MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering statistics**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**FETE244**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	UGII		**Semester of Delivery**	**4**	
Administering Department	**Fuel and Energy Technologies Engineering**		**College**	**Shatt Al-Arab University College**	
Module Leader	**Hajir Sahib Shnawa**		**e-mail**	**hajer.saheb@gmail.com**	
Module Leader's Acad. Title	**Assistant Lecturer**		**Module Leader's Qualification**	**M.Sc**	
Module Tutor	**Hajir Sahib Shnawa**		**e-mail**	Email	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	It's used for experimental design. It's used for analyzing results of experiments It's used to find a mathematical model for experiments. It's used for comparing between theoretical model and experimental data.	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introducing the student to the importance of statistics and its relationship to engineering sciences. 2. clarifying the fields in which it is used and the purpose of using it, as well as identifying the applied methods necessary to diagnose and solve problems and applying them to ready-made programs, for example, Microsoft excel 2007 electronic spreadsheet program. 3. The student acquires practical skills in the areas of using statistical methods. 4. applications and data collection methods Presented in various ways and applications of measures of central tendency, measures of dispersion, correlation, regression, and solving equations using matrices and determinants.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student able to: 1. Identify modern concepts of statistics, emphasizing applications to quality engineering and improvement, process capability and control and reliability assessment. 2. Demonstrate the use of statistical software tools to solve problems. 3. Employ statistical methods to perform statistical quality control, design of experiments and reliability analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following:
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Quizzes, reports, seminars, Practical testing and Online testing.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,6, 9,12	
	Assignments	2	10% (10)	6, 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	
Summative assessment	Midterm Exam	2 hr	10% (10)	7	
	Final Exam	2hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	1. Introduction to Statistic. 2. Graphical methods for describing Quantitative Data: An Introduction to Descriptive Statistics.
Week 2	1.frequency distribution. 2.relative frequency. 3.Computer Exercises: Pie chart, Histogram, steam and leaf, dot plot.
Week 3	1.Numerical methods for describing quantitative data: Measures of Central Tendency: arithmetic mean, median.
Week 4	1. variance, standard deviation, and mode. 2. Measures of Relative Standing: percentiles and quartiles. 3. Methods of detecting outliers (Range)
Week 5	Types of Random Variables: 1.Discrete Random Variables. 2. Continuous Random Variables.
Week 6	1. Normal Distributions and Interval Tests 2. Introduction to the normal distribution.
Week 7	Testing for a normal distribution. Sampling Distributions. Estimation using Confidence Intervals
Week 8	Statistical Inference and Significance Testing: Introduction to Estimation, Types of Estimates.
Week 9	Confidence interval, Hypothesis Tests, Type I and type II errors
Week 10	Chi-square value, one and two tails tests. Significance tests for population means.

Week 11	Comparing two sample means. Wilcoxon signed-rank and Mann–Whitney tests. Applications
Week 12	Design of experiments: 2 nd and 3rd factorial experiments.
Week 13	graphic presentation, confounding, quality improvement
Week 14	Taguchi Design of Experiments.
Week 15	ANOVA, P-value, Fisher's test.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1& 2	General definitions of Excel and MATLAB environment.
Week 3	Learn about commands for statistical measures.
Week 4	Practical application 1.frequency distribution. 2.relative frequency. 3.Computer Exercises: Pie chart, Histogram, steam and leaf, dot plot.
Week 5 & 6	1.Numerical methods for describing quantitative data: Measures of Central Tendency: arithmetic mean, median. 1. variance, standard deviation, and mode. 2. Measures of Relative Standing: percentiles and quartiles. 3. Methods of detecting outliers (Range)
Week 7	Types of Random Variables: 1.Discrete Random Variables. 2. Continuous Random Variables. 1. Normal Distributions and Interval Tests 2. Introduction to the normal distribution. Testing for a normal distribution. Sampling Distributions. Estimation using Confidence Intervals
Week 8-9	Statistical Inference and Significance Testing: Introduction to Estimation, Types of Estimates. Confidence interval, Hypothesis Tests, Type I and type II errors Chi-square value, one and two tails tests. Significance tests for population means.
Week 10	Chi-square value, one and two tails tests. Significance tests for population means. Comparing two sample means. Wilcoxon signed-rank and Mann–Whitney tests. Applications
Week 11	Design of experiments: 2 nd and 3rd factorial experiments.
Week 12	graphic presentation, confounding, quality improvement

Week 13	Taguchi Design of Experiments.
Week 14	ANOVA, P-value, Fisher's test.
Week 15	Final exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. David M. Levine, Patricia P. Ramsey, & Robert K. Smith. Applied Statistics for Engineers and Scientists: Using Microsoft Excel & Minitab. Prentice-Hall, 2001 2. Thomas J. Lorenzen & Virgil L. Anderson. Design of Experiments: A No-name Approach.m. Dekker.1993. 4. William Mendenhall & Terry Sincich. Statistics for Engineering and the Sciences, 5th Edition. Prentice-Hall, 2007	no
Recommended Texts	1. Douglas C. Montgomery, Design and Analysis of Experiments, 7 Edition, Wiley, July 2008.	no
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.