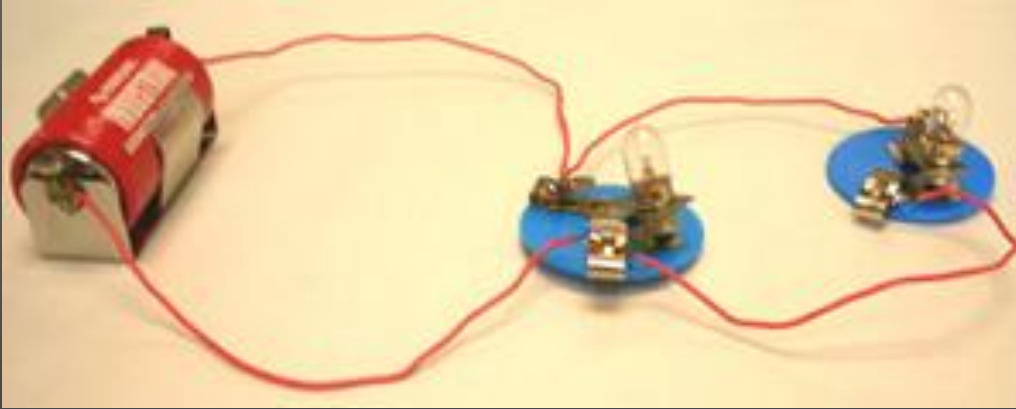


BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

FE 130

Ms. Shivani S. Lotlikar

ELECTRICAL ENGINEERING



Module I

- DC Circuits
- Magnetic Circuits
- Networks

Module II

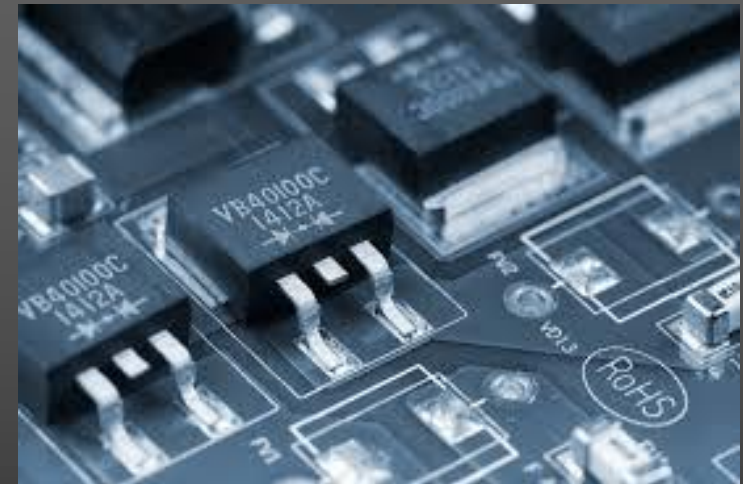
- AC Fundamentals
- Three Phase systems
- Transformers



ELECTRONICS ENGINEERING

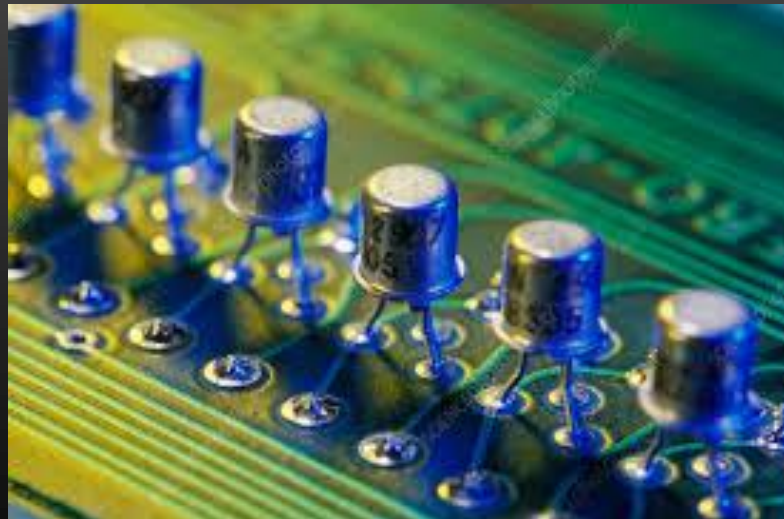
Module III

- Diodes
- Rectifiers
- SCR



Module IV

- Bipolar junction Transistor
- FET
- CMOS
- IGBT



EXAMS

INTERNAL TESTS

- IT1
- IT2
- IT3

1 hour paper (1-1 $\frac{1}{2}$ Module)

