



## Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	Erbil Technology College	
Department	Surveying and Road Construction Department	
Module Name	ROAD DRAWING AutoCAD	
Module Code	ROD 305	
Degree	Technical Diploma <input checked="" type="checkbox"/>	Bachelor <input type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> Ph.D. <input type="checkbox"/>
Semester	Semester 3	
Qualification	Ph.D. in Civil/Environmental Engineering	
Scientific Title	Assistant Professor	
ECTS (Credits)	6	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours	3 hrs.	
Weekly hours (Theory)	( )hr Class	( )Total hrs Workload
Weekly hours (Practical)	( 3 )hr Class	(162) Total hrs Workload
Number of Weeks	16	
Lecturer (Theory)	/	
E-Mail & Mobile NO.	/	
Lecturer (Practical)	Dr.Abdulfattah Ahmad Amin Al-Najjar	
E-Mail & Mobile NO.	abdufattah.amin@epu.edu.iq	
Websites	/	

# Course Book

<b>Course Description</b>	<ul style="list-style-type: none"><li>▪ This course is one of the main courses for 2nd stage students in road construction departments and aims to introduce the road drawing for the students.</li><li>▪ The students are going to be able to understand and apply the concept of road drawing and constructions related the roads details and draw it on the sheet papers manually. They will be capable to use common tools and instruments using in the drawing halls to perform the drawing sheets correctly.</li><li>▪ Students should understand the principle and most useful characteristics of road drawing subject and learn the technical expressions, the road layers, surveying from photos taken by plane over the ground. These principles may help student to develop if they want to understand theories of road drawing in the future. The later have some basic and principle except that is based on computational software.</li><li>▪ Principles and theories of the course is interpreting drawing and engineering figures of road or bridges. It is fundamentally relating to scale between the data on the figures and sheets.</li><li>▪ Road drawing is technical surveying massive lands particularly associating with necessity of involving in computational based computer. A sound knowledge of the major areas of the subject.</li><li>▪ Students can develop this area when they graduated in department of road construction. Companies and organizations will ask for basics of the road drawings and they will understand these basics and apply practically.</li></ul>
<b>Course objectives</b>	<p>Standard drawings are to transport and main roads in the building of the roads and bridges. It is a collection of the department's most commonly used construction drawings. The purpose of these drawings is to provide typical standard details. The fitness for purpose of these drawings for a specific project shall be assist determined and certified by a registered professional engineer of Queensland (RPEQ engineer. A site plan is an architectural plan, landscape architecture document, and a detailed engineering drawing of proposed improvements to a given lot. A site plan usually shows a building footprint, travel ways, parking, drainage facilities, sanitary sewer lines, water lines, trails, lighting, and landscaping and garden elements. Such a plan of a site is a "graphic representation of the arrangement of buildings, parking, drives, landscaping and any other structure that is part of a development project". A site plan is a "set of construction drawings that a builder or contractor uses to make improvements to a property. Counties can use the site plan to verify that development codes are being met and as a historical resource. Site plans are often prepared by a design consultant who must be either a licensed engineer, architect, landscape architect or land surveyor".</p>

