



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Bachelor of Engineering**

**Subject Code: 3172214**

**Semester – VII**

**Subject Name: Dimensional Stone Technology**

**Type of course:** Undergraduate

**Prerequisite:** Zeal to learn the subject

**Rationale:** The course is designed to help the student in understanding the different methods to mining and processing also extraction methods of dimensional stone. They can know about various properties of dimensional stone and various machines to use for extraction of dimensional stone.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

**Content:**

Sr. No.	Content	Total Hrs
1	Resources of Marble, Granite, Slate, Sandstone and Limestone as Dimensional stones in India vis a vis world, uses, marketing, export. Procedure for obtaining mining lease and other legal aspects, preparation of project proposal.	08
2	Geology, geographical distribution and characterization of dimensional stones; Prospecting exploration and reserve estimation of dimensional stone.	14
3	Various dimensional stone excavation operations, comparison of different extraction techniques, energy requirement for mechanised stone quarries.	14
4	Mining machinery used for dimensional stone mining and processing.	08
5	Environmental impact of mining and processing of dimensional stones, secondary use of quarried land and waste of the industry.	04

**Suggested Specification table with Marks (Theory):**

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
64%	18%	12%	2%	2%	2%



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**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## Text / Reference Books:

Sr. No.	Author	Title of Books	Publication
1	Rathore S. S., Bhardwaj G. S., Jain S. C	Dimensional Stone Technology	Himanshu Publication New Delhi
2	Rathore S. S., Laxminarayana V	Safety and Technology in Marble Mining and Processing in New Millennium	Proc. Of National Workshop
3	Rathore S. S., Gupta Y. C., Parmar R. L	Recent Development in Machinery and Equipment for Dimensional Stone Mining	
4	India Stones	Business Magazine on Indian Stone Industry	ICONZ Communications, Bangalore

## Course Outcomes:

After learning the course the students should be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	To understand the different methods to mining and processing also extraction methods of dimensional stone.	40
CO-2	They can know geological distribution of it and know various properties and machines to use for extraction of dimensional stone.	40
CO-3	To know the marketing and exporting of dimensional stone.	10
CO-4	To know effective utilization of waste generate during excavation of dimensional stone in industry.	10

## List of Experiments:

Following experiments are suggested for Laboratory work

Sr. No	Practical /Exercise	Approx. Hours Required
1	Dimensional stone resources of the country: Marble, Granite, Sandstone, Flaggy limestone, Slate.	4
2	Determination of Rock Mass Rating (RMR) of various Dimensional Stones.	4



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3	Constructional and Operational features of Chain-saw cutting Machine.	4
4	Constructional and Operational features of Belt-saw cutting Machine.	4
5	Constructional and Operational features of Diamond Gang-saw cutting Machine.	4
6	Various abrasives used in dimensional stone processing & their application.	4
7	Study of various machineries used for excavation, transportation and processing of dimensional stone.	4
<b>Total</b>		<b>28</b>

### Important Note:

80 % From above suggested laboratory work should be covered and remaining 20 % is as per facility available at Department

### Design based Problems (DP)/Open Ended Problem:

Visit to a mines and study the operation and working of various machineries use for excavation and processing for dimensional stone.

### Major Equipment:

1. Jack Hammer
2. Air compressor
3. Hydraulic jack
4. Air bags
5. Hydro bags
6. Laboratory model of derrick crane
7. Laboratory model of mobile crane