

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

### الأحصاء / Statistics

Module Information			
معلومات المادة الدراسية			
Module Title	Statistics		Module Delivery
Module Type	Basic		<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	CREQ310		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	5
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Asst. Lact. Hind Dhia'a Ridha	e-mail	hind.diaa@nahrainuniv.edu.iq
Module Leader's Acad. Title	Asst. Lact.	Module Leader's Qualification	M.Sc.
Module Tutor	Asst. Lact. Hind Dhia'a Ridha	e-mail	hind.diaa@nahrainuniv.edu.iq
Peer Reviewer Name	Prof. Dr. Mahmud Rasheed Ismail	e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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 introduce statistics and its applications for engineering student</li> <li>2. To identify the types Statistics values and methods to arrange them.</li> <li>3. To identify the Statistical coefficients, applications and Statistical representation for grouped and ungrouped data.</li> <li>4. To know the method of graphical representation of statistical data.</li> <li>5. To able of analyzing the statistical data reaching to the conclusions.</li> <li>6. Ability to treating the probability problems.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. describe what "statistics" means in the context of this course, explain the process of statistics, distinguish between qualitative and quantitative variables, distinguish between discrete and continuous variables</li> <li>2. Organize types of data; Raw Data, Frequency Distributions, Relative Frequency and Percentage Distributions, and Construct Frequency Distribution Tables.</li> <li>3. Identify the graphical representation of statistical data. Like stem and leaf, bar chart, pi chart, histogram.</li> <li>4. Identify the central tendency and its variables (mode, mean, median, variance and standard deviation).</li> <li>5. Ability to analyzing the data convergence using quartiles analysis, percentiles and and box and whiskers plots.</li> <li>6. Knowing probability definition ( experiments, outcomes and sample space).</li> <li>7. Identify marginal and conditional probability.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Statistics definitions, process of statistics, distinguish between qualitative and quantitative variables, distinguish between discrete and continuous variables [8hr]</p> <p>Types of data; Raw Data, Frequency Distributions, Relative Frequency and Percentage Distributions, and Construct Frequency Distribution Tables. [8hr]</p> <p>The graphical representation of statistical data. Like stem and leaf, bar chart, pi chart, histogram. [12hr]</p> <p>Central tendency and its variables (mode, mean, median, variance and standard deviation). [12hr]</p> <p>Analyzing the data convergence using quartiles analysis, percentiles and and box and whiskers plots. [8hr]</p> <p>Probability definition ( experiments, outcomes and sample space). [8hr]</p> <p>Identify marginal and conditional probability. [8hr]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	15% (15)	5, 10	LO #1, 2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,8,15	LO # 3, 5, 6 and 7
	<b>Projects / Lab.</b>	-	-	-	-
	<b>Report</b>	-	-	-	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exams</b>	2	20% (20)	7,13	LO # 1-3, LO # 4-6
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Statistics definitions, process of statistics.
<b>Week 2</b>	Distinguish between qualitative and quantitative variables, distinguish between discrete and continuous variables.
<b>Week 3</b>	Types of data; Raw Data, Frequency Distributions, Relative Frequency  Probability definition ( experiments, outcomes and sample space). [8hr]  Identify marginal and conditional probability. [8hr]
<b>Week 4</b>	Percentage Distributions, and Construct Frequency Distribution Tables.
<b>Week 5</b>	The graphical representation of statistical data stem and leaf, bar chart
<b>Week 6</b>	The graphical representation of statistical data. pi chart, histogram.
<b>Week 7</b>	Central tendency and its variables (mode, mean, median)
<b>Week 8</b>	Central tendency and its variables (variance and standard deviation).
<b>Week 9</b>	Applications of central tendency.
<b>Week 10</b>	Analyzing the data convergence using quartiles analysis.
<b>Week 11</b>	Analyzing the data convergence using percentiles and box and whiskers plots.
<b>Week 12</b>	Probability definition, importance and applications.
<b>Week 13</b>	Experiments, outcomes and sample space
<b>Week 14</b>	Marginal and conditional probability.
<b>Week 15</b>	Applications and case study of Probability
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	