<p><b>Student's obligation</b></p>	<ul style="list-style-type: none"> <li>• Student must take practical and theoretical exams according to institute exam policies. During this, students have to take daily exam (quizzes) and homework. These exams and quizzes are account for students' overall marks.</li> <li>• If any Exam, assignment or quizzes has missed without formal permission such as medical leave or instructor's prior excuse, the student will receive a score of zero. No extra exams will be given. But if an exam or an assignment was missed due to an excused absence, then the lecturer may make it up again.</li> <li>• Students are obliged to answer and return any homework sheet given to them.</li> <li>• Students must respect the class so attending on time is highly recommended.</li> </ul>				
<p><b>Required Learning Materials</b></p>					
<p><b>Evaluation</b></p>	<p><b>Task</b></p>	<p><b>Weight (Marks)</b></p>	<p><b>Due Week</b></p>	<p><b>Relevant Learning Outcome</b></p>	
	<p>Paper Review</p>		<p>/</p>		<p>/</p>
	<p>Assignments</p>	<p>Homework</p>	<p>/</p>		<p>/</p>
		<p>Class Activity</p>	<p>40</p>		<p>To analyze and solve drawing problems</p>
		<p>Report</p>	<p>/</p>		<p>/</p>
		<p>Seminar</p>	<p>/</p>		<p>/</p>
		<p>Essay</p>	<p>/</p>		<p>/</p>
		<p>Project</p>	<p>/</p>		<p>/</p>
	<p>Quiz</p>		<p>4</p>	<p>1-12</p>	<p>To evaluate the student levels</p>
	<p>Lab.</p>		<p>/</p>		<p>/</p>
	<p>Midterm Exam</p>		<p>16</p>	<p>1-12</p>	<p>To let the student knowing his level</p>
	<p>Final Exam</p>		<p>40</p>	<p>1-12</p>	<p>To know who will pass the exam successfully</p>
	<p>Total</p>		<p>100</p>		<p>Final student mark</p>
<p><b>Specific learning outcome:</b></p>	<p>1- At the end of course the student can understand overall aspects of this subject they will improve it in future even the subject is rarely being used for road drawing techniques but the necessities of this kind of job is becoming very demandable by some company and government sectors. Then student can improve and enhance his/her carrier based on the terminologies comprehended in the highway drawing.</p> <p>2- Identify the difference between engineering drawing and road drawing.</p>				

	<p>3- Identify road drawings terminology in English language.</p> <p>4- Solve road drawings problems independently.</p> <p>5- Collaborate with their colleagues through working in groups in and outside the class.</p> <p>6- To be ready to drawing with AutoCAD software.</p>
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<b>Course References:</b>	<ul style="list-style-type: none"> <li>• Traffic Engineering (theory and practice) by Louis J. Pignataro with contributions by Edmund J. Cantilli [and others]/1973, English, Book, Illustrated edition.</li> <li>▪ Transportation Infrastructure Engineering A multi-model integration by Laster A. Hoel, Nicholas J. Garber and Adel W. Sadek. International Student Edition /2008.</li> <li>▪ TRAFFIC ENGINEERING HANDBOOK 5<sup>th</sup> Edition James L. Pline /Editor/ Institute of Transportation Engineers / 1999.</li> <li>▪ Road Design with AutoCAD Civil 3D.</li> <li>▪ HIGHWAY ENGINEERING by Martin Rogers Department of Civil and Structural Engineering Dublin Institute of Technology Ireland, 1988.</li> <li>▪ Handbook of Traffic Engineering Practices for Small Cities, Kansas Department of Transportation Kansas State University Second Edition 2005.</li> <li>▪ The Handbook of Highway Engineering Edited by T. F. Fwa © 2006 by Taylor &amp; Francis Group, LLC.</li> <li>▪ The manual of Highway Drawing by the technical foundation in Baghdad – Iraq 1992.</li> <li>▪ “Surveying with Construction Applications”, 8th edition, by Barry F. Kavanagh, Dianne K. Slattery, Pearson Education Limited-2015, UK.</li> <li>▪ “Elementary Surveying an Introduction to Geomatics”, 12th edition, Charles D. Ghilani and Paul R. Wolf, Pearson Education Limited-2008, UK.</li> <li>▪ “Civil Engineering Drawing”, M.Ezzal-Din &amp; M.Abdel-Rohman, Kuwait University publications-1985, Kuwait.</li> </ul>
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Course topics (Theory)	Week	Learning Outcome

<b>Practical Topics</b>	<b>Week</b>	<b>Learning Outcome</b>
Introduction, Definition of road drawing, History of road drawing, Types of roads in Iraq / Kurdistan, lettering and the technical expression used in road drawing.	1	To know about highway and roads
Draw road cross section of rigid /flexible pavement (AutoCAD).	2	To learn drawing types of cross-sections.
Draw typical highway (1km) with all necessary details (AutoCAD).	3	to draw in details
Drawing of Road (highway) profile (longitudinal Section) (AutoCAD).	4	To learn drawing types of profile.
Horizontal curves alignment with different methods and necessary formulas (AutoCAD).	5	To learn drawing types of H.C.
Vertical curves alignment with different methods and necessary formulas (AutoCAD).	6	To learn drawing types of V.C.
Horizontal alignments and spiral curves (AutoCAD).	7	To learn drawing types S.C.
Superelevation drawing for highways with three cases (AutoCAD).	8	To learn drawing types S.E.
Types of Retaining walls drawing (AutoCAD).	9	To learn drawing types R.W.
Drawing of car parking type's details (AutoCAD).	10	To learn drawing types S.P.
Mass haul diagram details (AutoCAD).	11	To learn drawing types of M.H.D.
Computer applications with AutoCAD Civil 3D.	12	To be able drawing with AutoCAD.

