



## (Module Name) Course Catalogue

2022-2023

College	Erbil Polytechnic University	
Department	Road construction	
Module Name	Engineering Drawing (CAD)	
Module Code	END106	
Semester	1	
Credit	8	
Module type	Assistant	
Weekly hours	6	
Weekly hours (Theory)	( )hr Class	( )hr Workload
Weekly hours (Practical)	( 6 )hr Class	( 212 )hr Workload
Lecturer (Theory)		
E-Mail		
Lecturer (Practical)	Saud Ahmed Hussein	
Email	saud.hussein@epu.edu.iq	

## Course Book

### - Course overview:

This course is one of the main courses for year one students in road construction departments and aims to introduce the language of drawing that used among all engineers entire the world.

Drawing is the universal language of engineering. Drawings from an engineer provide a raw account of the fundamentals that will eventually go into making something useful and necessary, something which may save time, effort, record, or make a thing work. Engineering drawing is a formal and precise way of communicating information about the shape, size, features and precision of physical objects. The drawings of the engineer are an obvious case of making visible the practical expression of the profession, the interpretation of which has a direct impact on the final product.

### - Course objective:

The aim of this course is to aid students in :-

- Recognizing the different types of engineering drawings
- Understanding and creating any types of engineering drawings
- Identifying drawing instruments, standard sheet sizes, standard engineering drawing formats and scales.
- Classifying the common terms, symbols, legends, notes and abbreviations used on engineering drawings.
- Understanding the multi view projections illustrated from viewing engineering objects.

- Drawing any three views using proper conventions, placement, and alignment.
- Understanding the meaning of sections and cutting plane lines.
- Drawing a sectional view, given a two-view drawing.

Getting information about CAD and how it helps in engineering drawing

**Student's obligation**

- Students are obliged to bring all the instruments and tools that are required for drawing, such as ( drawing sheets, T-square, set square, drafting compass,....). They also must attend every lecture as the course assessed on daily works mostly. Students also have the responsibility of drawing all the homework sheets.

**- Forms of teaching**

Drawing-lecture halls for ( learning , exercising and lecture presentations, white board, overhead projector, posters with data show equipment for lecture presentations

**- Assessment scheme**

Sheets (Class + Home) 40%

Quiz 4%

Mid Term 16%

Final 40%

**- Specific learning outcome:**

At the end of year, student will be able to:

- Read and understand any engineering drawing.
- Identify the types of lines and their use used in engineering drawing
- Recognize the geometrical shapes such as; triangles, pentagon, hexagons, so on and to draw them geometrically.
- Drawing projection views and sections for three dimensional shapes.
- Ready to use AUTO CAD programme in the next year.
- Ready for drawing engineering maps such as roads and buildings

- **Course Reading List and References:**

Engineering Graphics / Frederick E. Giesecke

The Fundamentals of Engineering Drawing and Graphic Technology / Thomas E. French

Engineering Drawing from the Beginning / M.F. Cousins

Papers and magazines from Internet

الرسم الهندسي / عبدالرسول الخفاف

أساسيات الرسم الهندسي/ سُفيان توفيق أحمد سعيد و عاهد علي الخطيب

- <b>Course topics (Practical)</b>	<b>Week</b>	<b>Learning Outcome</b>
<b>Introduction to Graphic Communication</b> : Drawing , Artistic Drawings , Technical Drawings , Imagination or visualization and creativity of forming images or visioning concepts of objects not present to the senses .	1	
<b>Basic information and an introduction to engineering drawing and its importance</b> : Engineering and technical drawing instruments / ( manually instruments ) and their uses , Drawing vocabulary ( drawing lines , lettering and freehand lines , Free-hand sketching or conceptual drawing , Measurement systems , Scales and drawing scales , Dimensioning , Standard drawing and sketching media , Sheet layouts ( sheet sizes , margin and title blocks , borders and frames ) .	2	
<b>Geometrical construction , ( plane and solid geometry )</b> : Techniques of geometric constructions , Engineering and geometrical drawings , Loci ( singular locus loci ) or ( exact positions ) of points , Applied geometry and geometrical construction , Drawing parallel and perpendicular lines , Bisection of a line , Divide a line into multiple equal parts , Bisection of an angle	3	

