NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Department of Electrical and Electronics Engineering

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**	**02**
Course Code of Pre-requisite subject(s)	**NIL**		
Session	**July 2019**	**Section (if, applicable)**	**NA**
Name of Faculty	**Dr. N. Kumaresan**	**Department**	**EEE**
Official Email	**nkumar@nitt.edu**	**Telephone No.**	**0431-2503257**
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		**Telephone No.**	
Course Type (please tick appropriately**)**	☑ **Core course**	☒ **Elective course**	

Syllabus (approved in BoS)

DC & AC Circuits: Current, voltage, power, Kirchhoff's Laws - circuit elements R, L and C, phasor diagram, impedance, real and reactive power in single phase circuits.

DC & AC Machines: DC Motor, Induction motor, Synchronous motor, Synchronous generator and Transformers- construction, principle of operation, types and applications.

House wiring & safety: Single phase and three phase system – phase, neutral and earth, basic house wring - tools and components, different types of wiring – staircase, florescent lamp and ceiling fan, basic safety measures at home and industry.

Analog Electronics: semiconductor devices – p-n junction diode, Zener diode, BJT, operational amplifier – principle of operation and applications – Introduction to UPS.

Digital Electronics: Introduction to numbers systems, basic Boolean laws, reduction of Boolean expressions and implementation with logic gates.

Text Books

1. Hughes revised by Mckenzie Smith with John Hilcy and Keith Brown, 'Electrical and Electronics Technology', 8th Edition, Pearson, 2012.

Reference Books

1. R.J. Smith, R.C. Dorf, 'Circuits Devices and Systems', 5th Edition, John Wiley and sons, 2001.
2. P. S. Dhogal, 'Basic Electrical Engineering – Vol. I & II', 42nd Reprint, Mc Graw Hill, 2012.
3. Malvino, A. P., Leach D. P. and Gowtham Sha, 'Digital Principles and Applications', 6th Edition, Tata Mc Graw Hill, 2007.
4. Vincent Del Toro, 'Electrical Engineering Fundamental', Prentice Hall India, 2002.

COURSE OBJECTIVES
This 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 students with an ability to understand basics of analog and digital electronics.

MAPPING OF COs with POs	
Course Outcomes	**Programme Outcomes (PO) (**Enter Numbers only**)**
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

Students get exposure to the fundamental of electrical devices and circuits. Students will be taught about the principle of operation and applications of several electrical machines. Students will understand the house wiring and electrical safety techniques and have an opportunity to make a practical attempt on house wiring. Further they will be exposed to basics of analog and digital electronic devices, circuits and simple applications.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1.	3rd Week of August (19th to 23rd August) (**2 Contact Hours)**	DC Circuits, Current, Voltage, Power, Kirchhoff's Laws	Lecture / Tutorial C&T/ Document viewer
2.	4th Week of August (26th to 30th August) **(2 Contact Hours)**	AC Circuit, RMS & Peak of Sinewave, Circuit Elements, R L C Series Circuit, Phasor Diagram, Impedance	
3.	1st and 2nd Week of September (3rd to 13th September) **(3 Contact Hours)**	Real and Reactive Power in Single Phase Circuit – Examples from circuits	
4.	3rd Week of September (16th to 20th Sept.) **(2 Contact Hours)**	DC Motor & Induction Motor	Lecture C&T/ PPT or any suitable mode
5.	4th Week of September (23rd to 27th Sept.) **(2 Contact Hours)**	Synchronous Generator & Motor	
6.	5th Week of September & 1st week of Oct (30th Sept. to 4th Oct) **(2 Contact Hours)**	Transformer **ASSESSMENT – 1**	
7.	2nd Week of October (7th to 11th October) **(1 Contact Hours)**	Analog Electronics : Semiconductor Devices, PN Junction Diode, Zener Diode, BJT	Lecture C&T/ PPT or any suitable mode
8.	3rd Week of October (14th to 18th October) **(2 Contact Hours)**		

S.No.	Week/Contact Hours	Topic	Mode of Delivery
9.	4th Week of October (21st to 25th October) **(2 Contact Hours)**	Operational Amplifier, Introduction to UPS	Lecture C&T/ PPT or any suitable mode
10.	5th Week of October (28th Oct to 1st Nov) **(2 Contact Hours)**	Digital Electronics : Number Systems, Boolean Laws	
11.	2nd Week of November (4th to 8th November) **(2 Contact Hours)**	Reduction of Boolean Expression and implementation with logic gates **ASSESSMENT – 2**	
12.	3rd Week of November (11th to 15th November) **(2 Contact Hours)**	House wiring & safety: Single phase and three phase system – phase, neutral and earth, basic house wring - tools and components, different types of wiring – staircase, florescent lamp and ceiling fan, basic safety measures at home and industry	**Wring Practice / seminar / Team Task**
13.	4th Week of November (18th to 22nd Nov.) **(3 Contact Hours)**		
14.	5th Week of November (25th to 29th Nov.) **(3 Contact Hours)**	**CPA**	
15.	**2nd / 3rd Week of December**	**Final Assessment**	**Written Test**

C & T : Chalk and Talk ;
PPT : Power Point

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment 1 : Written Test (First 2 Units)	1st week of October	60 Minutes	20
2	Assessment 2 : Written Test (Last 2 Units)	2nd week of November	60 Minutes	20
3	Wring Practice / seminar / Team Task	3rd to 5th Week of November	--	20
CPA	Compensation Assessment Written Test	Last week of November	60 Minutes	Please refer course policy for more details
4	Final Assessment: Written Test (All Units)	2nd / 3rd Week of December	120 Minutes	40

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Feedback from the students during class committee meetings

Anonymous feedback through questionnaire

COURSE POLICY (including compensation assessment to be specified)

1. Attending all the assessments (i.e., Assessment 1 to 4) are MANDATORY for every student.
2. If any student is not able to attend Assessment-1 / Assessment-2 due to genuine reason, he/she is permitted to attend the Compensation Assessment (CPA) with 20% weightage (20 marks). At any case, CPA will not be considered as an improvement test.
3. Grading will be based on the clusters (range) of the total marks (all the assessments i.e., Assessment 1 to 4, put together for each student) scored. For grading, Gap theory or Normalized curve method will be used to decide the clusters (range) of the total marks.
4. The passing minimum shall be as per the Office of the Dean (Academic) instructions. Hence, every student is expected to score the minimum mark to pass the course as prescribed by the Office of the Dean (Academic). Otherwise the student would be declared fail and 'F' grade will be awarded.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- 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.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail as well as informed during the class.
2. Queries (if required) may be emailed to me / contact me during 04.00 pm to 05.00 pm on Monday with prior intimation for any clarifications.

FOR APPROVAL

Course Faculty Sivaraman 16/8/19 CC- Chairperson HOD

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective