



## Course Specifications

<b>Course Title:</b>	Surveying
<b>Course Code:</b>	CE 206
<b>Program:</b>	B.Sc. in Civil Engineering
<b>Department:</b>	Civil Engineering
<b>College:</b>	Jubail University College
<b>Institution:</b>	Jubail University College

## Table of Contents

<b>A. Course Identification</b> .....	<b>3</b>
6. Mode of Instruction (mark all that apply) .....	3
<b>B. Course Objectives and Learning Outcomes</b> .....	<b>3</b>
1. Course Description .....	4
2. Course Main Objective.....	3
3. Course Learning Outcomes .....	4
<b>C. Course Content</b> .....	<b>4</b>
<b>D. Teaching and Assessment</b> .....	<b>5</b>
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods .....	5
2. Assessment Tasks for Students .....	6
<b>E. Student Academic Counseling and Support</b> .....	<b>6</b>
<b>F. Learning Resources and Facilities</b> .....	<b>6</b>
1. Learning Resources .....	6
2. Facilities Required.....	7
<b>G. Course Quality Evaluation</b> .....	<b>7</b>
<b>H. Specification Approval Data</b> .....	<b>8</b>

## A. Course Identification

<b>1. Credit hours:</b>	3
<b>2. Course type</b>	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b>	Level 4, Second Year
<b>4. Pre-requisites for this course (if any):</b>	CE 202 Computer Graphics
<b>5. Co-requisites for this course (if any):</b>	None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	✓	100
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
<b>Contact Hours</b>		
1	Lecture	30
2	Laboratory/Studio	45
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	<b>75</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

*CE 206 Surveying (2-3-3)*

*Prerequisites: CE 202*

Introduction; measuring units, significant figures, direct distance measurement with tapes, tape corrections; electronic distance measurement; levels and leveling; longitudinal profiles and cross sections; contouring; area and volume computations; the theodolite and angular measurements; optical distance measurements; rectangular coordinates; traverse surveys and computations; mapping.

### 2. Course Main Objective

The main purpose of this course is to prepare students to recognize and operate the basic instruments used in surveying, classify the types of surveying and able to measure distances and angles with various surveying instruments. Student will also learn how to develop longitudinal profiles, cross sections, contour maps and areas and volumes computation.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge and Understanding</b>	
1.1	Demonstrate the knowledge of land surveying theory and practice to describe the various instruments used in the surveying and leveling	8
2	<b>Skills</b>	
2.1	Measure the horizontal and angular measurements used to describe the land surveying features.	1
2.2	Develop longitudinal profiles, cross sections, contour maps and calculate areas and volumes by conducting survey in the field.	6
2.3	Practice traverse computations to derive the map of an area.	1
3	<b>Values</b>	
	N/A	

### C. Course Content

No	List of Topics	Contact Hours
1	<b><u>Unit 1: Introduction</u></b> 1.1 Introduction to various topics in surveying 1.2 Introduction to various instruments used in surveying 1.3 Measuring units	5
2	<b><u>Unit 2: Direct Distance Measurement With Tapes</u></b> 2.1 Distance measuring Techniques 2.2 Taping accessories 2.3 Taping Techniques 2.4 Method of locating various features 2.5 Tape corrections	10
3	<b><u>Unit 3: Electronics Distance Measurement (EDM)</u></b> 3.1 Principles of Electronic Distance Measurement 3.2 EDM Instrument Characteristics 3.3 EDM Instrument Operation 3.4 Geometry of EDM	10
4	<b><u>Unit 4: Levels And Levelling</u></b> 4.1 Introduction to levelling and explanation of general terms 4.2 Levelling concepts and process 4.3 Levelling instruments 4.4 Techniques of levelling 4.5 Longitudinal profiles and cross sections. 4.6 Contouring	15
5	<b><u>Unit 5: Area And Volume Computations</u></b> 5.1 Calculation of area: Trapezoidal technique, Simpson's one – third rule, graphical analysis 5.2 Calculation of volume : Average end area method, Prismoidal formula	10
6	<b><u>Unit 6: Theodolite And Angular Measurement</u></b> 6.1 Introduction and definition of terms 6.2 Description of theodolite	5

	6.3 Optical Theodolite – Repeating and Direction 6.5 Total station 6.6 Adjustment of theodolite and Total station 6.7 Optical distance measurements 6.8 Angular Measurement by theodolite	
7	<b><u>Unit 7: Traverse Surveys And Computations</u></b> 7.1 Introduction 7.2 Open Traverse and Closed Traverse 7.3 Latitudes and Departures 7.4 Rectangular coordinates of Traverse stations 7.5 Area of closed Traverse by Coordinate method	15
8	<b><u>Unit 8: Mapping</u></b> 8.1 Introduction 8.2 Maps and Plans 8.3 Scales and Precision 8.4 Plan Plotting	5
9		
<b>Total</b>		75