**Examinations (question design):**



**Ministry of Higher Education and  
Scientific Research**

**Erbil Polytechnic University**

**Erbil Technology College**

**Dept. of Surveying and Road Construction**

**Mid-Term Exam**

**2019– 2020**

**Stge: 2<sup>nd</sup>**

**Subject: Road Drawing**

**Time: 120 min.**

**Date:**

**Code:ROD 305**

Q 1) Draw the center line of road at horizontal curve has the data:  $R=210m$ ,  $\Delta=90^\circ$ , the chord length (X) =30m? Then find the (E, T, LC and y for  $X_1\dots\tau$ ) the scale is 1:2000? All mathematical and tables are required. For more explanation: the angles of PC, PT =  $\Delta / 2 = 45^\circ$  ?  
(30 M)

Q 2) Draw in suitable scale the sketch for a portion of parking area consisting three cars parked at angle (30°) degree, Mention for all necessary dimensions on the drawing?  
(26 M)

Q 3).A) Write in English the detail of the following symbols:

BVC, PI, GL, PT, L, MC. ? (12 M)

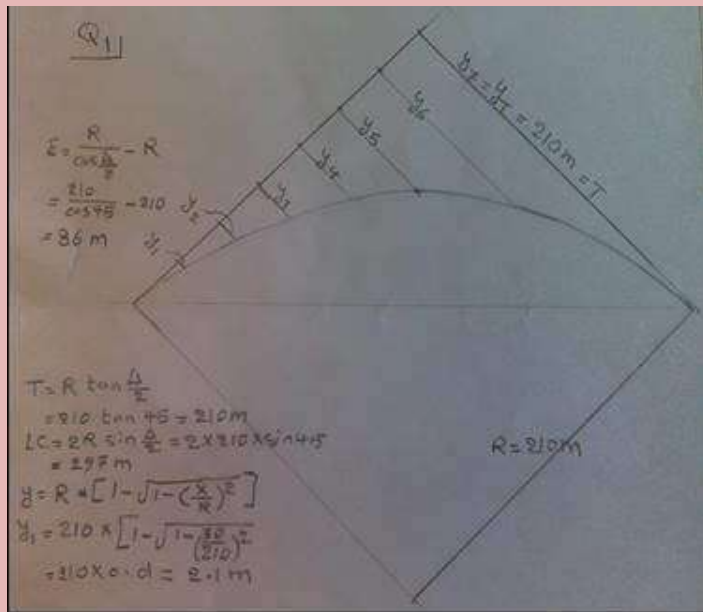
B) Draw the shapes of vertical curves (not to scale) for the grades when :

1-  $g_1$  is +ve , $g_2$  is +ve. Crest Condition 2-  $g_1$  is -ve , $g_2$  is -ve Crest Condition

