NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN – PART I			
Name of the program and specialization	**B.Tech. Civil 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-2023**	**Semester/Section (if, applicable)**	**I – Sec B**
Name of Faculty	**Dr. Bukke Chandrababu Naik**	**Department**	**ECE**
Official Email	**chandrababu@nitt.edu**	**Telephone No.**	**+91-7396065605**
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.

Reference:

1. Hughes revised by Mckenzie Smith with John Hiley and Keith Brown, Electrical and Electronics Technology, 8th Edition, Pearson, 2012.
2. R.J. Smith, R.C. Dorf, Circuits Devices and Systems, 5th Edition, John Wiley and sons, 2001.
3. P. S. Dhogal, Basic Electrical Engineering – Vol. I & II, 42nd Reprint, McGraw Hill, 2012.
4. Malvino, A. P., Leach D. P. and Gowtham Sha, Digital Principles and Applications, 6th Edition, Tata McGraw Hill, 2007.
5. Vincent Del Toro, Electrical Engineering Fundamental, Prentice Hall India, 2002.

COURSE OBJECTIVES
This course aims to equip the students with a basic understanding of DC and AC circuits. The course introduces the students to the core concepts behind DC and AC motors, their principles of operation, and applications. Further, the house wiring and safety measures are comprehensively exposed to the students. Also, the course equips the students with the understanding of basic analog and digital electronics.

MAPPING OF COs with POs	
Course Outcomes	**Programme Outcomes (PO) (**Enter Numbers only**)**
The students shall develop and intuitive understanding of basic concepts of DC and AC circuits.	2,3,6
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.	1,2,3,4,6,8,10
Generalize the design techniques and analyze the characteristics of diodes, BJT and all other electronic devices and be able to apply them in practical situation.	5,11
Describe and verify the methods to solve Boolean functions.	11,12

COURSE PLAN – PART II
COURSE OVERVIEW
Students get exposure to the fundamentals of electrical devices and circuits. Students will be taught about the principles 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 (Add more rows)

S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	**1st Week Two hours**	Current, voltage, power, Kirchhoff's Laws, Circuit elements R, L and C	**C&T/PPT/Digital Writing pad**
2	**2nd week Two hours**	Phasor diagram, impedance, real and reactive power in single phase circuits.	**C&T/PPT/Digital Writing pad**
3	**3rd week Two hours**	Transformers - Construction, principle of operation, types and applications.	**C&T/PPT/Digital Writing pad**
4	**4th week Two hours**	DC Motor - Construction, principle of operation, types and applications.	**C&T/PPT/Digital Writing pad**

5	**5th week Two hours**	Induction motor - Construction, principle of operation, types and applications.	**C&T/PPT/Digital Writing pad**
6	**6th week Two hours**	Synchronous motor, Synchronous generator - Construction, principle of operation, types and applications.	**C&T/PPT/Digital Writing pad**
7	**7th week Two hours**	Single phase and three phase system – phase, neutral and earth, House wiring tools and components, different types of wiring with examples.	**C&T/PPT/Digital Writing pad**
		Assessment – 1 (Descriptive)	**Written/Objective/Both**
8	**8th week Two hours**	Different types of wiring – staircase, florescent lamp, and ceiling fan, basic safety measures at home and industry.	**C&T/PPT/Digital Writing pad**
9	**9th week Two hours**	Introduction to semiconductor and semiconductor devices and types. PN junction diode operation. Characteristics of diode and application.	**C&T/PPT/Digital Writing pad**
10	**10th week Two hours**	Zener diode - Characteristics, Introduction to BJT, different configuration of BJT and application.	**C&T/PPT/Digital Writing pad**
11	**11th week Two hours**	Operational amplifier - Principle of operation and applications, Introduction to UPS.	**C&T/PPT/Digital Writing pad**
		Assessment – 2 (Descriptive)	**Written/Objective/Both**
12	**12th week Two hours**	Introduction to numbers systems, basic Boolean laws	**C&T/PPT/Digital Writing pad**
13	**13th week Two hours**	Reduction of Boolean expressions and implementation with logic gates.	**C&T/PPT/Digital Writing pad**
14	**End Semester Assessment (Descriptive)**		**Written/Objective/Both**
	C&T – Chalk and Talk, PPT – Power point		

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment – 1 (Descriptive- 1 & 2 units)	As per academic calendar	60 mins	20%
2	Assessment – 2 (Descriptive- 3 & 4 units)	As per academic calendar	60 mins	20%
3	Assessment – 3 Assignments/Quiz – **Online mode/submission** (Institute Procedure-Modules1-4)	Will be announced in the class		10%
CPA	Compensation Assessment* (Modules 1-4 units)	As per academic calendar	60 mins	
4	Final Assessment* (Descriptive- 1-5 units)	As per academic calendar	180 mins	50%

***mandatory; refer to guidelines on pages 4, 5, and 6**

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

Feedback from the students through MIS and class committee meetings.

COURSE POLICY (including compensation assessment to be specified**)**

MODE OF CORRESPONDENCE (email/phone etc.)

All the students are advised to check their NITT WEBMAIL/MS Teams regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in Class/MS Teams only.

ASSESSMENT POLICY

1. Attending all the assessments is MANDATORY for every student.
2. If any student is not able to attend any of the Continuous Assessments due to genuine reason, student is permitted to attend the **compensation assessment*** (CPA) with Corresponding weightage. (This is not valid for students who have attendance lag also.)
3. Please refer institute B. Tech Regulations/guidelines for grading policy.

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

Queries may also be emailed to the course faculty directly at **chandrababu@nitt.edu.**

FOR APPROVAL

Course Faculty 11/09/23 **CC- Chairperson** 11/09/23 **HOD**