Engineering Surveying Course Catalogue

2023-2024

College/ Institute	Erbil Technology Institute	
Department	Surveying	
Module Name	Engineering Surveying	
Module Code	ENS203	
Semester	Second	
Credits	4	
Module type	Prerequisite [ ] Core [/] Assist. [ ]	
Weekly hours	2	
Weekly hours (Theory)	(2)hr Class	( )hr Workload
Weekly hours (Practical)	( )hr Class	( )hr Workload
Lecturer (Theory)	Muhsin Khalid Khdir	
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Lecturer (Practical)		
E-Mail & Mobile NO.		

Course Book

Course Description	The lectures are divided into Two weekly hours. The subject is taught based on Two hours of theoretical lecture. This course is designed to introduce you to engineering survey principles and techniques in the contexts of Construction Engineering, Public Utilities, Municipal Engineering and Subdivision Construction. You will learn about the basic principles of geometric design of road and railway alignments, road structure, calculation of earthwork volumes and methods used for setting out such works. The course includes the development of fundamental formulae and demonstrates, through participation in practical exercises, the various field measurement techniques used in setting out these alignments. Computations associated with the measurements taken are also practiced.
Course objectives	On completion of this course you should be able to: 1. State the principles used in the geometric design of transport infrastructure 2. Identify the role of engineers and project managers in the process of land development / subdivision construction 3. Explain the importance of public utilities in construction engineering 4. Identify techniques and equipment used in engineering surveying projects and link them to theoretical concepts and 5. Use with proficiency a range of surveying equipment and analyse the accuracy of the equipment and results; 6. Undertake a range of basic engineering survey tasks, including basic computations required for horizontal and vertical alignments, earthworks and setting out surveys
Student's obligation	• This course is conducted as a series of weekly lectures, tutorials and student based field projects. The field projects have been designed to allow you to apply knowledge gained in lectures and provide practical experience in the use of specialised surveying equipment. The principles studied in key topics will also be reinforced in assignment tasks. • Attendance of students to the lectures • Conducting assignments • Conducting exams
Required Learning Materials	- Tutorials are prepared in the form of PowerPoint presentation by using data show. - Using white board to explain examples and offer more details.

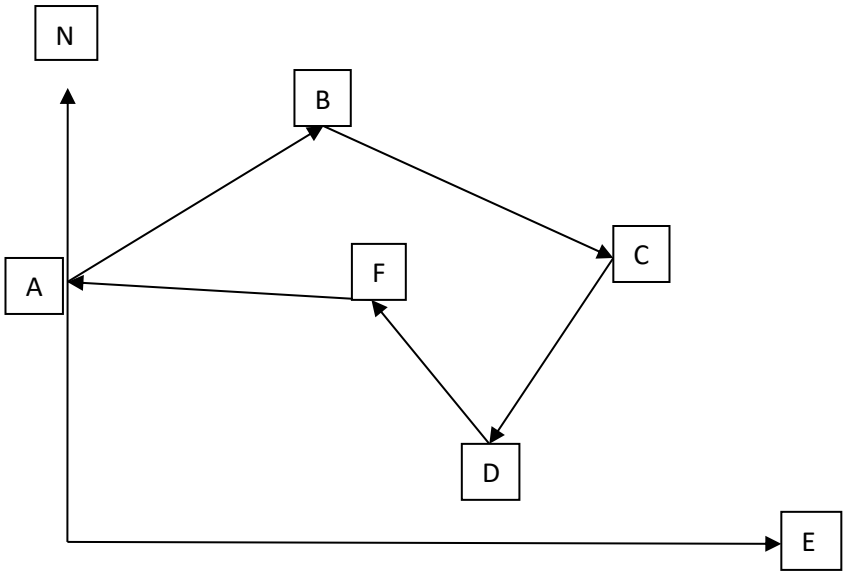
Assessment scheme	16% Mid Term (Theory) 4% Quiz 40% Assignment (report, paper, homework, seminar..) 0% final practical 40% final theory
Specific learning outcome:	On completion of this course you should be able to: 1. State the principles used in the geometric design of transport infrastructure 2. Identify the role of engineers and project managers in the process of land development / subdivision construction 3. Explain the importance of public utilities in construction engineering 4. Identify techniques and equipment used in engineering surveying projects and link them to theoretical concepts and 5. Use with proficiency a range of surveying equipment and analyze the accuracy of the equipment and results; 6. Undertake a range of basic engineering survey tasks, including basic computations required for horizontal and vertical alignments, earthworks and setting out surveys.
Course References:	You can use any book that clarified engineering surveying problems.. 1- Surveying -Vol. (1), B.C. Punmia (Standard Book House Delhi, India). 2- Engineering Surveying - Vol. (1), W.Schofield (Newness- Butter Worth, London, England). 3- Engineering for surveying – J.Uren and W.F.Price (Mac Millan, London , England). 4- Elementary Surveying (Twelfth Edition) Charles D. & Paul R. Wolf. 5- المسح الهندسي والكادسترائي ..... زياد عبد الجبار البكر