Week 7	
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Theory and Problems of Statistics 3rd ed. - M. Spiegel, L. Stephens Mc Graw Hill -1991	Yes
Recommended Texts	FUNDAMENTALS OF PROBABILITY AND STATISTICS FOR ENGINEERS. -T.T. Soong John Wiley & Sons Ltd - 2004	No
Websites	<a href="https://www.statistics">https://www.statistics</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>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Advance Manufacturing		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER424		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	09	College	03
Module Leader	Ahmed Abdulsameea Alduroobi	e-mail	ahmed.alduroobi@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Scientific committee	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Introducing students to modern methods of manufacturing processes.</li> <li>2. Educating students on additive manufacturing techniques.</li> <li>3. Identify the features and determinants of additive manufacturing technology.</li> <li>4. Determine the materials used in the additive manufacturing.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. An introduction to additive manufacturing processes.</li> <li>2. Comparison of conventional manufacturing processes and additive manufacturing processes.</li> <li>3. Learn about the applications of additive manufacturing process.</li> <li>4. Accurately identify the SLA process.</li> <li>5. Study the variables that affect the SLA process.</li> <li>6. Learn the determinants of the SLA process</li> <li>7. Accurately identify the FDM process.</li> <li>8. Study the variables that affect the FDM process.</li> <li>9. Learn the determinants of the FDM process.</li> <li>10. Learn about modern additive manufacturing methods that related in Prosthetics and orthotics field.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A – The Generic AM Process:</u></p> <p>At this stage;</p> <ul style="list-style-type: none"> <li>- students will learn Distinction Between AM and CNC Machining based on Material, Speed, Complexity, Accuracy, Geometry, Programming.</li> <li>- The Eight Steps in Additive Manufacture which include (Conceptualization and CAD, Conversion to STL/AMF, Transfer to AM Machine and STL File Manipulation , Machine Setup , Build , Removal and , Post-Processing, Application.</li> <li>- Medical Modeling, Reverse Engineering Data, Architectural. [20]</li> </ul> <p><u>Part B – Vat Photopolymerization Processes:</u></p> <p>At this point, Vat Photopolymerization Materials, Curable , Overview of Photopolymer Chemistry , Resin Formulations and Reaction Mechanisms will be demonstrated.[ 20]</p> <p><u>Part C – Extrusion-Based Systems:</u></p> <p>At this stage, Material Loading , Liquification ,Extrusion, Solidification, Positional Control , Bonding , Support Generation , Plotting and Path Control will be demonstrated.[ 20]</p>

	<p>Part D - Software Issues for Additive Manufacturing:</p> <p>At this stage, Preparation of CAD Models, The STL File , STL File Format, Binary/ASCII . , Creating STL Files from a CAD System , Calculation of Each Slice Profile , Technology-Specific Elements will be demonstrated.[ 12]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The strategy of this course is to teach students advanced manufacturing mechanisms, including the additive manufacturing mechanism. Also, to learning about the materials used in this technique, as well as the determinants and advantages of these modern manufacturing methods.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	39	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> 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, 2, 10 and 11
	<b>Assignments</b>	4	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	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

	Material Covered
<b>Week 1</b>	What Is Additive Manufacturing? What Are AM Parts Used for? The Generic AM Process.
<b>Week 2</b>	Distinction Between AM and CNC Machining
<b>Week 3</b>	CAD , Conversion to STL , Transfer to AM Machine and STL File Manipulation.
<b>Week 4</b>	Machine Setup, Build , Removal , Post-processing , Application.
<b>Week 5</b>	Classification of AM Processes.
<b>Week 6</b>	Liquid Polymer Systems , Discrete Particle
<b>Week 7</b>	Molten Material Systems , Solid Sheet Systems.
<b>Week 8</b>	Mid exam
<b>Week 9</b>	Vat Photopolymerization1
<b>Week 10</b>	Vat Photopolymerization2
<b>Week 11</b>	Extrusion-Based Systems1
<b>Week 12</b>	Extrusion-Based Systems2
<b>Week 13</b>	Report
<b>Week 14</b>	Software Issues for Additive Manufacturing1
<b>Week 15</b>	Software Issues for Additive Manufacturing2
<b>Week 16</b>	<b>Final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Conceptualization and CAD
<b>Week 2</b>	Lab 2: Conversion to STL/AMF
<b>Week 3</b>	Lab 3: Transfer to AM Machine and STL File Manipulation
<b>Week 4</b>	Lab 4: Machine Setup (SLA)1
<b>Week 5</b>	Lab 5: Machine Setup (SLA)2