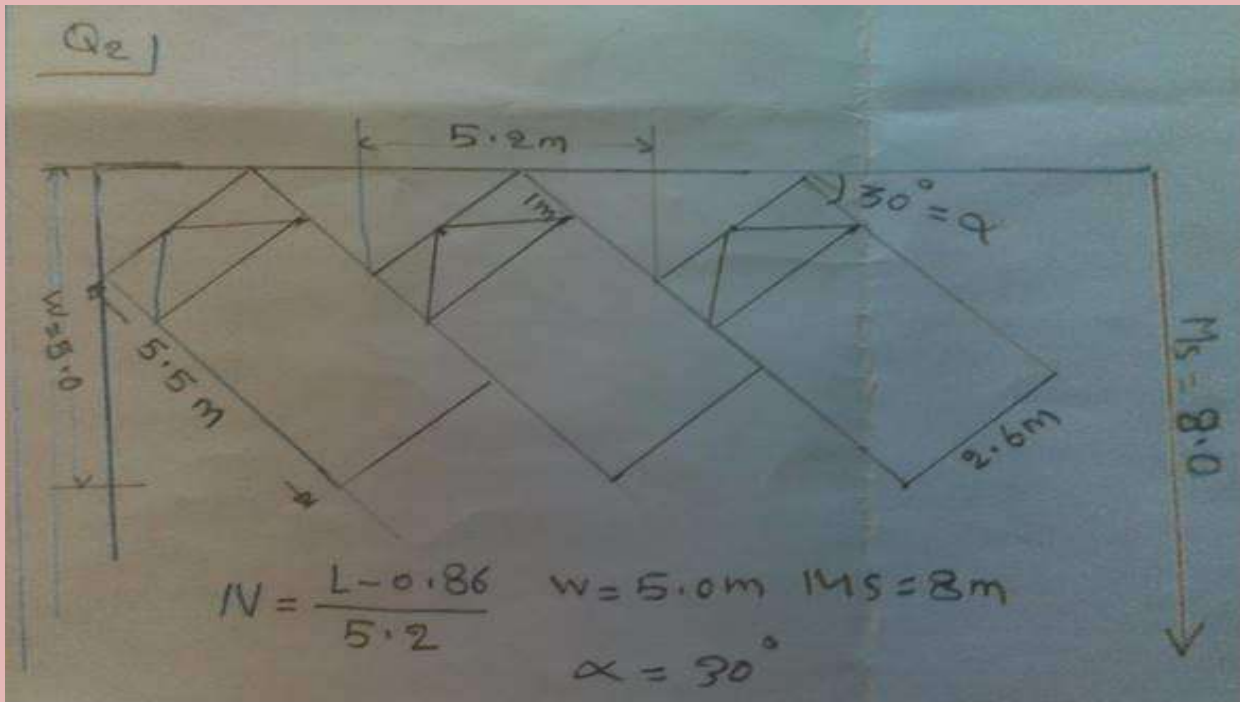
3-  $g_1$  is +ve , $g_2$  is -ve 4-  $g_1$  is -ve , $g_2$  is -ve Sag Condition ? (12 M)

Q 4) Draw the mass haul diagram for the following data in the table? Then are we have excess or shortage in soil quantity? How many in ( $m^3$ )? The horizontal scale is 1:2500 and the vertical scale is 1:1000?  
(20 M)

ANSWERS:-



Sta. P.	$\Delta X$	$ZX$	$\theta$
PC	0	0	0
1	30	30	2.1
2	30	60	8.4
3	30	90	19.7
4	30	120	37.8
5	30	150	63.0
6	30	180	103
PT=7	30	210	210





