Semester – I

Subject Name: Civil Engineering Materials

Subject Code: 09CI1101

Objective of the Course:

The main objective to give the course engineering material is

- To familiar students with the properties, use and selection of various materials for engineering purposes

Credits Earned: 5 Credits

Course Outcomes: After completion of this course, student will be able to

- Recognize material and its properties for engineering use
- Interpret the values of mechanical and other properties for selection of the material
- Understand the importance of material selection for various aspects

Pre-requisite of course: NA.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
4	0	2	5	50	30	20	25	25	150

Detailed Syllabus:

Sr. No	Topic name	Hours
1	**Introduction/manufacturing process of construction materials like:**	**12**
	Cement, mortar, bitumen, sand, plywood, stone, lime, timber, steel, rolled section and reinforcing bars.	

2	**Mechanical and physical properties of:**	**12**
	Cement, aggregate, brick, concrete, timber, ferrous and non-ferrous metals, Fly ash block, AAC Block, CLC Block.	
3	**Use of below materials in engineering discipline in structure:**	**12**
	Cement, aggregate, brick, concrete, timber, ferrous and non-ferrous metals, Repair materials like FRP, Epoxy, Polymer mortar etc.	
4	**Criteria for material selection in engineering projects:**	**8**
	Strength, stiffness, durability, fire resistance, waterproofness, thermal insulation, electrical resistance, impact resistance, aesthetic appearance, economy and safety against theft.	
5	**Project Based Learning & Presentation** 1. Demonstration of material selection for unit of furniture or machine component like (fan/chair) 2. Power point presentation (15 minutes, @ 10-15 slides) on the Introduction, types, manufacturing, properties and use of the material (different for all students)	**8**
	Total	**52**

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
20%	40%	40%	10%	00%	00%

Suggested experiment & Project Work:

1) Brick test Dimensions.
2) Brick test for Effloresce and water absorption
3) Compressive strength of bricks
4) Field test to check quality of cement.
5) Fineness modulus of cement

6) Aggregate: Bulking of sand test.
7) Tensile strength of MS bar.
8) Compressive strength of wood with parallel grain and perpendicular grain.
9) Visit of the hardware shop and collect the price of all the materials
10) Visit of the brick manufacturing plant.
11) Visit of Ready Mix Concrete plant.

Instructional Method and Pedagogy:

1. Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.
2. Attendance and discipline is compulsory in lectures and laboratory which carries a 10% component of the overall evaluation.
3. Emphasis is given on hands on training, Hence continuous evaluation of the Project/term-work carries the 60% of the weight age and rest of the 30% marks are for viva-voice exams
4. No Theory exam will be conducted.
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 30%.
6. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. Minimum 8 experiments are planned based on the course content.

Text books :

Engineering Materials by S.C. Rangwala, Charotar Pub House, Anand

Material Science by Narula Gupta

Material science by B.K Dutta, D. Mandal, S.C. Panigrahi.