



**Mehran University of Engineering and Technology, Jamshoro**  
**Department of Civil Engineering**

<b>Title of Subject</b>	:	<b><u>Geometrical Drawing (Th + Pr)</u></b>	
<b>Code</b>	:	CE102	
<b>Discipline</b>	:	Civil Engineering (1 <sup>st</sup> Semester)	
<b>Effective</b>	:	20-Batch and onwards	
<b>Pre-requisite</b>	:	Nil	<b>Co-requisite: Nil</b>
<b>Assessment</b>	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination	
<b>Credit Hours</b>	:	02 + 01	<b>Marks : 50 + 50</b>
<b>Minimum Contact Hours:</b>		30 + 45	

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**Course Learning Outcomes (CLOs):**

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	PREPARE orthographic projections of points, lines, planes and solids.	C3	1
2	<b>PRACTICE orthographic projections of points, lines, planes and solids.</b>	P3	1
3	MAKE isometric view of solids.	P4	1

**Course outline:**

● **Introduction**

Drawing instruments and their use, Types of lines, Dimensioning and planning of a drawing sheet, Standard drafting conventions, Principal requirements of Geometric Drawing.

● **Projections**

Orthographic projection of points in quadrants, First and third angle projections, Orthographic projection of lines and planes in simple and inclined positions, Traces, Basic solids, Axes of prisms and cylinders inclined to both reference planes, Isometric projections, Free hand isometric sketches of solids.

**Practical work to be carried out:**

1. To know about different drawing instruments & their usage in geometrical drawing and introduction of HSE measures.
2. To draw the projection of points, when point is in 1st and 2nd quadrant.
3. To draw the projection of points, when point is in 3rd and 4th quadrant.
4. To draw the projection of straight lines parallel to both planes.
5. To draw the projection of straight lines parallel to one & perpendicular to another plane.
6. To draw the projection of straight lines parallel to one & inclined to another plane.
7. To draw the projection of straight lines inclined to both planes.
8. To draw the projection of inclined lines with horizontal traces.
9. To draw the projection of inclined lines with vertical traces.
10. To draw the projection of perpendicular planes.
11. To draw the projection of oblique planes.
12. To draw the projection of solids in simple position.



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13. To draw the projection of solids inclined to reference planes.
14. To draw the isometric projection of solids.
15. To perform an open-ended lab.

**Recommended Books:**

- Engineering Drawing, Bhatt ND, Charotar Publishing House India. Latest Edition
- Engineering Drawing and Geometry, Hoelscher RP and Springer CH, John Wiley & Sons, Inc., U.S. Latest Edition

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**Approval:**

**Board of Studies:**

**Resolution No. 32.3**

**Dated: 03-10-2020**

**Board of Faculty:**

**Resolution No. 20.11**

**Dated: 07-10-2020**

**Academic Council:**

**Resolution No. 98.7(ii)**

**Dated: 22-10-2020**



**Mehran University of Engineering and Technology, Jamshoro**  
**Department of Civil Engineering**

<b>Title of Subject</b>	:	<b><u>Civil Engineering Materials (Th + Pr)</u></b>	
<b>Code</b>	:	CE106	
<b>Discipline</b>	:	Civil Engineering (1 <sup>st</sup> Semester)	
<b>Effective</b>	:	20-Batch and onwards	
<b>Pre-requisite</b>	:	Nil	<b>Co-requisite:</b> Nil
<b>Assessment</b>	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination	
<b>Credit Hours</b>	:	03 + 01	<b>Marks :</b> 100 + 50
<b>Minimum Contact Hours:</b>		45 + 45	

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**Course Learning Outcomes (CLOs):**

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	EXPLAIN various materials and their physical characteristics used in different types of civil engineering works.	C2	1
2	ILLUSTRATE the suitability of different materials and their behaviour for their use in civil engineering projects.	C3	4
3	PRACTICE various laboratorial and field tests to obtain physical properties of different materials.	P3	4

**Course outline:**

- **Bricks and Tiles**  
General characteristics, Varieties, Manufacturing, Strength tests, Uses.
- **Building Stone**  
Quarrying, Dressing, Varieties, Strength tests, Uses.
- **Aggregates**  
Characteristics and classifications, Fineness modulus, Strength and durability, Quality tests of aggregates.
- **Cement**  
Manufacturing, Properties and uses of cement, Types of cement, Quality tests
- **Lime**  
Composition, Manufacturing, Varieties, Uses
- **Concrete**  
Composition, Varieties, Properties, Tests and uses
- **Timber**  
Varieties and uses, Identification, Methods of seasoning and sawing, Decay and preservation of timber, Laminated materials
- **Glass**  
Composition, Varieties, Properties, Uses.
- **Metals and Alloys**  
Manufacturing, characteristics, strength and uses of different metals & alloys, Ferrous and non-ferrous metals and alloys, Iron and its types, Reinforcing steel bars, copper, tin, zinc, lead, aluminium, nickel, brass and bronze, Induced corrosion and methods of corrosion control, Cathodic protection, epoxy coats, antirust compounds. Galvanizing
- **Pipes and Sheets**



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Pipes, their types and uses, Plain and corrugated sheets.

- **Paints and Plasters**

Composition, Preparation, Properties, Tests, Uses of paints, plasters, Varnishes and distempers.

- **Other Materials**

Composition, preparation, tests and uses of Bitumen, Asphalt, Tar, Plastics, Fibre Glass, Epoxy, Bearing Pads, Resin materials, Laminates, Adhesive, Asbestos, Gypsum.

