

ENGINEERING MATERIALS

Week	Period	Topics	Subtopics	Methodology
1 st	1 st	1.1 Define engineering materials. 1.2 Mention the classification of engineering materials in different technology 1.3 List the characteristics of engineering materials. 2.1 Define building stones.	1.1-2.1	Lecture & Discussion
	2 nd	2.2 Mention geological, physical and chemical classification of stones. 2.3 List the characteristics of good building stones 2.4 Describe the dressing of stones. 2.5 Describe the uses of stone in engineering filed.	2.2-2.5	Lecture & Discussion
	Practical	1.1. Selected different type of stone in the laboratory.		
2 nd	1 st	3.1 Define brick. 3.2 Mention different constituents for manufacturing of good bricks. 3.3 Explain pug mill, table molding and machine molding.	3.1-3.3	Lecture & Discussion
	2 nd	3.4 Describe the process of brick drying. 3.5 Describe the methods of kiln burning of brick. 3.6 Draw the sketches Bull's trench kiln & Hoffman's kiln.	3.4-3.6	Lecture & Discussion
	Practical	1.2. Sketch different type of stone on the basis of formation.		
3 rd	1 st	4.1 Mention the classification of sand according to their sources. 4.2 Mention the specifications of good sand. 4.3 Describe the purpose of grading of sand.	4.1-4.3	Lecture & Discussion
	2 nd	1 st Quiz Test		Question & Answer
	Practical	2.1. Perform field test of bricks 2.2. Select 1 st class , 2 nd class, 3 rd class bricks and jhama bricks		
4 th	1 st	4.4 Mention the use of various grades of sand.5.1 Define cement. 5.2 Mention the functions of various ingredients of cement. 5.3 Distinguish between wet process and dry process of manufacturing Portland cement. 5.4 Draw a flow diagram based on wet process of manufacturing of cement.	4.4-5.4	Lecture & Discussion
	2 nd	5.5 Mention the uses of cement as engineering material. 6.1 Identify the following tiles: clay tiles, concrete tiles, Plastic tiles, Mosaic tiles, Marble tiles, Glazed tiles. 6.2 Describe the uses of different kinds of tiles.	5.5-6.2	Lecture & Discussion
	Practical	3. Show skill in conducting laboratory test of bricks 3.1. Perform: (a) Compression test (b) Absorption test 3.2. Determine average weight of a brick.		
	1 ^s	7.1 Explain the important properties of light metal (aluminum/white metal) as construction material. 7.2 Mention the uses of aluminum white/metals . 7.3 Describe the advantages and disadvantages of using aluminum as construction material.	7.1-7.3	Lecture & Discussion

5th	2 nd	1 st Class test		
	Practical	4.1. Conduct laboratory tests of cement (a) Make cement paste of Normal Consistency(CPNC) (b) Determine initial setting time (c) Perform final setting time		
6th	1 st	8.1 Mention the constituents of glass. 8.2 List the properties of glass. 8.3 Mention the uses of glass. 8.4 Describe the constituents of ceramics. .8.5 Mention the classification of ceramics. 8.6 List the properties of ceramics. 8.7 Describe the uses of ceramics in engineering field	8.1-8.7	Lecture & Discussion
	2 nd	2 nd Quiz test		Question & Answer
	Practical	4.1 (d) Perform compressive strength test (e) Perform tensile strength test (f) Perform fineness test 4.2. Conduct field tests of cement		
7th	1 st	8.5 Mention the classification of ceramics. 8.6 List the properties of ceramics. 8.7 Describe the uses of ceramics in engineering field 9.1 Define paints and varnish. 9.2 Explain the characteristics of good paint.	8.5-9.2	Lecture & Discussion
	2 nd	9.3 List the essential constituents of paint. 9.4 Explain the functions of pigment. 9.5 List the main constituents of varnishes. 9.6 Explain the characteristics of good varnish. 9.7 Mention the functions of vehicle. 9.8 Describe synthetic materials used for paint and varnishes.	9.3-9.8	Lecture & Discussion
	Practical	5.(a) Specific gravity of sand (b) Grading of aggregates		
8th	Mid Term Examination			
9th	1 st	10.1 Define timber. 10.2 Mention the classification of trees depending on botanical groups. 10.3 Explain conservation of timber in various market forms. 10.4 Describe the major defects in timber. 10.5 Describe the advantages and disadvantages of using timber in the engineering field. 10.6 Describe the characteristics of good timber. 11.1 Mention the functions of insulating materials.	10.1-11.1	Lecture & Discussion
	2 nd	11.2 List five natural heat insulating materials. 11.3 Mention the names of synthetic insulating materials.	11.2-11.8	Lecture & Discussion

		11.4 Describe the sources of obtaining rubber, cork and ebonite. 11.5 Describe the uses of asbestos as insulating material. 11.6 List three natural sound absorbing materials. 11.7 Mention the names of five sound absorbing materials. 11.8 Explain light weight concrete used in acoustic works.		
	Practical	6. (a) Bulking of sand (b) F M of sand (c) Specific gravity of sand		
10th	1 st	3rd Quiz test		Question & Answer
	2 nd	12.1 Mention the term of fire proofing materials and water proofing materials. 12.2 Explain the uses of asbestos as fire and waterproof materials. 12.3 List the characteristics of refractory materials. 12.4 Explain the uses of rubber as water proofing material. 13.1 Define the term fuel and lubricants. 13.2 Mention the main purposes of fuels with their classifications.	12.1-13.2	Lecture & Discussion
	Practical	7.1. Identify mild steel, cast iron, copper, and aluminum, tin by physical observation.		
11th	1 st	13.3 List different types of lubricants. 13.4 Explain the characteristics of lubricating oils. 14.1 Define plastic. 14.2 List the names of raw materials for plastic. 14.3 Explain the properties of plastic. 14.4 Mention the characteristics of thermoplastic and thermosetting plastic	13.3-14.4	Lecture & Discussion
	2 nd	14.5 Describe the manufacturing process of plastic. 14.6 Explain the molding methods of plastic products. 14.7 Identify the uses of plastic as engineering materials. 14.8 Explain laminating plastic. 15.1 Name the common types of iron used in industry. 15.2 Mention the uses of wrought iron and cast iron.	14.5-15.2	Lecture & Discussion
	Practical	4th Quiz Test 8. Show skill in identifying various type fuels and lubricants		Question & Answer
12th	1 st	15.3 Mention the classification of steel on the basis of carbon content. 15.4 List the names of commercial steels. 15.5 Describe alloy steel. 15.6 Mention the uses of various alloy steels. 15.7 Define non-ferrous metals.	15.3-15.7	Lecture & Discussion
	2 nd	2nd class test		
	Practical	9. Show skill in identifying various types of conducting & non conducting, semi conduction, magnetic and optical fiber materials.		
13th	1 st	15.8 List the important non-ferrous metals used in engineering field. 15.9 Mention the uses of non-ferrous metals and alloys like copper, zinc, tin, lead, brass and bronze. 16.1 List of least three items for conducting, none conducting and semi-conducting materials.	15.8-16.2	Lecture & Discussion

		16.2 Describe the uses of semi-conducting materials.		
	2 nd	16.3 Name the types of soft and hard magnetic materials. 16.4 Mention the uses of optical fiber. 16.5 Mention the uses of Gallium Arsenide Materials.	16.3-16.5	Lecture & Discussion
	Practical	Review of classes		