<b>Week 6</b>	Lab 6: Build
<b>Week 7</b>	Lab 7: Removal and Cleanup
<b>Week 8</b>	Lab 8: Post-Processing
<b>Week 9</b>	Lab9: Machine Setup (FDM)1
<b>Week 10</b>	Lab 10: Machine Setup (FDM)2
<b>Week 11</b>	Lab 11: Build
<b>Week 12</b>	Lab 12: Removal and Cleanup
<b>Week 13</b>	Lab 13: Post-Processing
<b>Week 14</b>	Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1. Additive Manufacturing Technologies 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing. Ian Gibson • David Rosen • Brent Stucker	No
<b>Recommended Texts</b>	2. ADDITIVE MANUFACTURING Edited by Amit Bandyopadhyay Susmita Bose.	No
<b>Recommended Texts</b>	3. Understanding Additive Manufacturing, Rapid Prototyping · Rapid Tooling · Rapid Manufacturing, Andreas Gebhardt	No

### Grading Scheme

#### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Biomaterials</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER220</b>		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr.Dunya Abdulsahib Hashim	e-mail	dunia.abdalsahip@nahrainuniv.edu.iq
Module Leader's Acad. Title	Ass.Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Professor.Dr.Mahmud Rasheed Ismail	e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Peer Reviewer Name			
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	bonimplant POER422	Semester	8
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 understand types of biomaterial in medical Sciences</li> <li>2. To identify the types of experimental</li> <li>3. To distinguish the general properties of different types of biomaterial</li> <li>4. To perform different test of biomaterial</li> <li>5. To learn the method of composit material ,properties and application</li> <li>6. To learn the mothd of manufacturing of different types of biomaterial</li> <li>7. To learnm the mothod of heat treatment .</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Introduction and general properties of biomaterial</li> <li>2. Synthetic Biomaterials</li> <li>3. Types of biomaterial</li> <li>4. Plastic Materials for External ,Internal Prosthesis and Orthoses</li> <li>5. Types testing of biomaterial</li> <li>6. Analysis of teasting</li> <li>7. Mechanisms of Corrosion</li> <li>8. elastic and plastic deformation</li> <li>9. Heat treatment methods</li> <li>10. Application biomaterial in himanbody</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Useful Definitions of Biomaterials and Requirements of Biomaterials [ 7 hrs]</p> <p>Properties of Biomaterials,Synthetic Biomaterials[8hrs]</p> <p>Where do the differences between (bio-)materials come from [8 hrs]</p> <p>types of biomaterial and method of manufacturing [7hrs]</p> <p>Relation between polarization ,resstance of polarization and biocompatboly [8 hrs]</p> <p>Heat trerment , Plastic Materials for External ,Internal Prosthesis [8 hrs]</p> <p>Corrosion and Biocompatibility of Orthopedic Implants [7 hrs]</p> <p>Mechanisms of Corrosion [7 hrs] ..</p>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	
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	The main strategy that will be adopted in delivering this module is to develop students in orthotics and prosthetic engineering field, application of different types of biomaterial .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and seminar s in class and homework ..
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3.8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 10
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Biomaterials (definitions, history, and importance )