Course topics (Theory)	Week	Learning Outcome
Different methods of calculating areas in the field include: Calculating the regular shapes and dividing into triangles, Using columns in equal periods (trapezoid and Simpson), Using columns in unequal periods, Using coordinates and the method of multiplying longitude D.M.D	1	
Different methods of calculating the areas of the map include: division into triangles and the use of squares and graph paper lines, the use of slides, the use of the Plano meter when the fixation point is outside or inside the shape	2 & 3	
Mathematical and graphical methods for calculating cross-sectional areas of different shapes with different slopes of the Earth's surface	4 & 5	
Calculation of volumes of earthen quantities: using the law of the mean of the two bases, the deficient wedge and the approximate method of the longitudinal section, calculating the size of the quarry and the furnace by contour lines, performing calculations and drawing the enter transport curve	6 & 7	
Types of main curves (convex and concave), their symbols, terms and laws for calculating levels on them (the engineering method) and the equation for parabola to calculate the level (analytical method) and how to drop it on the ground	8	
Horizontal curves: simple circular horizontal curves, symbols, terms, laws, and specifications for it, complex and mirrored circular horizontal curves, their types and calculation of their data and uses	9	
Methods for dropping the simple circular curve, including: the deviation angles method using theodolite and tape or using only two theodolite devices or using the station station to drop this curve by coordinates control points and curve points.	10	

Method of using columns to project curves (columns on tangent and columns on large string) and method of projection from the point of intersection, obstacles to projecting and how to overcome them	11	
Transitional or spiral curves: types, uses, calculations, and methods for projecting them using deflection angles, strings, or coordinates	12	
Practical Topics	**Week**	**Learning Outcome**

Questions Example Design

Q1 / Using the balance departures and latitudes of traverse shown in (figure. 1), calculate the area of traverse by (D.M.D) method.



Line	Dep.	Lat.
AB	+4	+13
BC	+9	-5
CD	-4	-17
DF	-3	+12
FA	-6	-3

Figure. (1)

Solution:-

The Calculation done in tabular form as shown,

Side	Dep. (ΔE)	D.M.D	Lat. (ΔN)	2A (Double area)	Notes
AB	+4	+4	+13	+52	
BC	+9	+4 + 4 + 9 = +17	-5	-85	
CD	-4	+17 + 9 – 4 = +22	-17	-374	

DE	-3	+22 – 4 – 3 = +15	+12	+180	
EA	-6	+15 – 3 – 6 = +6	-3	-18	
Sum.	00 Check		00 Check	∑= - 245	

⇨ **2A = - 245**

$$A = |-\frac{245}{2}| = 122.5\ m2$$

Area of traverse **= 122.5 m²**

Extra notes:

External Evaluator

This course book is reviewed by (Sadiq R. Younes) as he is lecturer in Surveying department in Hawler Institute. He assessed and approved all content of the Computer Essentials subject as he admitted the course book is almost covered the several terms of Computer principls in both theoretical and practical aspects. The course can be presented in the classes for entire curriculum year.

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