase, florescent lamp ceiling fan, • basic safety measures at home and industry 	Lecture- Lecture- Chalk and Talk / PPT
8.	Week 8 16-10-23 to 20-10-23 (2 Contact Hours)	<ul style="list-style-type: none"> • Introduction to UPS • semiconductor devices – p-n junction diode principle of operation and applications 	Lecture- Lecture- Chalk and Talk / PPT
9.	Week 9 23-10-23 to 27-10-23 (1 Contact Hours)	<ul style="list-style-type: none"> • Zener diode, • BJT principle of operation and applications 	Lecture- Lecture- Chalk and Talk / PPT
10.	Week 10 06-11-23 to 10-11-23 (2 Contact Hours)	<ul style="list-style-type: none"> • operational amplifier • Introduction to numbers systems 	Lecture- Lecture- Chalk and Talk / PPT
11.	Week 11 13-11-23 to 17-11-23 (2 Contact Hours)	<ul style="list-style-type: none"> • basic Boolean laws • reduction of Boolean expressions 	Lecture- Lecture- Chalk and Talk / PPT
12.	Week 12 20-11-23 to 24-11-23 (2 Contact Hours)	<ul style="list-style-type: none"> • implementation with logic gates • topics left out/ revision 	Lecture- Lecture- Chalk and Talk / PPT
13.	Week 13 27-11-23 to 01-12-23 (1 Contact Hours)	<ul style="list-style-type: none"> • topics left out/ revision 	Lecture- Lecture- Chalk and Talk / PPT
14.	Week 14 04-12-23 to 08-12-23 (2 Contact Hours)	<ul style="list-style-type: none"> • topics left out/ revision 	Lecture- Lecture- Chalk and Talk / PPT

If any contact hour is NOT handled on a particular day due to unseen reasons, an extra class will be scheduled on the same week based on the time available

COURSE ASSESSMENT METHODS (shall range from 4 to 6) – ON-line

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment-1	Week – 6	60 minutes	20
2	Assessment-2	Week – 10	60 minutes	20
3	Assessment-3 (Group Task)	--	--	5
4	Surprise tests	--	--	10
4	Submission of Assignments	--	--	5
CPA	Compensation Assessment (Written Test – for A-1 and A-2 only)	Week -14	60 minutes	Maximum of 20

5	Descriptive Type Examination	15 th Dec. – 22 nd Dec. 2023	180 Minutes	40
COURSE EXIT SURVEY				
<ul style="list-style-type: none"> • Students feedback through class committee meetings • Feedback questionnaire from students – twice during the semester • Feedback from students on the course outcomes shall be obtained at the end of the course 				
COURSE POLICY				
<u>MODE OF CORRESPONDENCE</u>				
<ol style="list-style-type: none"> 1. All the students are advised to check their webmail regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through webmail only. 2. Queries (if required) to the course teacher shall only be emailed to 407122002@nitt.edu 				
<u>COMPENSATION ASSESSMENT POLICY</u>				
CPA will be offered only for the students who could not appear for Assessments 1 and/or 2.				
<u>ATTENDANCE POLICY</u>				
<ol style="list-style-type: none"> 1. All the students are expected to attend all the contact hours. Students should maintain 75% minimum physical attendance by the end of the course to attend the end semester examination. 2. Students with less than 75% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' Grade. Students must REDO the course. 3. A maximum of 10% attendance shall be allowed in the On Duty (OD) category. OD is allowed only for the students having minimum attendance of 65%. 				
<u>ACADEMIC DISHONESTY & PLAGIARISM</u>				
<ul style="list-style-type: none"> ➤ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty. ➤ The answer sheet of the student will not be evaluated and ZERO mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark. ➤ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office. 				
ADDITIONAL INFORMATION				
The faculty is available for consultation at times as per the intimation given by the faculty. Queries may also be emailed to the Course Coordinator directly at 407122002@nitt.edu				
FOR APPROVAL				
 (M. VENKATESWARLU) Course Faculty		 CC-Chairperson		 HOD

Date:- 04/09/2023 .