<p>, Finding the center of an arc .</p> <p><b>Tangency drawing</b> , Inscribe a circle in a triangle , Circumscribe a circle on a triangle . Drawing of plane figures such as regular polygons i.e. ( Pentagon , Hexagon , Heptagon and ..... others ) , Ellipse construction and isometric circles , drawing an arc tangent to an angle or two intersected lines , Drawing arcs/circles tangent or parallel to lines and/or circles , Construct an arc tangent to two radii or diameters , Drawing an ogee curve , and many other different geometrical drawings .</p>		
<p><b>Curves used in engineering practice , conic sections</b> : common engineering curves ( conic ( parabolic , elliptical , hyperbola ) curves and spiral curves .</p> <p><b>Preface to nomography and orthography reading for conversing views</b> . Applications of geometric constructions by drawing some patterns ( geometrical figures ) and engineering shapes using more than one method and by different drawing scales .</p>	4	
<p><b>Sketching and freehand drawing</b> : Exercising for sketching , Working sketch different shapes and views free handy .</p> <p><b>Lettering and lines in engineering drawings</b> : Letter styles , Technique of lettering , Guide lines , Spacing of letters and spacing of words and lines .</p> <p><b>Dimensioning ( introduction and definitions )</b> : Steps in dimensioning , Where to put dimensions , Types of dimensioning , Arrow heads and leader line , Dimension and extension lines , Text height , Lettering and identification of drawings and shapes .</p>	5	
<p><b>Theory and types of projections</b> : Graphics theory – geometry and projection techniques , Parallel – orthographic or ( multi view projection ) , Multi-view projection in four quadrants ( Front , Top and Side ) , Views in third and first angle projection ,</p>	6	

Axonometric projection for creating pictorial drawing of objects where the object is rotated around one or more of its axes to reveal multiple sides .		
<b>Isometric projection ( isometric-pictorial drawing ) :</b> Isometric and non-isometric lines , Oblique projection ( oblique-pictorial drawing ) , Converting views and orthographic reading , Convert pictorial (3-D) drawings to orthographic (2-D) drawings and vice versa , Conversion of isometric views to orthographic views and vice versa .	7	
<b>Identification of surfaces from pictorial view to orthographic views ,</b> Methods of constructing isometric drawing ( Box method , Off-set method ) , Showing an incomplete orthographic projection of an object to draw the missing lines and complete the orthographic projection .	8	
<b>Third or missing projection :</b> Drawing or constructing of the third or missing projection view from the other two orthographic views . Auxiliary projections , types of auxiliary views , Introduction to perspective theory , oblique and perspective projections .	9	
<b>Section of solids :</b> Principle and application of sectioning , Cutting plane , Sections views and development of surfaces , How sections are shown ? , Intersection of surfaces , Drawing of sectional projections and views , Drawing isometric-pictorial shapes consists cutting projection or surfaces .	10	
<b>Civil drawing :</b> Building drawing planning and design , Graphical explaining of most important terms used in building drawing and the basic civil engineering symbols .	11	
<b>COMPUTER-AIDED DRAFTING (CAdR) , AutoCAD</b>	12	

<b>applications :</b>  Function keys , Drawing entities ( draw commands ) , Editing of a drawing ( modify commands ) , Symbol library ( block , wblock and insert ) , Two dimensional drawing , Isometric drawing , 3D geometrical modeling , 3D wireframe modeling , 3D surface modeling , 3D solid modeling , Commands to generate profile based 3D solids , Three dimensional drawing , Perspective view in AutoCAD .		
-		<b>Learning Outcome</b>
		<b>Learning Outcome</b>
<p style="text-align: center;">- Examinations (question design):</p> <p style="text-align: center;"><b>Sample of questions</b></p>		

