

Academic Course Description

BHARATH University
 Faculty of Engineering and Technology
 Department of Electrical and Electronics Engineering

BEE101 Basic Electrical and Electronics Engineering
First Semester (Odd Semester)

Course (catalog) description

This course introduces to the concepts and definitions of Ohms law, KCL, KVL, power and energy. By applying Kirchhoff's current and voltage laws to circuits in order to determine voltage, current and power in branches of any circuits excited by DC voltages and current sources. Apply simplifying techniques to solve DC circuit problems using basic circuit theorems and structured methods like node voltage and mesh current analysis. This course also introduces the basic electronics components like Logic gates, Flip lops etc. This course also introduces the construction and operating principle of AC machines, DC machines, Generators and Transformers.

Compulsory/Elective course : Compulsory for all circuit branch students
Credit & Contact hours : 2 and 30 hours
Course Coordinator : Mr.K.Sakthivel, Asst. Professor
Instructors : Mrs.K.Venkateswari

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@bharathuniv.ac.in)	Consultation
Mrs.K.Venkateswari	All First Year Students	FIRST YEAR MAIN BULIDING	04422290125	hod.eee@gmail.com	9.00-9.50 AM

Relationship to other courses:

Pre –requisites : +2 Level Mathematics, Physics

Assumed knowledge : The students will have a physics and mathematics background obtained at a high school (or Equivalent) level. In particular, working knowledge of basic mathematics including Differentiation, integration and probability theories are assumed.

Syllabus Content

UNIT I ELECTRIC CIRCUITS

6

Ohm's law – Kirchoff's Laws, V – I Relationship of Resistor (R) Inductor (L) and capacitor (C). Series parallel combination of R, L&C – Current and voltage source transformation – mesh current & node voltage method –superposition theorem –Thevenin's and Norton's Theorem -Problems.

UNIT II ELECTRICAL MACHINES

6

Construction, principle of operation, Basic Equations and applications - D.C.Generators and D.C.Motors. - Single phase Induction Motor - Single Phase Transformer.

UNIT III BASIC MEASUREMENT SYSTEMS

6

Introduction to Measurement Systems, Construction and Operating principles of PMMC, Moving Iron, Dynamometer Wattmeter, power measurement by three-watt meter and two watt method – and Energy meter.

UNIT IV SEMICONDUCTOR DEVICES

6

Basic Concepts of semiconductor devices – PN Junction Diode Characteristics and its Applications – HWR, FWR – Zener Diode – BJT (CB, CE, CC) configuration & Characteristics.

UNIT V DIGITAL ELECTRONICS

6

Number system – Logic Gates – Boolean Algebra– De-Morgan’s Theorem – Half Adder & Full Adder – Flip Flops.

Computer usage: Nil

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	100%
Professional subject	-	0%

Broad area: Circuit Theory | Electronics | Transmission Lines and Networks | Linear Integrated Circuits

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 1 st week	Session 1 to 13	2 Periods
2	Cycle Test-2	September 2 nd week	Session 14 to 24	2 Periods
3	Model Test	October 2 nd week	Session 1 to 30	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To develop problem solving skills and understanding of circuit theory through the application of techniques and principles of electrical circuit analysis to common circuit problems. This course emphasizes:	Correlates to program outcome		
	H	M	L
1. To develop an understanding of the fundamental laws and elements of electric circuits.	b,c,d,j	a,f,k	e,g

2. To develop the ability to apply circuit analysis to DC and AC circuits	b,c,f	a,d,g,h	j
3. To understand the measuring instruments of electrical quantities and its constructions.	a,d,e	b,g	j,k
4. Introduce students to construction of machines.	a,d,e	b,g,h,k	f,j
5. To learn the working operation of logic gates, flip flops and registers	e	a,b,c,d,g	j,k

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I ELECTRIC CIRCUITS			
1.	Circuit elements, Ohms Law	Yes	[T1]
2.	Kirchhoff's Law – V-I Relationship of R,L and C	Yes	
3.	Series parallel combination of R, L&C	No	
4.	mesh current & node voltage method	Yes	
5.	superposition theorem	Yes	
6.	Thevenin's theorem	Yes	
7.	Norton's Theorem -Problems.	Yes	
UNIT II ELECTRICAL MACHINES			
8.	Construction of DC motor	No	[T1]
9.	Principle of operation DC motor	No	
10.	Basic Equations and applications of DC machines	Yes	
11.	Construction and operation of DC generator	No	
12.	Single phase Induction Motor	No	
13.	Single Phase Transformer	No	
UNIT III BASIC MEASUREMENT SYSTEMS			
14.	Introduction to Measurement Systems	No	[T1]
15.	Construction and Operating principles of PMMC	No	
16.	Construction and Operating principles of PMMI-Moving Iron	No	
17.	Dynamometer Wattmeter	No	

18.	power measurement by three-watt meter	No	
19.	two watt method – and Energy meter.	No	
UNIT IV SEMICONDUCTOR DEVICES			
20.	Basic Concepts of semiconductor devices	No	[T1]
21.	PN Junction Diode Characteristics and its Applications	No	
22.	HWR, FWR	No	
23.	Zener Diode	No	
24.	BJT- CB, CE, CC configuration	No	
UNIT V DIGITAL ELECTRONICS			
25.	Number system	No	[T1]
26.	Logic Gates	No	
27.	Boolean Algebra	No	
28.	De-Morgan's Theorem	No	
29.	Half Adder & Full Adder	No	
30.	Flip Flops	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by: Mrs. K.Venkateswari

Dated :

Addendum

ABET Outcomes expected of graduates of B.Tech / EEE / program by the time that they graduate:

- a) An ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) An ability to identify, formulate, and solve engineering problems.
- c) An ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) An ability to design and conduct experiments, as well as to analyze and interpret data.
- e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- f) An ability to apply reasoning informed by the knowledge of contemporary issues.
- g) An ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- h) An ability to understand professional and ethical responsibility and apply them in engineering practices.
- i) An ability to function on multidisciplinary teams.
- j) An ability to communicate effectively with the engineering community and with society at large.
- k) An ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- l) An ability to recognize the need for ,and an ability to engage in life-long learning.

Program Educational Objectives

PEO1: PREPARATION

Electrical Engineering Graduates are in position with the knowledge of Basic Sciences in general and Electrical Engineering in particular so as to impart the necessary skill to analyze and synthesize electrical circuits, algorithms and complex apparatus.

PEO2: CORE COMPETENCE

Electrical Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics related to power, information and electronics hardware.

PEO3: PROFESSIONALISM

Electrical Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL

Electrical Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS

Electrical Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

BEE101-BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Course Teacher	Signature
K.Venkateswari	

Course Coordinator

(K.Venkateswari)

HOD/EEE

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