

Course Book

<p>Course Description</p>	<p>The emphasis of FreeHand is placed on drawing set-up; creating and modifying geometry; storing and retrieving predefined shapes; placing, rotating, and scaling objects; adding text and dimensions; using layers and coordinating systems in terms of Civil engineering and Architectural drawings.</p>
<p>Course objectives</p>	<ol style="list-style-type: none"> 1. From a selection of sketches, diagrams, drawings, models and oral presentations students will demonstrate <ul style="list-style-type: none"> ○ an understanding of the interplay of form, structure and function in 3D space; ○ an ability to analyze structures by dividing it into its organizational, structural, functional and experiential components; ○ an understanding of sites and contexts of structures in scales ranging from that of human body to the city. 2. From a selection of short essays, papers and oral presentations students will demonstrate <ul style="list-style-type: none"> ○ an understanding of select works of structures; ○ an ability to interpret the works by placing them in their historical, social and artistic contexts; ○ an understanding of the symbolic meanings and social consequences of architectural and urban intervention in history and the present.
<p>Student's obligation</p>	<p>Attending the lecture is a fundamental part of the course. You are responsible for material presented in the lecture whether or not it is discussed in the textbook. You should expect questions on the exams to test your understanding of concepts discussed in the lecture and in the homework assignments.</p> <p>It can be very helpful to study with a group. This type of cooperative learning is encouraged; however, be sure that you have a thorough understanding of the concepts besides the mathematical steps used to solve a problem. You must be able to work through the problems on your own.</p>
<p>Required Learning Materials</p>	<p>Engineering Drawing</p>
<p>Assessment scheme</p>	<p>16% Mid Term 4% Quiz 40% Assignment sheets (Class+Home) 40% final</p>

<p>Specific learning outcome:</p>	<ol style="list-style-type: none"> 1) Interpreting structural-civil engineering plans. 2) Understanding of Building Information Modelling (BIM). 3) Ability to use Auto-CAD and drawing instruments. 4) Ability to draw structural and civil engineering plans by using freehand and AutoCAD. 5) Understanding of general Auto-CAD terminology, coordinate systems, inquiry commands, draw commands, edit commands, dimensioning, block commands, layers, display commands, utility commands, and setting prototype drawings. 6) Ability to create designs, drawings, and assemblies of abstract geometrical forms involving real or conceptual objects, and will be able to utilize creativity and visualization skills to solve engineering design problems. 	
<p>Course References:</p>	<ol style="list-style-type: none"> 1. All documents which are related to hand drawing in the lecture notes. 2. An Introduction to Drawing for Civil Engineers; A. Elsheikh; McGraw-Hill; 1995. 	
<p>Course topics (Theory)</p>	<p>Week</p>	<p>Learning Outcome</p>
<p>Types of lines and Leveling of Building</p>	<p>Week 1</p>	<p>How to know the dash and solid lines</p>
<p>Introduction of some abbreviations in Structural Engineering</p>	<p>Week 2</p>	<p>Some symbols of concrete, wood, steel, glass, etc</p>
<p>Drawing of some structural sections in houses plan</p>	<p>Week 3</p>	<p>How to know the structural members and drawing</p>
<p>Studying of some introduction in buildings: Foundation Drawing</p>	<p>Week 4</p>	<p>How to draw the separated, combined and Mat foundation</p>
<p>Reinforced of footings</p>	<p>Week 5</p>	<p>How to draw the dowels and reinforcement</p>

Types of Steel Structures	Week 6	Warehouse example, tension and compression members
Longitudinal and transverse sections	Week 7	How to draw the sections for both views
Drawing of Beams	Week 8	Drawing a typical beam with all details
Drawing of Columns	Week 9	Drawing a typical column with all details
Drawing of Slabs	Week 10	Drawing a typical slab with all details
Reinforced details of stairs	Week 11	Drawing a typical stair with all details
Structural Drawing of a typical Manhole	Week 12	Drawing a typical Manhole with all details
Structural Drawing of house building with all details	Week 13	Drawing all sections in house building
Structural Drawing of reinforced concrete structure with all details	Week 14	drawing all details of RC building
Practical Topics	Week	Learning Outcome
Types of lines and Leveling of Building	Week 1	How to know the dash and solid lines
Introduction of some abbreviations in Structural Engineering	Week 2	Some symbols of concrete, wood, steel, glass, etc
Drawing of some structural sections in houses plan	Week 3	How to know the structural members and drawing
Studying of some introduction in buildings: Foundation Drawing	Week 4	How to draw the separated, combined and Mat foundation
Reinforced of footings	Week 5	How to draw the dowels and reinforcement
Types of Steel Structures	Week 6	Warehouse example, tension and compression members
Longitudinal and transverse sections	Week 7	How to draw the sections for both views
Drawing of Beams	Week 8	Drawing a typical beam with all details
Drawing of Columns	Week 9	Drawing a typical column with all details

Drawing of Slabs	Week 10	Drawing a typical slab with all details
Reinforced details of stairs	Week 11	Drawing a typical stair with all details
Structural Drawing of a typical Manhole	Week 12	Drawing a typical Manhole with all details
Structural Drawing of house building with all details	Week 13	Drawing all sections in house building
Structural Drawing of reinforced concrete structure with all details	Week 14	drawing all details of RC building

Questions Example Design

Q1) Draw the typical detail of residential home foundation with all details of reinforcement.

Q2) Draw all reinforced details for the one meter cantilever beam with width 40cm and height 60 cm section supported on column 40 cm x 40 cm

Extra notes:

External Evaluator



Dr. Bahman Omar Taha
 Assist Prof.
 Ph.D. in Structural Engineering.