<b>Week 2</b>	Requirements of Biomaterials
<b>Week 3</b>	Properties of Biomaterials
<b>Week 4</b>	Synthetic Biomaterials (first, second ,third and fourth generation) types and application
<b>Week 5</b>	Effect of bounding energy on the mechanical and physical properties (melting temperature, thermal expansion and elastic modules).
<b>Week 6</b>	Types of Biomaterials (Polymeric, Ceramic, Metallic, Composite),Smart metallic
<b>Week 7</b>	General properties, Manufacturing ,and application of (Polymeric, Ceramic, Metallic, Composite)
<b>Week 8</b>	Glass ceramic , General properties ,Manufacturing ,and application
<b>Week 9</b>	Carbon types(CNT,C Fibber) and applications
<b>Week 10</b>	Elastic and Plastic deformation, Plastic Materials application for External, Internal Prostheses and Orthoses,
<b>Week 11</b>	Testing Biomaterials (Biological, Microstructure ,Mechanical)
<b>Week 12</b>	Heat treatment (annealing, centering, milting .....
<b>Week 13</b>	Corrosion of metallic implants
<b>Week 14</b>	Mechanisms of Corrosion
<b>Week 15</b>	effect factors corrosion behavior of an implant
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

في حالة وجود مختبر ... توضع التجارب

	Material Covered
<b>Week 1</b>	1- surface modification of metal mechanical and chemical (grinding ,polishing,eaching )
<b>Week 2</b>	2-melting and mixing biomaterial powder +binder.(magnatic stilear )
<b>Week 3</b>	3-powder metallurgy.
<b>Week 4</b>	4-prepartion of biomaterial specimens.
<b>Week 5</b>	5-microstructure examination .(optical microscope)
<b>Week 6</b>	6-preparation of body solution.(magnatic stilear)
<b>Week 7</b>	7-corrosion. (corrosion strument)

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	Material science and engineering William D.callister 2012.	No
<b>Recommended Texts</b>	Biomaterials in Orthopedics Michael. Yaszemski ,Debra J. Trantolo 2014	No
<b>Websites</b>	<a href="https://www.biomaterial">https://www.biomaterial</a>	

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



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Biomechanics</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER221</b>		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Yasir Y. Kahtan	e-mail	yasir.yaarb@nahrainuniv.edu.iq
Module Leader's Acad. Title	Asst. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	Analytical Biomechanics (POER323)	Semester	6

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Describe the scope of scientific inquiry addressed by biomechanists.</li> <li>2. Understand and describe the reference positions, planes, and axes associated with the human body. Define and appropriately use directional terms and joint movement terminology.</li> <li>3. Explain how the material constituents and structural organization of bone affect its ability to withstand mechanical loads.</li> <li>4. This is the basic subject for all biomechanics courses.</li> <li>5. To analysis the forces and moments on the human extremity.</li> <li>6. Identify factors influencing the relative mobility and stability of different regions of the spine.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Recognize the kinematics concepts and reference geometry.</li> <li>2. List the various terms associated qualitative analysis.</li> <li>3. Identify the mechanical loads on human body.</li> <li>4. List and identify tools for measuring kinetics quantities.</li> <li>5. Describe bone stress theory and discuss bone types.</li> <li>6. Identify joint architecture, joint stability and flexibility.</li> <li>7. Recognize and analyze research papers regarding kinematics and kinetics of biomechanical quantities.</li> <li>8. Discuss the behavioral properties of the musculotendinous unit.</li> <li>9. Describe the center of mass and the body stability.</li> <li>10. Identify the loads on the upper extremity joints.</li> <li>11. Identify the loads on the lower extremity joints.</li> <li>12. Describe the consistent of the human spine and the loads.</li> <li>13. Discuss the hip, knee and ankle disarticulation biomechanics.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <p><u>Part A – General Biomechanics</u></p> <p>Introduction to biomechanics, the kinematic concepts for analyzing human motion and kinetic concepts for analyzing human motion. [8 hrs.]</p> <p>Biomechanics of human bone growth and development, this include bone tissue composition and structure. How bone respond to stress and some of the bone fracture. [4 hrs.]</p>

