Course Specification
(Bachelor)

Course Title:	**Surveying**
Course Code:	**COE3303**
Program:	**Bachelor of Construction Engineering**
Department:	**Civil and Environmental Engineering Department**
College:	**College of Engineering and Computing in Al-Qunfudhah**
Institution:	**UMM Al-Qura University**
Version:	**4**
Last Revision Date:	**March 2025**

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A. General information about the course:

1. Course Identification

1. Credit hours: (.....3...)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (...5/3.....)					
4. Course General Description:					
Introduction to surveying,Types of surveying, equipment and instruments, measurements of distances, elevations, angles and directions, cross section and profile, surveying and topographic maps, methods for setting out engineering projects, calculation of areas and volumes for earthworks, setting out circular, compound, transitional and vertical curves. Use GPS, Theodolite, levels and Total station. Contemporary applications, Lab sessions and experiments.					
5. Pre-requirements for this course (if any)**:**					
Calculus for engineering 2 **MTH1182**					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
By the completion of the course, the students should be able to: 1.1 Explain the surveying fundamentals, and errors. 1.2 Apply different techniques for surveying observations, such as distance, elevations, and angles. 1.3 Analyze and calculate the unknown surveying parameters, map productions, area and volume from ground data and maps. 1.4 Design of simple circular curve, and stakeout by deflection angles. 1.5 Use GPS, Theodolite, levels and Total station to measure distances, angles and coordinates, etc…					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	45
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify the principles of surveying, units, scale and the linear measurements, Area calculations, Leveling, Grid leveling and contouring, Earth work calculations and profiling, Theodolite and direction measurements.	**K1**	Lectures and team work	Assignment, quiz, Midterm, lab and final exam
1.2	Recognize	**K2**	Lectures and	Assignment,

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	contemporary issues in plane surveying.		homework	quiz, Midterm, lab and final exam
1.3	knowledge how to use different surveying instruments such as tape, level, theodolite, etc.	**K1**	Lectures and Lab works	Assignment, quiz, Midterm, lab and final exam
2.0	**Skills**			
2.1	Examine the details of surveying and its fundamental elements.	**S1**	Lectures and lab work	Assignment, quiz, Midterm, lab and final exam
2.2	Conduct surveying experiments and analyze and interpret data to solve surveying problems.	**S3**	Lectures, lab work and teamwork	Assignment, quiz, Midterm, lab and final exam
2.3	Evaluate surveying techniques, including leveling, grid leveling, and contouring.	**S1**	Lectures and lab work	Assignment, quiz, Midterm, lab and final exam
2.4	Utilize GPS, theodolite, levels, and total station to measure distances, angles, and coordinates accurately.	**S4**	Lectures and lab work	Assignment, quiz, Midterm, lab and final exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate the ability to work effectively in a	**V1**	Lectures and team work	Assignment, quiz, Midterm, lab and final

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	multidisciplinary team.			exam
3.2	Demonstrate effective communication and collaboration skills to integrate with others in solving problems.	**V2**	Lectures and team work	Assignment, quiz, Midterm, lab and final exam
…				

C. Course Content

No	List of Topics	Contact Hours
1.	**Definition and classification of surveying, measurement, accuracy and precision, significant figures, rounding off numbers.**	**2**
2.	**Definition and sources of errors, types of error, elimination of errors. Error propagation.**	**2**
3.	**Methods: pacing, stadia, taping, electronic distance measurements, and others equipment: surveying tapes, EDM instruments. Error and corrections.**	**2**
4.	**Elevation measurements [levelling].**	**4**
5.	**Angle measurements, Horizontal angles: azimuths, bearings, deflection angles, angles to the right, and others Vertical and zenith angles. Techniques.**	**4**
6.	**Midterm Exam**	**3**
7.	**Traversing and traverse computations. Open and closed traverses. Traverse classifications according to meaured**	**4**
8.	**Topographic surveys. Contour lines. Maps and scales.**	**3**
9.	**Area and volume computations. Methods of area and volume calculations. Area and volume computations from maps.**	**3**
10.	**Circular curves. Definition of circular curve parameters. Derivation of formulas. Curve layout by deflection angles.**	**3**
11.	**Tools and instruments used in surveying lab**	**45**
Total		**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	Each week	10%
2.	Quiz	3,9,12	10%
3.	Mid term exam.	7	20%
4.	Lab exam.	15	20%
5.	Final exam.	16 or 17	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Wolf, P. R., and Ghilani, C. D. "Elementary Surveying", 14th Edition, Prentice Hall, 2015
Supportive References	Barry F. K. and Gelnnbind, S. J. "Surveying, Principles and Applications", 9th Edition. Prentice Hall, 2014.
Electronic Materials	http://ocw.mit.edu/ http://www.sciencedirect.com.
Other Learning Materials	Computer software and internet.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture rooms with a capacity of at least 20 students and fitted with multimedia projector
Technology equipment (projector, smart board, software)	Data show, Smart Board
Other equipment (depending on the nature of the specialty)	Printers and laptops for staff members with required computer software programs are required.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Students' questioners running at the semester

Assessment Areas/Issues	Assessor	Assessment Methods
	Faculty members who teach this course	end. Analysis of students` Marks Regular feedback of the students about the course and the teaching methods
Effectiveness of Students assessment	Examination Committee	Direct: Peer review of examination papers and review or double check a minimum of three or 10% of answer papers.
Quality of learning resources	Faculty	Direct: Course Report
The extent to which CLOs have been achieved	Faculty	Direct and Indirect: Course report
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Civil and Environmental Engineering Department Council in Al-Qunfudah**
REFERENCE NO.	**The fifteenth session of the academic year 1446**
DATE	**01/05/2025**