

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Mathematics		Module Delivery	
Module Type	S		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CET2101			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		3
Administering Department	CET	College	CET	
Module Leader	Adnan Mohammed Ali Mohammed		e-mail	dnan70816@gmail.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Adnan Mohammed Ali Mohammed		e-mail	dnan70816@gmail.com
Peer Reviewer Name	Alaa Wagih Abdulqader	e-mail	alaa_wagih@baghdadcollege.edu.iq	
Scientific Committee Approval Date	16/9/2024	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET1204	Semester	Two
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To develop problem solving skills and understanding of probability theory.</li> <li>2. To distinguish aspects of probability terminology.</li> <li>3. This course deals with the basic concept of Statistics.</li> <li>4. To understand graphical representation of data measures.</li> <li>5. To perform Simple Linear Regression.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Recognize Basic terminology.</li> <li>2. Describe Axioms for probability.</li> <li>3. Discuss Conditional probabilities and independent events.</li> <li>4. Explain random variable, Expectation and variance.</li> <li>5. understand Bayes Theorem, PDF and CDF.</li> <li>6. Define Expectation and variance of continuous random variables.</li> <li>7. Identify Binomial, Poisson and Normal Distribution.</li> <li>8. Discuss Joint and Marginal distributions aspects.</li> <li>9. Discuss the Distributions of sums of independent random variables.</li> <li>10. Explain Expectation and variance of sums of random variables, in addition to Covariance and correlation.</li> <li>11. Describe Conditional expectation and Prediction.</li> <li>12. Discuss Graphical Representation of frequency tables and charts, Measures of Central Tendency, and Dispersion.</li> <li>13. Get acquainted with Relationship Modelling, Pearson's Correlation Coefficient.</li> <li>14. Explain Significance of the correlation co-efficient and Simple Linear Regression.</li> <li>15. Describe Chi Square test for association, Chi Square test of goodness of fit.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><u>Part A - Probability</u> This part includes Sample spaces and events. Axioms for probability and their consequences. Conditional probabilities. Bayes' formula. Independent events. Definition of random variable. Discrete random variables. Expectation and variance. Bayes Theorem, Discrete Probability Distributions, The cumulative distribution function. Probability density function. Expectation and variance of continuous random variables. Binomial Distribution, Poisson Distribution, The Normal Distribution, Joint distribution functions. Marginal distributions. Independent random variables. Distributions of sums of independent random variables. Expectation and variance of sums of random variables. Covariance and correlation. Conditional expectation. Prediction. <b>[33 hrs]</b> + Revision problem classes in weekly tutorials <b>[11 hrs]</b></p> <p><u>Part B - Statistics</u> This part will take in details Graphical Representation - frequency tables and charts, Measures of Central Tendency, and Dispersion. Relationship Modelling, Pearson's Correlation Coefficient Significance of the correlation co-efficient, Simple Linear Regression Chi Square test for association, Chi Square test of goodness of fit <b>[12 hrs]</b> + Revision problem classes in weekly tutorials <b>[4 hrs]</b></p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.
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## Student Workload (SWL)

### الحمل الدراسي للطالب موزع على (15) اسبوع

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.13
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1-4 , LO #5-9
	<b>Assignments</b>	2	20% (10)	4, 11	LO # 1-3 , LO # 4- 10
	<b>Projects / Lab.</b>	N/A			
	<b>Report</b>	1	10% (10)	15	LO # 1-14
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Basic terminology, Populations and Samples.
<b>Week 2</b>	Sample spaces and events. Axioms for probability and their consequences.
<b>Week 3</b>	Conditional probabilities. Bayes' formula. Independent events.
<b>Week 4</b>	Definition of random variable. Discrete random variables. Expectation and variance.
<b>Week 5</b>	Bayes Theorem, Discrete Probability Distributions, The cumulative distribution function.
<b>Week 6</b>	Probability density function. Expectation and variance of continuous random variables.
<b>Week 7</b>	Binomial Distribution, Poisson Distribution, The Normal Distribution

<b>Week 8</b>	<b>Midterm Exam</b>
<b>Week 9</b>	Joint distribution functions. Marginal distributions. Independent random variables. Distributions of sums of independent random variables.
<b>Week 10</b>	Expectation and variance of sums of random variables. Covariance and correlation.
<b>Week 11</b>	Conditional expectation. Prediction.
<b>Week 12</b>	Graphical Representation - frequency tables and charts, Measures of Central Tendency, and Dispersion.
<b>Week 13</b>	Relationship Modelling, Pearson's Correlation Co-efficient
<b>Week 14</b>	Significance of the correlation co-efficient, Simple Linear Regression
<b>Week 15</b>	Chi Square test for association, Chi Square test of goodness of fit
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي الاضافي

#### Material Covered

Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	"Probability & Statistics for Engineers & Scientists", Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying E. Ye, Pearson Education, 9th edition, (August 19, 2016), ISBN-13:978-1292161365.	Yes
<b>Recommended Texts</b>	"Essential Mathematics and Statistics for Science", Graham Currell, Antony Dowman, Wiley, 2nd edition (June 22, 2009), ISBN-13:978-0470694480.	No
<b>Websites</b>	<a href="https://users.cs.utah.edu/~jeffp/teaching/cs3130.html">https://users.cs.utah.edu/~jeffp/teaching/cs3130.html</a>	

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
<p><b>Note:</b> 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.</p>				