

Course Description Form

1. Course Name: Statistical Applications in Civil Engineering	
2. Course Code:	
CIV-025	
3. Semester / Year: second semester/2025	
4. Description Preparation Date: 3/09/2025	
5. Available Attendance Forms: Bologna system attendance form	
6. Number of Credit Hours (Total) / Number of Units (Total): SSWL 63 + USSWL 62; ECTS 5	
7. Course administrator's name (mention all, if more than one name)	
Name: Ahmed A Shareef Email: ahmed.nas@uowa.edu.iq	
8. Course Objectives	
Course Objectives	1. Developing problem-solving skills and understanding the fundamentals of statistics. 2. Understanding different types of statistical data sets and how to represent them in various ways, such as tables and charts. 3. Describing data sets using numerical methods, such as measures of central tendency, data distribution, and dispersion. 4. Understanding the fundamentals of probability theory. 5. Understanding probability distributions, for example, discrete probability distribution, normal distribution, and binomial distribution. 6. Understanding the basics of regression and correlation analysis, with greater focus on linear regression.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is due to the students' contribution in class discussions and problem solving, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive explaining the module basics and by considering types of examples that are interesting to the students.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	1	Introduction to statistics, identifying sources, statistical terminology, selecting information.	Lectures	NA
2	3	1	Statistical distributions, frequency table, graphical representation of distributions.	Lectures	Quizzes
3	3	1	Measures of central tendency (mean, mode, and median), geometric mean, harmonic mean.	Lectures	and
4	3	1	Comparison of measures of central tendency (mean, mode, and median).	Lectures	HWs
5	3	1	Measures of variation and dispersion: standard deviation, variance, and coefficient of variation.	Lectures	Quizzes
6	3	1	Positional measures: percentiles, deciles, quartiles.	Lectures	and
7	3	1	Shape measures: skewness and kurtosis.	Lectures	HWs
8	3	1	Fundamentals of probability theory (introduction), Venn diagrams, intersection and union in probability theory.	Lectures	HW
9	3	1	Conditional probability.	Lectures	Quizzes
10	3	1	Independent events, mutually exclusive events.	Lectures	and
11	3	1	Permutations and combinations, multiplication rule and addition rule.	Lectures	HW
12	3	1	Sampling distribution of sample means.	Lectures	Quizzes
13	3	1	Discrete probability distributions, binomial distribution.	Lectures	and
14	3	1	Multinomial distribution, Poisson distribution.	Lectures	HW
15	3	1	Related probability distributions, normal distribution.	Lectures	
16	3	1	Applications of probability distribution in civil engineering contexts.		
11. Course Evaluation					
Mid-term exam		10%			
HWs		10%			

Quizzes	10%
Technical reports	10%
Attendance sheet	10%
Final Exam	50%
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1. Mann, Prem S. "INTRODUCTORY STATISTICS", John Wiley & Sons, 5th edition, 2003. 2. نعمة حمد عمارة وسحر شاکر توفیق: الإحصاء وتطبيقاته الهندسية.
Main references (sources)	د. نعمة حمد عمارة وسحر شاکر توفیق: الإحصاء وتطبيقاته الهندسية
Recommended books and references (scientific journals, reports...)	1. Mann, Prem S. "INTRODUCTORY STATISTICS", John Wiley & Sons, 5th edition, 2003. 2. نعمة حمد عمارة وسحر شاکر توفیق: الإحصاء وتطبيقاته الهندسية.
Electronic References, Websites	