

# Curriculum

2023 Batch



## B.Sc Civil Engineering

### University of Engineering and Technology Taxila

(Applicable for Session 2023)

\*Duly recommended in the 48th meeting of the Academic Council held on December 02, 2022 and approved in the 63/2022 meeting of the syndicate held on December 31, 2022.

## Scheme of Study for Semesters of B.Sc. Civil Engineering

1 <sup>st</sup> Year			
Sem.	Course Title	Code	CHs
<b>1<sup>st</sup> SEMESTER</b>	Engineering Drawing	CE-101	1+2
	Engineering Mechanics	NS-102	3+1
	Engineering Geology	ES-103	2+0
	Surveying-I	CE-104	2+1
	Calculus and Analytical Geometry	MA-105	3+0
	Islamic Studies	HU-112	2+0
	<b>Sem. Cr. Hr. =</b>		
<b>2<sup>nd</sup> SEMESTER</b>	Surveying-II	CE-106	2+2
	Engineering Materials	CE-107	2+1
	Professional Ethics	HU-108	2+0
	Differential Equations	MA-109	3+0
	Pakistan Studies	HU-110	2+0
	Professional English	HU-111	2+0
	<b>Sem. Cr. Hr. =</b>		
<b>1<sup>st</sup> Year Cr. Hr. =</b>			<b>33</b>

2 <sup>nd</sup> Year			
Sem.	Course Title	Code	CHs
<b>3<sup>rd</sup> SEMESTER</b>	Fluid Mechanics-I	CE-201	2+1
	Properties of Concrete	CE-202	2+1
	Engineering Practice	CE-203	2+0
	Numerical Analysis & Computer Programming	MA-204	3+1
	Hazards and Disaster Management	MS-212	3+0
	Introduction to GIS and RS	NS-214	2+0
	<b>Sem. Cr. Hr. =</b>		
<b>4<sup>th</sup> SEMESTER</b>	Theory of Structures-I	CE-206	3+0
	Strength of Materials-I	CE-207	3+1
	Soil Mechanics-I	CE-208	2+1
	Drawing, Estimation & Construction	CE-209	2+1
	Probability and Statistics	MA-213	3+0
	Communication Skills & Technical Report Writing	HU-211	2+0
	<b>Sem. Cr. Hr. =</b>		
<b>2<sup>nd</sup> Year Cr. Hr. =</b>			<b>35</b>

3 <sup>rd</sup> Year			
Sem.	Course Title	Code	CHs
5 <sup>th</sup> SEMESTER	Theory of Structures-II	CE-301	3+1
	Strength of Materials-II	CE-302	3+1
	Soil Mechanics-II	CE-303	3+1
	Construction, Planning & Management	MS-304	2+1
	Hydrology and Water Resources	CE-305	2+1
	<b>Total Cr. Hr. =</b>		
6 <sup>th</sup> SEMESTER	Reinforced Concrete-I	CE-307	3+0
	Design of Steel Structures	CE-308	3+0
	Fluid Mechanics-II	CE-309	2+1
	Transportation Engineering-I	CE-310	2+1
	Computer Applications	CE-311	2+1
	<b>Total Cr. Hr. =</b>		
<b>3<sup>rd</sup> Year Cr. Hr. =</b>			<b>33</b>

4 <sup>th</sup> Year			
Sem.	Course Title	Code	CHs
7 <sup>th</sup> SEMESTER	Environmental Engineering-I	CE-401	2+0
	Reinforced Concrete-II	CE-402	3+1
	Hydraulics Engineering	CE-403	2+1
	Transportation Engineering-II	CE-404	2+1
	Foundation Engineering	CE-405	2+1
	Project	CE-406(A)	0+3
	<b>Total Cr. Hr. =</b>		
8 <sup>th</sup> SEMESTER	Structural Engineering	CE-407	3+0
	Irrigation Engineering	CE-408	2+0
	Analysis and Design of Structures	CE-409	2+2
	Environmental Engineering-II	CE-410	2+1
	Entrepreneurship & Leadership	MS-411	2+0
	Project	CE-406(B)	0+3
	<b>Total Cr. Hr. =</b>		
<b>4<sup>th</sup> Year Cr. Hr. =</b>			<b>35</b>

## Lab Course Contents

### Engineering Materials (Lab)

#### Course Outlines:

1. Layout of Lab.
2. Determination of Water Absorption of Coarse Aggregates. (ASTM C 127 - 15)
3. Determination of Voids in aggregates and Bulk Density by Rodding, Jigging and Loose method. (ASTM C29/C29M - 09)
4. Determination of Specific Gravity of Coarse Aggregates used in Concrete. (ASTM C127 - 15)
5. To Perform Particle Size Distribution of Coarse Aggregates. (ASTM C136/C136M - 14)
6. Determination of the Aggregate Crushing Value of Coarse Aggregates (BS 812 - 110 )
7. Determination of Specific Gravity of Fine Aggregates used in Concrete. (ASTM C128 - 15)
8. To find the Fineness Modulus of Sand. (ASTM C136/C136M - 14)
9. To Determine the Normal Consistency of Hydraulic Cement. (ASTM C187-08)
10. To Determine the Initial and Final Setting Time of Hydraulic Cement. (ASTM C191-08)
11. To Determine the Compressive Strength of Hydraulic Cement Mortar Using 50 mm and 70mm Mortar Cubes. (ASTM C184 - 08) And (BS 4550 - 1978)
12. To Determine the Fineness of Hydraulic Cement Using Sieves. (ASTM C184 - 08)
13. To Determine the Specific Gravity of Hydraulic Cement. (ASTM C188-10)
14. To Find the Compressive Strength and Percentage of Water Absorption of Clay Bricks. (ASTM C67 - 14)