Ministry of Higher Education & Scientific Research  
Erbil Polytechnic University  
Erbil Technology Institute  
Road Construction Department

Stage: First Year  
Time: 3hr  
Subject: Eng. Drawing  
Date: 9/6/2015

**Final Exam (First attempt) / 2014-2015**

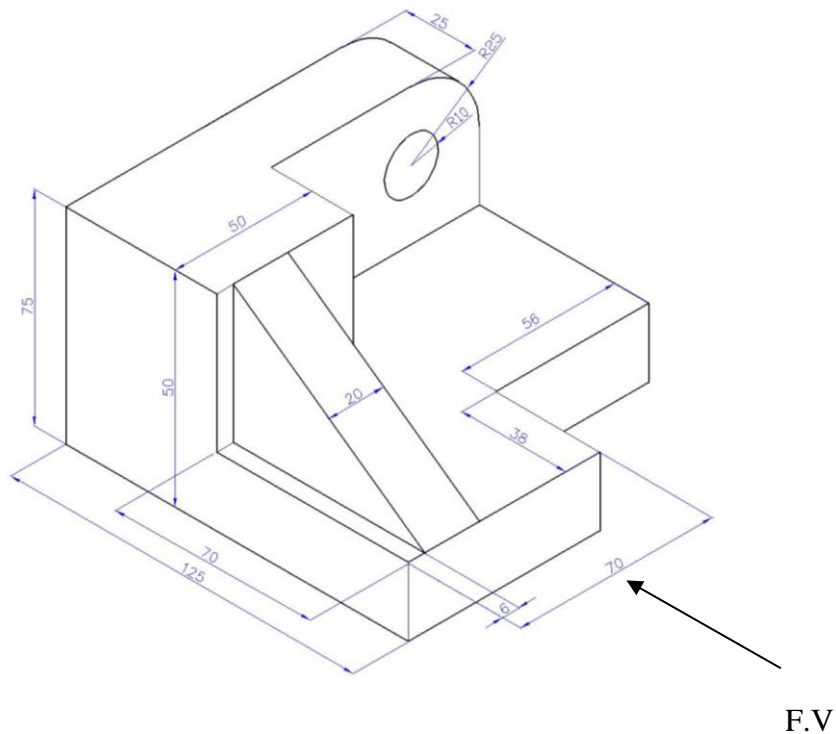
**Remarks:**

- 1- Border and information box are **NOT** required.
- 2- All assisting lines are required, **DO NOT** erase them.
- 3- All given dimensions are in **mm**.
- 4- Put all the dimensions.

**Q1.** For figure(1), use the orthographic projections to draw the following

(35 Marks)

- Front view
- Side view
- Top view





Figure(1)

**Q2.**

Draw the Isometric pictorial on 30-degree axis for figure (1), using scale (1:2)

(30Marks)

**Q3.** For figure(2), use scale 1:1 to draw the following

( 35Marks)