#### **Practical Work to be carried out:**

1. a). Introduction to the “Material Testing Laboratory” and HSE (Health, Safety and Environment) measures.  
b). To introduce the Civil Engineering Materials which are most commonly used for construction.
2. To determine the Particle Size Distribution of Coarse Aggregates by Sieve Analysis Method and to determine Fineness Modulus of Coarse Aggregates
3. To determine the Particle Size Distribution of Coarse Aggregates by Sieve Analysis Method and to determine Fineness Modulus of Fine Aggregates
4. To determine Specific Gravity and Water Absorption of Coarse Aggregate.
5. To determine the Bulking of Sand.
6. To determine the Efflorescence of a Burnt Clay Brick by Efflorescence test.
7. To determine the “Water Absorption” percent by mass of Burnt Clay Bricks.
8. To determine the Compressive Strength of a Burnt Clay Brick Using Universal Testing Machine (UTM).
9. To determine the Dimension Tolerance Test of a Burnt Clay Brick.
10. To determine the Fineness of Ordinary Portland Cement (OPC) by Sieving Through IS.75 / BS.200 / ASTM.200 Sieve.
11. To determine the Normal Consistency of Ordinary Portland Cement (O.P.C) by Using Vicat's Apparatus (VA) With Plunger Attachment
12. To determine the Initial and Final Setting Time of Cement Paste by Vicat's Apparatus with Different Needle Attachment.
13. To determine the Diameter, Unit Weight and Bending of Steel bar, the Yield Strength, Proportional Limit, and Ultimate Strength for Steel Bar.
14. To determine the impact resistance of tiles.
15. To perform an open-ended lab.

#### **Recommended Books:**

- Engineering Material and their application, Flinn. Richard. A Boston-Houghton Mifflin Co, Latest Edition
- Engineering Material, Surendra Singh, Vikas Publishing House Delhi, Latest Edition
- Engineering Material, R.S Deshpande, Poona United Book corporation, Latest Edition

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#### **Approval:**

**Board of Studies:**

**Board of Faculty:**

**Academic Council:**

**Resolution No. 32.3**

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**Dated: 03-10-2020**

**Dated: 07-10-2020**

**Dated: 22-10-2020**



**Mehran University of Engineering and Technology, Jamshoro**  
**Department of Civil Engineering**

<b>Title of Subject</b>	:	<b><u>Engineering Mechanics (Th + Pr)</u></b>	
<b>Code</b>	:	<b>CE116</b>	
<b>Discipline</b>	:	Civil Engineering (1 <sup>st</sup> Semester)	
<b>Effective</b>	:	20-Batch and onwards	
<b>Pre-requisite</b>	:	Nil	<b>Co-requisite: Nil</b>
<b>Assessment</b>	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final)	
		Practical: 40% Sessional, 60% Final Semester Examination	
<b>Credit Hours</b>	:	03 + 01	<b>Marks : 100 + 50</b>
<b>Minimum Contact Hours:</b>		45 + 45	

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**Course Learning Outcomes (CLOs):**

Upon successful completion of the course, the student will be able to:

CLO No.	Description	Taxonomy Level	PLO
1	ANALYZE the two-dimensional Force System and Equilibrium conditions by applying the basic principles of statics.	C4	2
2	APPLY fundamental concepts of kinetics and kinematics to the analysis of a body when it is subjected to different types of motion.	C3	1
3	DEMONSTRATE external behavior of bodies subject to force system and equilibrium.	P4	4

**Contents:**

- **Introduction:** Concept of mass, force, time and space, Scalar and Vector quantities
- **System of Forces:** Force types, characteristics and system of forces, resolution and composition of force system by analytical and graphical method, Concept of moment of force, Principle of Transmissibility, Principle of Moment
- **Equilibrium of Rigid Bodies:** Equilibrium and its Conditions, free body diagram and its application. Equilibrium of Rigid Body, Determination of Support Reactions
- **Friction:** Concepts, laws of friction, Friction on horizontal and inclined plane, angle and co-efficient of friction.
- **Kinematics:** Newton's laws of motion, motion under constant acceleration, motion under variable acceleration, Projectile Motion, Simple harmonic motion
- **Kinetics:** Work, Power, Energy and laws of conservation of energy.

**Practical Work to be carried out:**

1. Introduction to the Engineering Mechanics Laboratory and HSE (Health, Safety and Environment) measures.
2. To verify Parallelogram law of forces by using Force Board.
3. To verify Triangle law of forces by using Force Board.
4. To verify Polygon law of forces by using Force Board.
5. To verify the polygon law of forces using Funicular polygon apparatus.
6. To verify the first condition of equilibrium using Force Board.
7. To verify the second condition of equilibrium using meter scale-beam method Board.
8. To find out the co-efficient of friction on horizontal steel plane for various materials.
9. To find out the angle of static, dynamic friction and the coefficient of friction between various materials on inclined steel plane for various materials.



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10. To find out the angle of static, dynamic friction and the coefficient of friction between various materials on precision friction force apparatus at different speeds.
11. To verify that the centrifugal force varies in direct proportion to mass of rotating body, square of speed of rotation and the radius of gyration.
12. To determine the experimental values of the force in the principal parts of the Jib Crane and to see the effect of altering the tie length.
13. To compare the results of wall Jib crane with the forces obtained from graphical solutions using polygon or triangle law of forces.
14. To measure the bending moment and shear force at a normal section of a loaded beam and to check its agreement with theory.
15. To perform an open-ended lab.

**Recommended Books:**

- Engineering Mechanics, R.C Hibbler, Prentice Hall IC, Latest Edition
- Engineering Mechanics, F.L Singer, Harper & Row Publisher, Latest Edition
- Engineering Mechanics, R.S Khurmi, Poona United Book Corporation, Latest Edition

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