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	<b>Knowledge and Understanding</b>		
1.1	Demonstrate the knowledge of land surveying theory and practice to describe the various instruments used in the surveying and leveling	Interactive learning Co-operative learning Self-directed learning	Quiz 1, midterm, assignment 1
2.0	<b>Skills</b>		
2.1	Measure the horizontal and angular measurements used to describe the land surveying features.	Interactive learning Self-directed learning Experiential Learning	Quiz 1, midterm, assignment 1
2.2	Develop longitudinal profiles, cross sections, contour maps and calculate areas and volumes by conducting survey in the field.		Assignment 2, quiz 2 & final
2.3	Practice traverse computations to derive the map of an area.		Assignment 2, quiz 2 & final
3.0	<b>Values</b>		
	N/A		

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	4	5%
2	Assignment 1	6	5%
3	Mid-term LB	7	5%
4	Mid-term LT	8	20%
5	Quiz 2	12	5%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
6	Assignment 2	14	5%
7	Lab Record	16	5%
8	Performance LB	16	10%
9	Final Exam -LB	16	10%
10	Final Exam LT	17-19	30%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

### Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Office hours 6 hr/week; students can go in times of office hours for teacher to explain what could not be understood from the lesson.
- Students can communicate with a staff member outside the official working hours by email.
- Students are also encouraged to visit their academic advisors.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<a href="#">Barry F Kavanagh</a> . (2012), <i>Surveying Principles and Applications</i> , Pearson Prentice Hall
<b>Essential References Materials</b>	<a href="#">Schofield.W</a> and <a href="#">Mark Breach</a> . (2007) <i>Engineering Surveying</i> , London: CRC Press. <a href="#">James M. Anderson</a> and <a href="#">Edward M. Mikhail</a> . (1997). <i>Surveying Theory and Practice</i> , London: McGraw-Hill Publications
<b>Electronic Materials</b>	None
<b>Other Learning Materials</b>	None

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture rooms with a capacity of at least 25 students and fitted with multimedia projector and a computer.  Survey Lab room to keep the surveying instruments and with a capacity of at least 15 students
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	None
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment as per QMS-Policy-006 Feedback Survey, QMS-QAP-116 Monitoring Students' Satisfaction	Students	Indirect: Analyzing the results of the following surveys Course Evaluation Survey(CES), Program Evaluation Survey (PES), Student Experience Survey (SES)
Quality of Exam papers and Verifying Standards of Student Achievement as per QMS-Policy-004 Policy for Examinations and Marking, QMS-ACP-102 Procedure for Marking Examinations	Examination Committee	Direct: Peer review of examination papers and review or double check a minimum of three or 10% of answer papers. Verifying the entries in the Activity Mark Sheet.
Achievement of learning outcomes as per QMS-Policy-001 Course Review, QMS-CDP-106, QMS-CDP-112 Curriculum Review	Faculty	Direct: Course Report (Section B-3)
Implementation of the action plans based on previous semester as per QMS-Policy-001 Course Review, QMS-CDP-106 Procedure for Course Review, QMS-CDP-112 Procedure for Curriculum Review	Faculty	Direct and Indirect: Course report (Section G-1, G-2)
Monitoring Teaching and Learning as per QMS-Policy-005 Monitoring of Teaching and Learning	Chairperson/Program Director/Course Director	Indirect: Feedback by Chairperson/Program director/Course director. Program Delivery Record.
Effectiveness of planned Teaching Strategies QMS-Policy-001 Course Review	Faculty	Indirect: Course Report (Section B-4)
Course effectiveness and planning for improvement as per QMS-Policy-001 Course Review, QMS-CDP-106 Procedure for Course Review, QMS- CDP-112 Procedure for Curriculum Review	Faculty	Direct and Indirect: Course report (Section G-3)
Verifying Standards of Student Achievement and Quality of Exam papers as per QMS-ACP-119 External Assessment Review	Assessment External Reviewer	Direct: Report of assessment external reviewer. Review of sample of ten or 10% of student's assessments and coursework scripts.

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	Civil Engineering Department Council
<b>Reference No.</b>	REG MIN-CED-10
<b>Date</b>	27-04-2020

### Appendix A Revision Details

Revision no.	DESCRIPTION	Reference MoMs			
		DC		CDC	
		Sem	#	Sem	#
1	Revision of Course Teaching Strategies and action verbs based on the comments of NCAAA reviewer	392	4	392	4
2	Course Specification Template 2018	402			