33Course Specification of Statistics

I. Course Identification and General Information:							
1	**Course Title:**	***Statistics***					
2	**Course Code & Number:**	CE205					
3	**Credit hours:**	C.H				**Credit Hours**	
		Th.	**Tu.**	**Pr.**	**Tr.**		
		2				2	
4	**Study level/ semester at which this course is offered:**	3th Level / 1st semester					
5	**Pre –requisite (if any):**	Math 4					
6	**Co –requisite (if any):**	----------					
8	**Program (s) in which the course is offered:**	Civil Engineering					
9	**Language of teaching the course:**	English+ Arabic					
10	**Location of teaching the course:**	Class room					
11	**Prepared By:**	Dr. Mohamed A.S. AL-Areeki					
12	**Date of Approval**						

Prepared by	Head of Department	Quality Assurance Unit	Dean of the Faculty	Academic Development Center & Quality Assurance
	Dr. Abdulkareem Yahya Al khattabi	Ass. Prof. Dr. Mohammad Algorafi	Prof. Dr. Mohammed AL-Bukhaiti	Ass. Prof. Dr. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas

II. Course Description:

This course enhances students' understanding to effectively use the basic concepts of statistics and probability for solving engineering problems. This course helps the students to develop an intuition and an interest for random phenomena, and it introduces both theoretical issues and applications that may be useful in real life like static data, probability, sampling theory , estimation , testing the hypothesis and correlation and regression.

III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a.1	Define mathematics related to statistic , statistical parameters	**A1**
a2	Identify the principles technique of statistic	**A3**
b.1	Develop notions of possible and favorable outcomes of an experiment; intuitive probability.	**B1**
b.2	Identify appropriate mathematical and computer-based methods for analyzing engineering problems using statistic Knowledge.	**B2**
b.3	Demonstrate proficiency in the integration of information and processes in statistic	**B3**
c.1	Apply appropriate mathematical and computer-based methods for analyzing engineering problems using statistic Knowledge.	**C3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a.1- Define mathematics related to statistic, statistical parameters	Lecture Multimedia Presentations Presentations Tutorial Reading	Problem set- Written exam- Written assignment
a.2- Identify the principles technique of statistic	Lecture Individual/group projects Presentations	Problem set- Written exam- Written assignment

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b.1- Develop notions of possible and favorable outcomes of an experiment; intuitive probability.	Lecture Multimedia Presentations Presentations Tutorial Reading	Participation- Written assignment
b.2- Identify appropriate mathematical and computer-based methods for analyzing engineering problems using statistic Knowledge.	Lecture Multimedia Presentations Presentations Tutorial	Project- Written assignment
b.3- Demonstrate proficiency in the integration of information and processes in statistic	Presentations Tutorial	Written exam -

C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Apply appropriate mathematical and computer-based methods for analyzing engineering problems using statistic Knowledge.	Lecture Presentations Tutorial	Written assignment- Written exam

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IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	1- Presentation and Description of static data	a1-b1-c1	1-Introduction 2- Presentation of data 3- Frequency Distribution 4-Comulative Frequency Distribution 5-Graphic Presentation 6-Forms of Distribution 7- Measures of Central Tendency (Arithmetic Mean, Geometrical Mean, Median and Mode) 8-Quartile, Deciles and Percentile 9- Measures of Desperation (The Mean Defilation, The Variance, The Standard Deviation and Coefficient of Variation) 10-Measures of Skewness 11- Measures of Kurtosis	3	6
2	2-Probability	a1-a2-b1-b2-b3--c1	1-Introduction (Sets) 2-Sample Space 3-Rules of Multiplications and Addition. 4-Permutations and Combinations. 5-Probability Definition 6-Conditional probability 7-Baye's Theorem 8-Probability Tree 9-Independence	2	4
3	3-Random Variables and Probability Distributions	a1-a2-b1-b2-b3-c1	1-Random Variables 2- Discrete Probability Distributions 3-Mathematical Expectations 4-The Binomial Distribution	2	4