- Sectional Front view
- Side view
- Top view

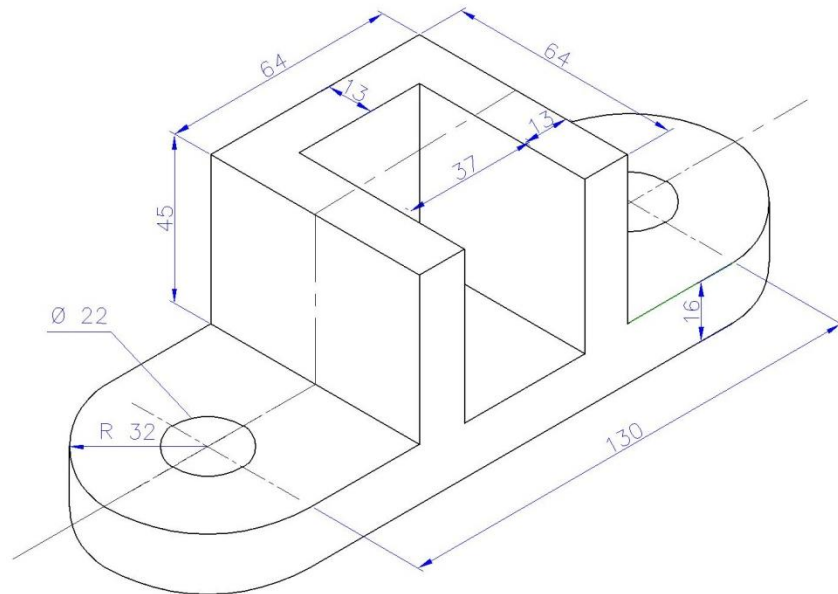
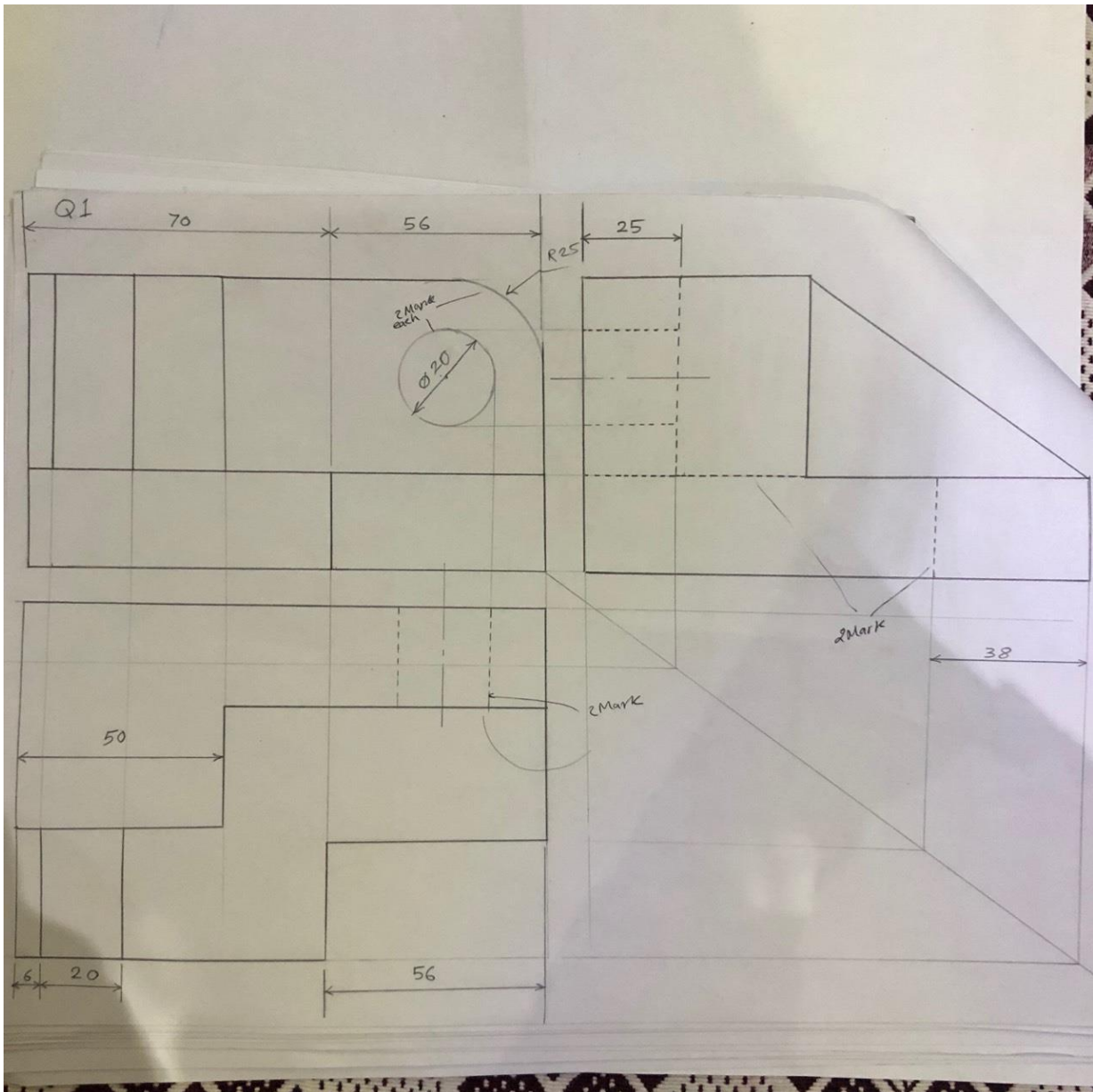