## **Properties of Concrete (Lab)**

### **Course Outlines:**

1. Layout of Lab.
2. To Determine the Compressive Strength of Cylindrical and Cubical Concrete Specimens (Casting + Testing). (ASTM C39/C39M-03) and (BS 4550-3.4:1978)
3. To Find the Split Tensile Strength of Cylindrical Concrete Specimens. (ASTM C496/C 496M-04)
4. To find the Flexural Strength of Concrete (Using Simple Beam with Third Point Loading). (ASTM C 78-02)
5. To Find the Flexural Strength of Concrete (Using Simple Beam With Centre-Point Loading). (ASTM C 293-02)
6. To Perform Schmidt Rebound Hammer Test on A Specified Member to Find the Compressive Strength of Concrete. (ASTM C805/805M - 13)
7. To Perform the Ultrasonic Pulse Velocity Test on A Specified Member to Find the Compressive Strength of Concrete. (ASTM C597 - 02)
8. To Perform Concrete Core Cutter Test on Specified Concrete Specimen to Find the Compressive Strength of Concrete. (ASTM C42/C42 - 13)
9. 10% fine value test on coarse aggregates. (BS 812 - 111)
10. Determination of Aggregate Impact Value of coarse aggregates. (BS 812 - 112 )
11. Workability of concrete by Slump Cone Apparatus. (ASTM C143/143M - 14 )
12. Workability of concrete by vebe Consistometer. (BS 1881 - 104)
13. Workability of concrete by Compacting Factor Apparatus. (BS 1881 - 103)

## **Theory of Structures-II (Lab)**

### **Course Outlines:**

1. Layout of the Lab.
2. To Determine forces in members of a statically determinate Truss, and comparison of experimental and theoretical Values.
3. To determine deflection of determinate beams subjected to variety of loadings.
4. To determine deflection of determinate frames subjected to variety of loadings.
5. To verify values of influence line for different response components of determinate beams like reaction forces, shear forces and bending moments.
6. Experimental verification of method of consistent deformation for one-degree indeterminate beams subjected to variety of loadings.
7. Experimental verification of method of consistent deformation for two-degree indeterminate beams subjected to variety of loadings.
8. Experimental verification of deflection of frames without side-sway.
9. To determine sidesway deflection of statically indeterminate square frame under uniform loading and horizontal load.
10. To determine sidesway deflection of statically indeterminate unsymmetrical portal frame under point load & uniform loading.
11. To verify values of influence line for different response components of one-degree indeterminate beams like reaction forces, shear forces and bending moments.
12. To find out horizontal thrust in a 3-hinged Arch (Determinate).
13. To find out horizontal thrust of a semicircular arch.

## **Reinforced Concrete-II (Lab)**

### **Course Outlines:**

1. Layout of Lab
2. To Perform Concrete Permeability Test on A Specified Member (Cube / Cylinder).
3. To Study the Behavior of Over Reinforced Concrete Beam
4. To Study the Behavior of Under Reinforced Concrete Beam.
5. To Study the Buckling and Stress Strain Behavior of Reinforced Concrete long Column by Compression Testing Machine
6. To Study the Effects of Ties in Concrete Columns
7. To Study the behavior of spirally in Concrete Columns
8. To Study the Effects of Stirrups in Concrete Beams.
9. To Study the Behavior of One-Way Slab.
10. To Study the Behavior of Two-way Slabs.

## **Environmental Engineering-II (Lab)**

### **Course Outlines:**

1. Determination of pH of water sample.
2. Determination of total hardness of water sample.
3. Determination of calcium and magnesium hardness of water sample.
4. Determination of chlorides of water sample.
5. Determination of salinity and turbidity of water sample.
6. Determination of total and faecal coliform of water sample by membrane filtration technique method and MPN method.
7. Determination of alkalinity, acidity and conductivity of water sample
8. Determination of total solids of wastewater sample.
9. Determination of total dissolved solids of wastewater sample.
10. Determination of total suspended solids of wastewater sample.
11. Determination of settleable solids of wastewater sample.
12. Determination of dissolved oxygen in wastewater sample by acid modification of wrinkles method.
13. Determination of biochemical oxygen demand of wastewater sample.
14. Determination of chemical oxygen demand of wastewater sample.
15. Determination of oil and grease content in wastewater sample.
16. Determination of nitrogen, sulphates and iron in wastewater sample.



## **Surveying-II (Lab)**

### **Course Outlines:**

1. Base line and missing line measurement
2. Measurement of horizontal angles of traverse
3. To find bearings between survey stations
4. To find distance between survey stations by tachometry
5. Computation and plotting of traverse station coordinates
6. To plot circular curve using tangential method
7. To find height of inaccessible point using total station
8. To find height of inaccessible point using conventional methods
9. To check verticality of a column
10. To visualize and map geographic data using google earth and digital globe
11. To locate, navigate and track survey stations using GPS