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IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
			5-Poison Distribution 6- Continuous Probability Distribution 7-Normal Distribution, t-Distrib, Chi-Distrib, and the F-Distrib. 8-Bivariate Random Variables		
4	3-Random Variables and Probability Distributions	a1-a2-b1-b2-b3-c1	1-Random Variables 2- Discrete Probability Distributions 3-Mathematical Expectations 4-The Binomial Distribution 5-Poison Distribution 6- Continuous Probability Distribution 7-Normal Distribution, t-Distrib, Chi-Distrib, and the F-Distrib. 8-Bivariate Random Variables	1	2
5	4-Introduction to Sampling Theory	a1-b1-c1	1-Sampling Methods 2-Sampling Distributions	1	2
6	5-Statistical Estimation	a1-a2-b1-b2-b3-c1	1-Connfidence Interval for Means	1	2
7	Testing o Hypothesis	a1-a2-b1-b2-b3-c1	Tests abut means Tests abut Variance	1	2
8	Correlation and Regression	a1-a2-b1-b2-b3-c1	Linear Correlation Regression line Estimate of Variance of Regression line (Sum of Squares, Sum of Squares for regression and Sum of Squares for Errors) Confidence Intervals Concerning A and B. Multi regression	3	6

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
Number of Weeks /and Units Per Semester				**14**	**28**

V. Teaching strategies of the course:

Lecture
Multimedia Presentations
Presentations
Tutorial
Reading
Small group working
Independent study

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Presentation and Description of static data	a1-b1-c1	1-3	1
2	Probability	a1-a2-b1-b2-b3--c1	4-5	0.5
3	Random Variables and Probability Distributions	a1-a2-b1-b2-b3-c1	6-8	1
4	Introduction to Sampling Theory	a1-b1-c1	9	0.5
5	5-Statistical Estimation	a1-a2-b1-b2-b3-c1	10	1
6	Testing o Hypothesis	a1-a2-b1-b2-b3-c1	11	0.5
7	Correlation And Regression	a1-a2-b1-b2-b3-c1	12-14	0.5

Prepared by: Head of Department, Dr. Abdulkareem Yahya Al khattabi
Quality Assurance Unit, Ass. Prof. Dr. Mohammad Algorafi
Dean of the Faculty, Prof. Dr. Mohammed AL-Bukhaiti
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VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Written assignment	1-14	5	5	a1-a2-b1-b2-b3-c1
2	Quizzes.	Three time randomly	5	5	b3-c1
3	Mid-term exam.	7^{th}	20	20	a1-a2-b2-b3-c1
4	Final-exam.	13	70	70	a1-a2-b2-b3-c1
	Sum		**100**	**100%**	

VIII. Learning Resources:

- Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1-"A course in Probability", Neil A. Weiss,Pearson,2006

2- Essential References.

1-"Introduction to Probability And Statistics", J.SusanMilton,Jesse C. Arnold, 4th ed 2003

3- Electronic Materials and Web Sites *etc*.

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IX. Course Policies:	
1	**Class Attendance:** The students should have more than 75 % of attendance according to rules and regulations of the faculty.
2	**Tardy:** The students should respect the timing of attending the lectures. They should attend within 1 minutes from starting of the lecture.
3	**Exam Attendance/Punctuality:** The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam.
4	**Assignments & Projects**: The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time.
5	**Cheating:** If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for enquiries.
6	**Plagiarism:** The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university.
7	**Other policies**: -All the teaching materials should be kept out the examination hall. -The mobile phone is not allowed. -There should be a respect between the student and his teacher.

Reviewed By	**Vice Dean for Academic Affairs and Post Graduate Studies** **Dr. Tarek A. Barakat** **Dr. Abdulla Noman**
	Deputy Rector for Academic Affairs Dr. Ibrahim AlMutaa **Dr. Ahmed mujahed** **Dr. Munaser Alsubri**

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Template for Course Plan (Syllabus) of Statistics

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member	Dr. Mohamed A.S. AL-Areeki	**Office Hours**						
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail				8-10			

II. Course Identification and General Information:						
1-	**Course Title:**	***Statistics***				
2-	**Course Number & Code:**	CE205				
3-	**Credit hours:**	**C.H**				**Credit Hours**
		Th.	**Tu.**	**Pr.**	**Tr.**	
		2				2
4-	**Study level/year at which this course is offered:**	3rd Level/ 1st semester				
5-	**Pre –requisite (if any):**	Math4				
6-	**Co –requisite (if any):**	----------				
7-	**Program (s) in which the course is offered**	Civil Engineering				
8-	**Language of teaching the course:**	English+ Arabic				
9-	**System of Study:**	Regular				
10-	**Mode of delivery:**	Lecture				
11-	**Location of teaching the course:**	Class				

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III. Course Description:

This course enhances students' understanding to effectively use the basic concepts of statistics and probability for solving engineering problems. This course helps the students to develop an intuition and an interest for random phenomena, and it introduces both theoretical issues and applications that may be useful in real life like static data, probability, sampling theory , estimation , testing the hypothesis and correlation and regression.