Figure (2)

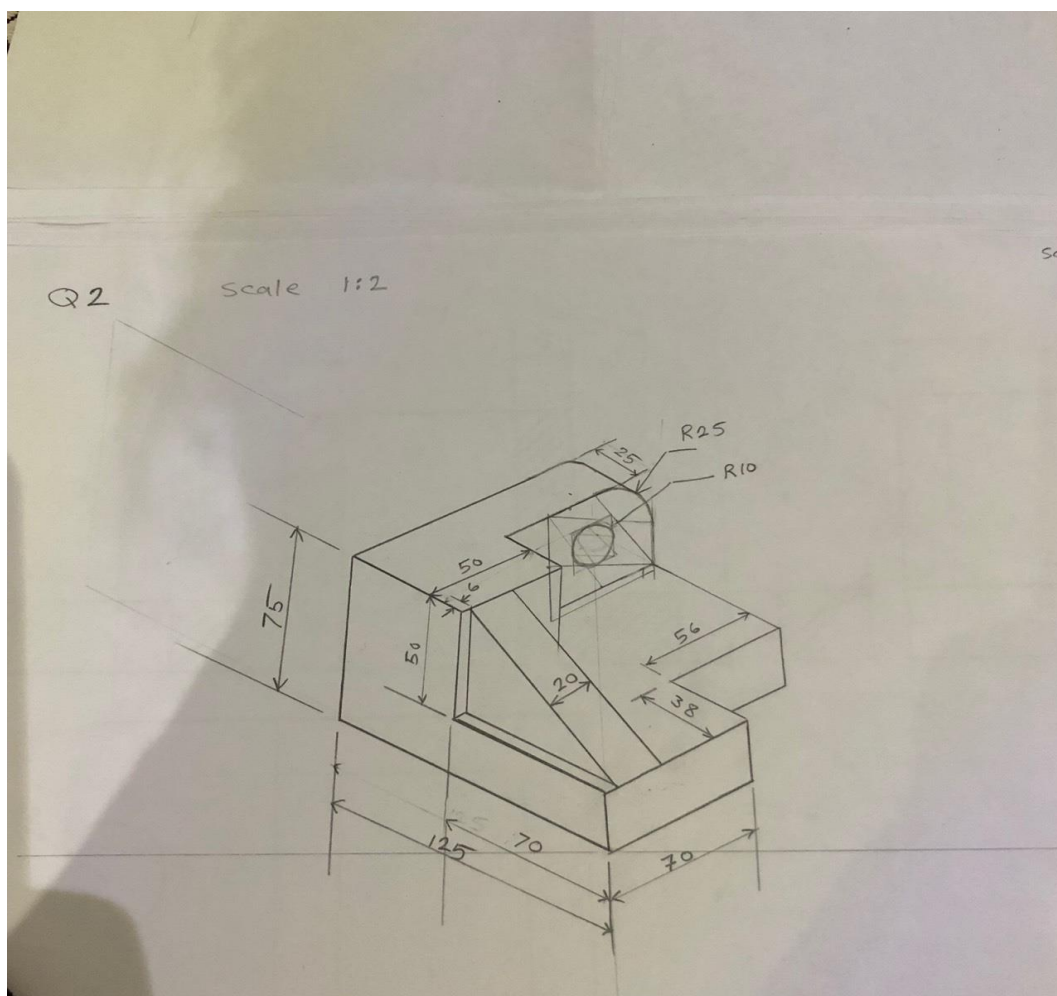
F.V

Lecturer

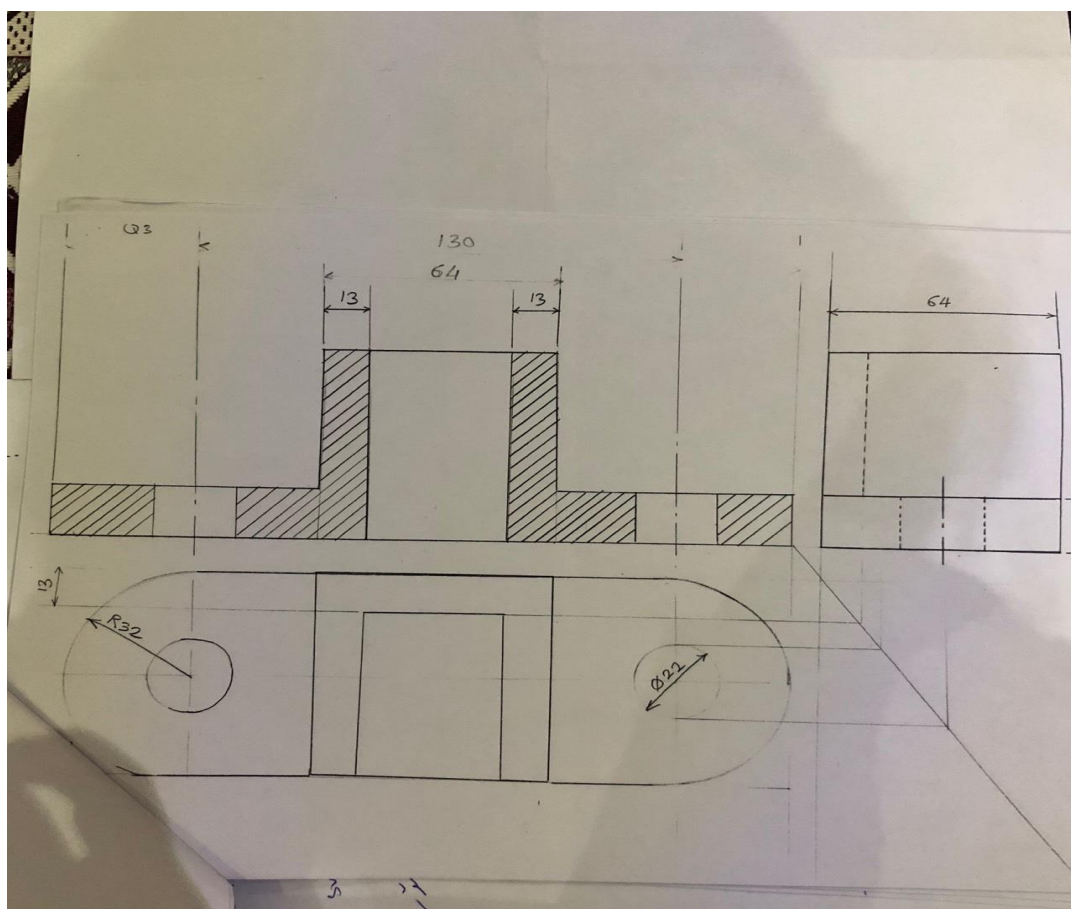
### Answers of the questions



Q2/



Q3/



I have no notification

Date: 7/12/2022

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