NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE PLAN – PART I				
Name of the programme and specialization	B.Tech. - Chemical Engineering (First Year)			
Course Title	**Basics of Electrical and Electronics Engineering**			
Course Code	EEIR11		No. of Credits	2
Course Code of Pre-requisite subject(s)	——			
Session	July 2023		Section (if, applicable)	
Name of Faculty/Incharge	Mr. Prashant Khare		Department	Electrical And Electronics Engineering
Official Email	407121008@nitt.edu		Telephone No.	6232892720
Name of Course Coordinator(s) (if, applicable)				
Course Type (pleasetick 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 wiring - 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.

Essential Readings

1. Hughes revised by Mckenzie Smith with John Hilcy 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, Mc Graw Hill, 2012.
4. Malvino, A. P., Leach D. P., and Gowtham Sha, 'Digital Principles and Applications', 6th Edition, Tata Mc Graw Hill, 2007.
5. Vincent Del Toro, 'Electrical Engineering Fundamental', Prentice Hall India, 2002.

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COURSE OBJECTIVES

The course aims to provide a foundational understanding of electrical and electronics principles, covering basic circuit analysis, Machines, House wiring, and Digital and Analog electronics. Students will gain proficiency in solving circuit problems, comprehending electronic devices, and fostering a solid groundwork for further engineering studies.

COURSE OUTCOME (CO)

Course Outcome	Aligned Programme Objectives
The students shall develop an intuitive understanding of circuit analysis, basic concepts of electrical machines, house wiring, and the basics of electronics and be able to apply them in practical situations.	——

COURSE PLAN –PART II

COURSE OVERVIEW

This course is designed to provide students with a solid understanding of Electrical and Electronics Engineering. Students will Understand circuit analysis and the behavior of components in DC and AC circuits, learn about motors, generators, and their applications in various industries, gain practical knowledge of safe and efficient residential wiring systems, and be exposed to the basics of analog and digital electronics.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1.	Week 1 – Week 4	For Session Reporting and Orientation	
2.	Week 5 28-August – 01 September 2023 (2 contact hours)	Introduction to Basics of Electrical and Electronics Engineering. Basics of DC Circuits and Circuit Elements	Lecture, Chalk, and talk/PPT
3.	Week 6 04-08 September - 2023 (2 contact hours)	Kirchhoff's Laws. Analysis of AC Circuits, Phasor Diagram, Impedance, Power factor.	Lecture, Chalk, and talk/PPT
4.	Week 7 11-15 September - 2023 (2 contact hours)	Construction, Principle of Operation, Type, and Application of • DC Motor • DC Generator	Lecture, Chalk, and talk/PPT
5.	Week 8 18-12 September -2023 (2 contact hours)	Construction, Principle of Operation, Type, and Application of • Transformer • Induction Motor	Lecture, Chalk, and talk/PPT
6.	Week 9 25-29 September -2023 (0 contact hours)	Academic Break	
7.	Week 10 02-06 October -2023 (1 contact hours)	Assessment -I	Written Test

8.	Week 11 09-13 October -2023 (2 contact hours)	Construction, Principle of Operation, Type, and Application of Synchronous Motor.	Lecture, Chalk, and talk/PPT
9.	Week 12 16-20 October -2023 (2 contact hours)	House Wiring – Important Tools and Components.	Lecture, Chalk, and talk/PPT
10.	Week 13 23-27 October -2023 (2 contact hours)	Types of House Wiring and Safety Measures. Single-phase and Three-phase Systems.	Lecture, Chalk, and talk/PPT
11.	Week 14 30-31 October -2023 (1 contact hours)	Assessment -II	Written Test
12.	Week 14 01-03 November -2023 (1 contact hours)	Introduction to Analog Electronics, Semiconductor Devices, Type of Diodes.	Lecture, Chalk, and talk/PPT
13.	Week 15 06-10 November -2023 (2 contact hours)	BJT Operation and Applications.	Lecture, Chalk, and talk/PPT
14.	Week 16 13-17 November -2023 (2 contact hours)	Operational amplifiers and UPS	Lecture, Chalk, and talk/PPT
15.	Week 17 20-24 November -2023 (1 contact hours)	Introduction to Digital Electronics	Written Test
16.	Week 18 27-November – 01 December 2023 (1 contact hours)	Boolean Laws and Expressions.	Lecture, Chalk, and talk/PPT
17.	Week 19 04-08 December -2023 (2 contact hours)	Logic Gates and Applications	Lecture, Chalk, and talk/PPT
18.	Week 20 11-15 December -2023	Final Assessment	Written Test

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	1st class test	Week 10 02-06 October -2023	50 minutes	20
2.	2nd class test	Week 14 30-31 October -2023	50 minutes	20
3.	Surprise tests/Assignments/Seminars/ Home works/Other Learning Activities	Continuous Evaluation (Throughout the semester)		20
CPA	Compensation Assessment	Week 17 20-24 November -2023	50 minutes	20

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4.	Final Assessment	Week 20 11-15 December - 2023	180 minutes	40

COURSE EXIT Survey

- Feedback from the students during class committee meetings.
- Anonymous feedback through the questionnaire.
- End semester feedback on Course Outcomes.

COURSE POLICY (including compensation assessment to be specified)

1. Attending all the assessments is MANDATORY for every student.
2. One compensation assessment will be conducted for those students who are being physically absent for assessments 1 and/ or 2, only for valid reasons.
3. In any case, CPA will not be considered as an improvement test.
4. Absolute/Relative grading will be adopted for the course

ATTENDANCE POLICY

- 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% 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, and copyingfrom others during an assessment will be treated as punishable dishonesty.
- Zero marks 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 to all the programme.

FOR APPROVAL

Course Faculty----------CC-Chairperson----------HOD