IV. Intended learning outcomes (ILOs) of the course:

- **Brief summary of the knowledge or skill the course is intended to develop:**

a.1 Define mathematics related to statistic, statistical parameters A1
a.2 Identify the principles technique of statistic A3
b.1 Develop notions of possible and favorable outcomes of an experiment; intuitive probability. B1
b.2 Identify appropriate mathematical and computer-based methods for analyzing engineering problems using statistic Knowledge. B2
b.3 Demonstrate proficiency in the integration of information and processes in statistic B3
c.1 Apply appropriate mathematical and computer-based methods for analyzing engineering problems using statistic Knowledge. C3

V. Course Content:

- **Distribution of Semester Weekly Plan Of course Topics/Items and Activities.**

A – Theoretical Aspect:

Order	Topics List	Sub Topics List	Week Due	Contact Hours
1	Presentation and Description of static data	1-Introduction 2- Presentation of data 3- Frequency Distribution 4-Comulative Frequency Distribution 5-Graphic Presentation 6-Forms of Distribution	1,2,3	6

V. Course Content:

- **Distribution of Semester Weekly Plan Of course Topics/Items and Activities.**

A – Theoretical Aspect:

Order	Topics List	Sub Topics List	Week Due	Contact Hours
		7- Measures of Central Tendency (Arithmetic Mean, Geometrical Mean, Median and Mode) 8-Quartile, Deciles and Percentile 9- Measures of Desperation (The Mean Defilation, The Variance, The Standard Deviation and Coefficient of Variation) 10-Measures of Skewness 11- Measures of Kurtosis		
2	Probability	1-Introduction (Sets) 2-Sample Space 3-Rules of Multiplications and Addition. 4-Permutations and Combinations. 5-Probability Definition 6-Conditional probability 7-Baye's Theorem 8-Probability Tree 9-Independence	4,5	4
3	Random Variables and Probability Distributions	1-Random Variables 2- Discrete Probability Distributions 3-Mathematical Expectations 4-The Binomial Distribution 5-Poison Distribution 6- Continuous Probability Distribution 7-Normal Distribution, t-Distrib, Chi-Distrib, and the F-Distrib. 8-Bivariate Random Variables	6,7	6
4	Midterm Exam		8	2

V. Course Content:

- **Distribution of Semester Weekly Plan Of course Topics/Items and Activities.**

A – Theoretical Aspect:

Order	Topics List	Sub Topics List	Week Due	Contact Hours
5		1-Random Variables 2- Discrete Probability Distributions 3-Mathematical Expectations 4-The Binomial Distribution 5-Poison Distribution 6- Continuous Probability Distribution 7-Normal Distribution, t-Distrib, Chi-Distrib, and the F-Distrib. 8-Bivariate Random Variables	9	2
6	Introduction to Sampling Theory	1-Sampling Methods 2-Sampling Distributions	10	2
7	Statistical Estimation	1-Connfidence Interval for Means	11	2
8	Testing o Hypothesis	Tests abut means Tests abut Variance	12	2
9	Correlation and Regression	Linear Correlation Regression line Estimate of Variance of Regression line (Sum of Squares, Sum of Squares for regression and Sum of Squares for Errors) Confidence Intervals Concerning A and B. Multi regression	13,14, 15	6
10	Final Exam		16	2
Number of Weeks /and Units Per Semester			**16**	**32**

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No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Presentation and Description of static data	a1-b1-c1	1-3	1
2	Probability	a1-a2-b1-b2-b3--c1	4-5	0.5
3	Random Variables and Probability Distributions	a1-a2-b1-b2-b3-c1	6-8	1
4	Introduction to Sampling Theory	a1-b1-c1	9	0.5
5	Statistical Estimation	a1-a2-b1-b2-b3-c1	10	1
6	Testing o Hypothesis	a1-a2-b1-b2-b3-c1	11	0.5
7	Correlation And Regression	a1-a2-b1-b2-b3-c1	12-14	0.5

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Written assignment	1-14	7.5	5
2	Quizzes.	Three time randomly	7.5	5
3	Mid-term exam.	7^{th}	30	20
4	Final-exam.	13	90	60
5	Project	7	15	10

Prepared by — Head of Department: Dr. Abdulkareem Yahya Al khattabi

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X. Course Policies:	
Unless otherwise stated, the normal course administration policies and rules of the Faculty of Engineering apply. For the policy, see: ----------	
1	**Class Attendance:** The students should have more than 75 % of attendance according to rules and regulations of the faculty.
2	Tardy: The students should respect the timing of attending the lectures. They should attend within 1 minutes from starting of the lecture.
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