

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CIVIL ENGINEERING)
SEMESTER	2
COURSE TITLE	CIVIL ENGINEERING MATERIALS
COURSE CODE	09CI2101
COURSE CREDITS	4

Objective:

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

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

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

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction/manufacturing process of construction materials Cement, mortar, bitumen, sand, plywood, stone, lime, timber, steel, rolled section and reinforcing bars	12
2	Mechanical and physical properties Cement, aggregate, brick, concrete, timber, ferrous and non-ferrous metals, Fly ash block, AAC Block, CLC block.	12
3	Use of materials in engineering discipline in structure Cement, aggregate, brick, concrete, timber, ferrous and non-ferrous metals, Repair materials like FRP, Epoxy, Polymer mortar etc	10
4	Criteria for material selection in engineering projects: Strength, stiffness, durability, fire resistance, waterproofness, thermal insulation, electrical resistance, impact resistance, aesthetic appearance, economy and safety against theft.	8
Total Hours		42

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	experiment Brick test Dimensions: Measure dimensions of 10 bricks and find average dimension and weight, Brick test for Effloresce and water absorption, Compressive strength of bricks, Field test to check quality of cement., Fineness modulus of cement, Aggregate: Bulking of sand test., Tensile strength of MS bar., Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60,40, 20,10 mm), Visit of the hardware shop and collect the price of all the materials, Civil site visit (RMC plant / Brick Manufacturing plant), Prepare the cement mortar of proportion 1:3 or 1:6 using artificial sand as a special processed construction material	42
Total Hours		42

Textbook :

- 1 Building Materials, , Duggal s.k., New Age International Publishers, 2018

References:

- 1 Civil Engineering Materials, Civil Engineering Materials, S. K. Kataria and Sons, Made Easy Publications, 2004
- 2 Building Materials, Building Materials, Varghese, P. C, PHI Learning Private Limited, 2015
- 3 Building Construction, Building Construction, B. C. Jain, Ashok Kumar , Jain, Arun Kumar, , Laxmi Publications (p) Ltd, 2008
- 4 Handbook on Civil Engineering, Handbook on Civil Engineering, ., Made Easy Publications, 2023
- 5 Engineering Materials, Engineering Materials, S.C. Rangwala, Charotar Pub House, Anand, 2015

Suggested Theory Distribution:

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

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
40.00	40.00	20.00	0.00	0.00	0.00

Instructional Method:

- 1 Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.

Instructional Method:

- 2 Attendance and discipline are 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 Assignments or tasks based on course content will be given to the students and will be evaluated at regular interval. It carries a weightage of 30%.
- 5 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.

Supplementary Resources:

- 1 <https://nptel.ac.in/courses/105/102/105102088/>
- 2 <https://theconstructor.org/>
- 3 <https://www.engineeringcivil.com/>
- 4 <https://www.youtube.com/channel/UCiunfudMsIhCj9bgY2gK8Og>
- 5 <https://aboutcivil.org/>
- 6 Building Materials - Civil Engineering Questions and Answers (indiabix.com)