	<p>Biomechanics of human skeletal articulation. The joint architecture, stability and flexibility. [4 hrs.]</p> <p>The biomechanics of human skeletal muscles. The behavioral properties of the musclotendinous unit. Structural organization of skeletal unit. Skeletal muscle function. Factors affecting muscular generation. Muscular strength, power and endurance. [8 hrs.]</p>
	<p><u>Part B – Biomechanics of the extremity</u></p>
	<p>Biomechanics of the human upper extremity. Shoulder, elbow, wrist and the hand. [6 hrs.]</p>
	<p>Biomechanics of the human lower extremity. Hip, knee, ankle and the foot. [6 hrs.]</p>
	<p>Biomechanics of the human spine. Structure of the spine. Movement of the spine. Muscles and loads of the spine. [6 hrs.]</p>
	<p><u>Part C – Biomechanics of the amputee</u></p> <p>Biomechanics of the hip disarticulation, knee disarticulation and ankle prosthetic [6 hrs.]</p>

<p style="text-align: center;"><b>Learning and Teaching Strategies</b></p> <p style="text-align: center;">استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple assignment involving some sampling activities that are interesting to the students.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	3, 6, 9	LO # 1-8, 10,11
	Assignments	1	15% (15)	2, 12	LO # 3, 4, 6 and 7
	Report	1	15% (15)	13	LO # 9
Summative assessment	Midterm Exam	2 hr.	10% (10)	7	LO # 1-8
	Final Exam	3 hr.	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to Biomechanics + Kinematic Concepts for Analyzing Human Motion (Forms of motions, Standard Reference Terminology, Joint Movement Terminology)
<b>Week 2</b>	Kinematic Concepts for Analyzing Human Motion ( Spatial Reference Systems, Qualitative Analysis of the Human Movement, Tools for Measuring Kinematic Quantities) + Kinetic Concepts for Analyzing Human Motion (Basic Concepts Related to Kinetics, Mechanical Loads on the Human Body)
<b>Week 3</b>	Kinetic Concepts for Analyzing Human Motion (The Effects of Loading, Tools for Measuring Kinetic Quantities, Vector Algebra) + Class activity (Seminar in Kinematic and Kinetic Concept by Reviewing Published Papers)
<b>Week 4</b>	The Biomechanics of Human Bone Growth and Development
<b>Week 5</b>	The Biomechanics of Human Skeletal Articulations
<b>Week 6</b>	The Biomechanics of Human Skeletal Muscle (Behavioral Properties of the Musculotendinous Unit, Structural Organization of Skeletal Muscle) + The Biomechanics of Human Skeletal Muscle (Skeletal Muscle Function, Factors Affecting Muscular Force Generation)
<b>Week 7</b>	Mid-term Exam + The Biomechanics of Human Skeletal Muscle (Muscular Strength, Power, and Endurance)
<b>Week 8</b>	The Biomechanics of Human Upper Extremity (Shoulder + Elbow)
<b>Week 9</b>	The Biomechanics of Human Upper Extremity (Wrist + Hand) + The Biomechanics of Human Lower Extremity (Hip)
<b>Week 10</b>	The Biomechanics of Human Lower Extremity (Knee + Ankle)
<b>Week 11</b>	The Biomechanics of Human Spine (Part 1 + Part 2)
<b>Week 12</b>	The Biomechanics of Human (Part 3) + Stability Application
<b>Week 13</b>	Hip Disarticulation Biomechanics
<b>Week 14</b>	Knee Disarticulation Biomechanics
<b>Week 15</b>	Trans-tibial Prosthetic Biomechanics + Ankle Disarticulation Biomechanics
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Basic Biomechanics, 6 <sup>th</sup> edition, by Susan J. Hall, McGraw-Hill, 2012.	Yes
Recommended Texts	Fundamentals of Biomechanics, 2nd Edition, 2007 by Duane Knudson	No
Websites	<a href="https://youtube.com/@Anatomyzone">https://youtube.com/@Anatomyzone</a> <a href="https://youtube.com/playlist?list=PLS-ocxImwSG_VODKg-Ow12FsyGfDC9cnz">https://youtube.com/playlist?list=PLS-ocxImwSG_VODKg-Ow12FsyGfDC9cnz</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