25 Marks each

Best two

Min: 10 marks

SEMESTER EXAM

5 questions

Part A(2) + Part B(2) + Part C(1)

3 hours paper

100 marks

Min: 40 marks

Passing marks = 10+40 = 50 marks

No Grace marks

4. COURSE OVERVIEW



a.	Course Name: Basic Electrical and Electronics Engineering			
b.	Course Code: FE130			
c.	Course Instructor: Shivani S. Lotlikar			
d.	Semester and Year offered Sem: I Year: 11 th October 2021 - 29 th January 2022 (RC 2019)			
e.	Total Student Learning Time (SLT)	Face to Face		
	L = Lecture T = Tutorial P = Practical	L 40	T	P Guided: 40 hours (12 weeks) P : 0
f.	Course Objectives <i>The subject aims to provide the student with:</i> <ol style="list-style-type: none"> 1. An understanding of different energy sources, single phase transformer concepts and laws related to electric and magnetic circuits. 2. An ability to perform analysis of DC and AC circuits. 3. An understanding of the operation and characteristics of diodes, transistors and SCRs. 4. An ability to analyse rectifiers, voltage regulators, transistors and transformer circuits. 			

g.	Course Outcomes (CO) Upon completion of this course, students should be able to		
	CO	CO Description	Cognitive Level (CL)
	FE130.1	Explain the energy sources, single phase transformer concepts, laws related to electric and magnetic circuits.	CL 2
	FE130.2	Analyze DC circuits using network theorems, single phase and 3 phase circuits.	CL 3
	FE130.3	Explain the operation and characteristics of diodes, transistors and SCRs.	CL 2
	FE130.4	Analyze rectifiers, regulators and transistors and transformer circuits.	CL 3

i.

Assessment Methods and Type

Assessments of learning are based on a variety of information sources:

Assessment Methods		Assessment Type	Plan / Dates
Internal Assessments	Internal Tests (IT)	Written Exam	IT1 : November IT2 : January IT3 : January
	Assignments	Written Assignments	*Refer to Assignment table
External Final Examination	Exam	Written exam	7 th February to 28 th February

n.	Syllabus:
Unit	TOPICS
1	Introduction to Energy sources, DC Circuit Analysis: Kirchoff's laws, Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum Power transfer theorem. Batteries, series and parallel connection of Batteries, Battery specifications. Magnetism: Related terms, B-H curve, Faraday's Laws, Lenz's Law, Analogy between Electrical and magnetic circuits, Solenoid.
2	A.C Fundamentals: Analysis of R, L, C, R-L, R-C, RLC circuits, Concept of active power, reactive power, apparent power. Three phase systems. Star and Delta connection, current voltage and power relationship. Single phase transformer: Construction, principle of operation, efficiency, voltage regulation.
3	Diodes and Circuits: PN junction diode, V-I characteristics, Zener diode, breakdown mechanism in diodes, light emitting diode. Diode Applications: Half-wave, Full-wave and Bridge Rectifiers, PIV; DC and r.m.s voltages, Ripple Factor. Voltage regulation using Zener diodes. SCR: construction, V-I characteristics, operation and phase control applications.
4	Bipolar Junction Transistor (BJT): Construction; Operation, Transistor Amplifying Action; Common-Emitter Configuration; Common-Collector Configuration; Limits of Operation. DC Biasing: Operating Point, Fixed-Bias Circuit; Emitter-Stabilized Bias Circuit; Voltage-Divider Biasing. Field Effect Transistors: Construction and Characteristics of JFETs; Transfer Characteristics; Depletion-Type MOSFET; Enhancement-Type MOSFET, CMOS. IGBT- Construction and characteristics.
5	<p>TEXTBOOKS</p> <ol style="list-style-type: none"> 1. Vincent Del Tero; Principles of Electrical Engineering by; PHI Publication. 2. Joseph Administer; Electrical Circuits; Schaum Series Publication. 3. Hayt, Kemmerly, Durbin ;Engineering Circuit Analysis; Tata McGraw Hill Publication. <p>REFERENCES</p> <ol style="list-style-type: none"> 1. Rajendra Prasad; Fundamentals of Electrical Engineering; PHI Publication. 2. Boylestad and L. Nashelsky; Electronic Devices and Circuits; PHI 3. A. Mottershead; Electronic Devices and Circuits; PHI. 4. N.N.Bhargava; Basic Electronics and Linear Circuits; Tata McGraw-Hill. 5. Vijay Baru, Rajendra Kaduskar, Sunil Gaikwad; Basic Electronics Engineering; Dreamtech Textbooks.



Engineering Study

Syllabus

Reference Books

Semester papers

Calculator (991Ms/ 991 Es)

Assignments