Q3/A

BVC : Beginning of vertical curve

PI : point of intersection

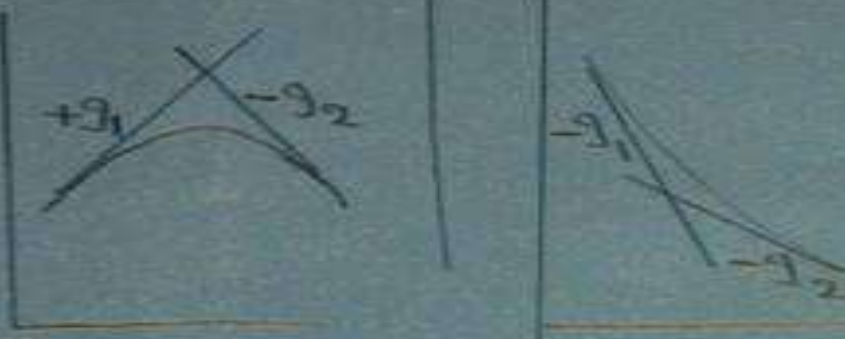
GL : Ground Level

PT : Point of tangency

L : Length of horizontal curve

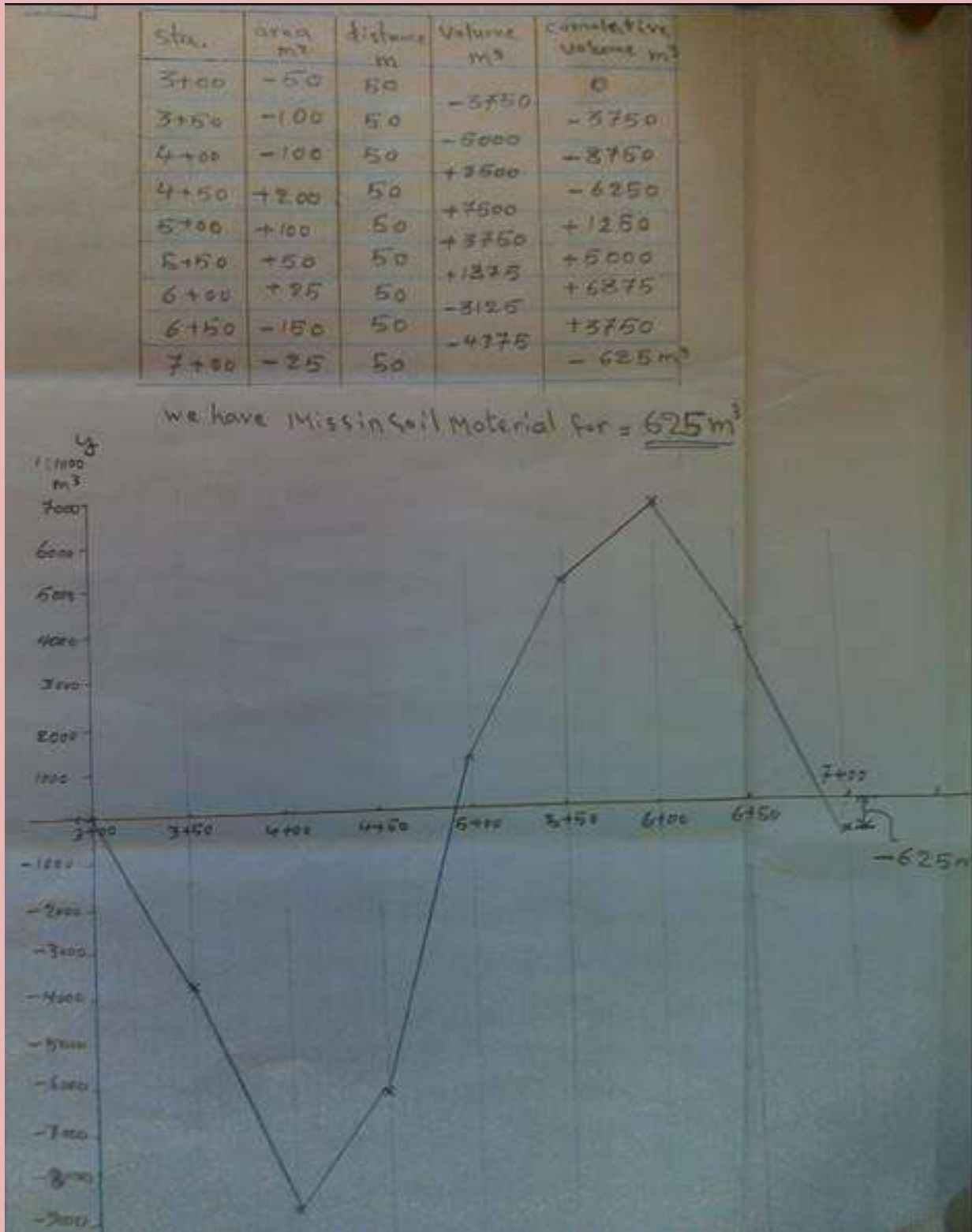
MC : Middle of curve

Q3/B





- Q4/



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- **Extra notes:**
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**I have no notifications.**

### **This Course catalogue has been prepared by:**

1- Assist. Prof. Dr. Abdulafattah Ahmed Amin.

### **External Evaluator**

This course book is reviewed by (Assistant Professor Dr. Ganjeena Jalal) as he is lecturer in department of Road Construction in Erbil technology College. He assessed and approved all content of the Road (highway) drawing subject as he admitted the course book is almost covered the several terms of Road (highway) drawing in both theoretical and practical aspects. The course can be presented in the classes for entire curriculum year.

Dr.Ganjeena Jalal  
Assist. Prof.

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