

19EE102 BASIC ENGINEERING PRODUCTS

Hours Per Week :

L	T	P	C
2	-	2	3

Total Hours :

L	T	P	W/RA	SSH/HS	CS	SA	S	BS
30	-	30	5	40	-	8	5	-



SOURCE:

<http://sazehpardazi.ir/wp-content/uploads/2017/01/Mokran-tank.jpg>

COURSE DESCRIPTION AND OBJECTIVES:

This course enable the students to understand the basics of civil, mechanical, electrical and electronics systems and components used in day-to-day life. It deals with construction materials, power generation principles and working of a few commonly used household appliances. Besides, the student will be able to identify/appreciate various concepts, service and maintenance of engineering products.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes.

COs	Course Outcomes	POs
1	Describe the working principle of IC engine, refrigeration and air conditioning systems.	1,2,6
2	Gain awareness on choosing appropriate construction materials.	1,2,6
3	Install, operate, maintain and troubleshoot basic electrical engineering appliances.	1,2 3,4,6
4	Analyze the different lighting sources and it's features.	1, 2, 6
5	Know the basic electronics engineering appliances.	1, 2, 6

SKILLS:

- ✓ *Trouble shoot issues relating to air conditioning and refrigeration systems.*
- ✓ *Testing the quality of different construction materials.*
- ✓ *Identify UPS requirements for a given load.*
- ✓ *Design a composition of heating element for a particular application.*
- ✓ *Provide an earthing for domestic outlet.*
- ✓ *Select, Configure and maintain a few engineering appliances. Such as TV, Radio, Telephone, Mobile phone, Wifi Router, Micro oven, PA system etc.*

ACTIVITIES:

- *Trouble shooting of immersion heater and induction heaters.*
- *Disassemble and Assemble the Domestic Appliances such as Mixer Grinder, Fan etc.*
- *Provide Earthing for Domestic Outlet.*
- *Design the Electric Wiring system for a prototype house.*
- *Design the UPS for a defined load.*
- *Practice assembly of a FM radio.*
- *Configure a Wifi Router for required number of users.*

UNIT - I**L - 6**

WORKING PRINCIPLE OF AC, REFRIGERATOR, PUMPS, IC ENGINES AND SCREW JACK: Working principle of Air Conditioner and Refrigerator, Components, Assembly and disassembly; Working principle of centrifugal and reciprocating pumps - types, parts and applications; Working principle of screw jack and its components, Working principle of IC engines - 2 stroke and 4 stroke.

UNIT - II**L - 6**

BRICKS: General, Qualities and Classification of bricks, Tests for bricks, Size and weight of bricks, Timber - Definition, Qualities of good timber, Decay of timber and advantages of timber in construction.

CEMENTS: Types and composition of cement, Setting of cement, Tests for physical properties of cement, Different grades of cement.

AGGREGATES: Classification of aggregates, Source, Size and shape of aggregates, Tests for aggregates.

STEEL: Types of steel, Physical properties and Mechanical properties of steel, Simple layout design, Paints, Tiles, fittings, Ventilation, Furniture and green house aspects.

UNIT - III**L - 6**

POWER GENERATION: Overview of power system structure, Conventional and Non-conventional power generation sources.

PROTECTION SCHEMES: Earthing procedure, Switch fuse unit (SFU), MCB. Methods of electrical wiring systems.

ENERGY STORAGE SYSTEMS: Types of batteries, Important characteristics for batteries; Elementary calculations for energy consumption.

UNINTERRUPTIBLE POWER SUPPLY (UPS) : Components in UPS, Functionality, Calculation of ratings for UPS components to a specific load.

UNIT - IV**L - 6**

LIGHT: Working of Incandescent, Fluorescent, MV, SV and LED Lamps, Comparison and applications.

HEAT: Resistance and induction heating, Comparison and applications.

MOTOR: Motors used in domestic applications, Mixer grinder, Ceiling fan, Hair dryer, Washing machine, Air coolers, Vacuum cleaner and Electric vehicle.

UNIT - V**L - 6**

HOUSE HOLD ELECTRONIC APPLIANCES: Working principles of Television, Radio, Remote control, Telephone, Microwave oven, Cell phone, PA system, WiFi router and DTH.

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS

TOTAL HOURS: 30

Demonstration of Modelling / functioning / disassembly / assembly / fault rectification / understanding of the following.

1. Air-conditioners and Refrigerators.
2. 2 Stroke and 4 Stroke Engines.
3. Reciprocating Pumps.
4. Power Screw Jack.
5. Size and Water absorption capacity of Bricks.
6. Initial and final setting time of Cement.
7. Toughness value of coarse aggregates.
8. Bulking of Sand.
9. Earthing Schemes.
10. Electric Wiring.
11. UPS system.
12. Immersion Heater and Iron Box.
13. Induction Heater.
14. Ceiling Fan and Mixer.
15. Washing Machine.
16. Incandescent and Fluorescent lamps.
17. Television and Remote Control.
18. Microwave oven.
19. Telephone and Mobile Phone.
20. PA System.

TEXT BOOKS:

1. M.S. Shetty, "Concrete Technology", 1st edition, S. Chand & Co., 2005.
2. S.C. Rangwala, "Engineering Materials", 36th edition, Charotar Publishing House, 2009.
3. Govindasamy and A. Ramesh, "Electrical Engineering - Electrical Machines and Appliances Theory, 1st edition, Tamilnadu Text Book Corporation, 2010.

REFERENCE BOOKS:

1. Janakaraj and A. Sumathi, "Electrical Engineering - Electrical Machines and Appliances Theory", 1st edition, Tamilnadu Text Book Corporation, 2011.
2. Marshall Brain, "How Stuff Works", 1st edition, John Wiley & Sons, 2001.
3. Pravin Kumar, "Basic Mechanical Engineering", 1st edition, Pearson Publishers, 2013.