**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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Bone Implant</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER422</b>		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr.Dunya Abdulsahib Hashim	e-mail	dunia.abdalsahip@nahrainuniv.edu.iq
Module Leader's Acad. Title	Ass.Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Professor.Dr.Mahmud Rasheed Ismail	e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	3.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	biomaterial POER220	Semester	4
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. This course provides an introductory overview of the various implant materials</li> <li>2. To identify the types of implant and design</li> <li>3. To distinguish between different material properties and application of implant</li> <li>4. To understand that medical implants (hip replacements, bone, or dental knee, scaffold ....) that is need to integrate with surrounding tissues .</li> <li>5. To learn the modern method of implant design and general properties.</li> <li>6. to indicate the biomaterial and applications in orthotics and prosthetic engineering field</li> <li>7. To understanding the parts and model of AK and OK implant prosthesis</li> <li>8. Understanding the basic of ossiontergration for implant</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. understanding the most important term in bone implant biomaterials</li> <li>2. Know the basics of implants</li> <li>3. Understand the components of each term of implant</li> <li>4. Biomaterial Tastings</li> <li>5. adhesion Implant and fixation Method</li> <li>6. modren technology of design joint implant</li> <li>7. scaffold , the material and application</li> <li>8. process of ossiointegration and implant</li> <li>9. differnt model of AK and OK implant prosthesis</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Basic concepts, types of biomaterial studies ,</p> <p>Applications of metallic, ceramic and polymer in Bone Implants[ with example for each types of [7 hrs]</p> <p>Types Total Joint Replacement (Hip ,knee) [7 hrs]</p> <p>Bone Screw Plates as material design , properties and application for each types ,Bone Scaffold Application ,Porous and the important for adhesion of implant[9], Biomedical Testing for Joints Applications of 3D Printing of Ceramic In Plant, Prosthesis Implant Technology[8 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>The main strategy that will be adopted in delivering this module is to develop students in orthotics and prosthetic engineering field, application of different types</p>
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	of biomaterial and application in bone implant .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and seminar s in class and homework .
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	44	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2.9
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.0
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 7
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction and Basic Concept
<b>Week 2</b>	Applications of Bio- ceramic in Bone Implants

<b>Week 3</b>	Applications of Bio- metallic in Bone Implants
<b>Week 4</b>	Total Joint Replacement (Hip ,knee)
<b>Week 5</b>	Bone Screw Plates
<b>Week 6</b>	Orthopedic Implant
<b>Week 7</b>	Rib Cage
<b>Week 8</b>	Bone Scaffold Application
<b>Week 9</b>	Porous Ortho Implants
<b>Week 10</b>	Biomedical Testing for Joints
<b>Week 11</b>	Biomedical Testing for Spine and Vertebra
<b>Week 12</b>	Applications of 3D Printing of Ceramic In Plant
<b>Week 13</b>	Prosthesis Implant Technology
<b>Week 14</b>	Types of adhesions
<b>Week 15</b>	Reporting
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	An Introduction Tissue Biomaterial Interaction ,Kay C.Deer & David A,2002.	No

<b>Recommended Texts</b>	Bio-Implant Interface Improvement Biomaterial and Tissue Reaction ,Jan Erik E & S .Pretter L.2003	No
<b>Websites</b>	<a href="https://www.Bone implant">https://www.Bone implant</a>	

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	CAD/CAM System		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER314		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	
Administering Department	09	College	03
Module Leader	Ahmed Abdulsameea Alduroobi	e-mail	ahmed.alduroobi@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Scientific committee	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To develop problem-solving skills by identifying the mathematical description of geometric profile.</li><li>2. To learn how to programmatically represent geometric shapes based on mathematical equations.</li><li>3. Identify the methods used in determining the modeling of geometric shapes.</li><li>4. Identify the mechanisms used in reverse engineering to describe geometric shapes.</li><li>5. Learn about automated manufacturing mechanisms.</li><li>6. Determine the best path for calculating manufacturing operations</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Representation of geometric shapes based on parametric and non-parametric equations.</li><li>2. Learn the Bezier method for representing curves.</li><li>3. Learn the mathematical method for achieving continuity for complex curves.</li><li>4. Learn about transformation matrices like rotation matrix, reflection matrix.....etc.</li><li>5. Learn about interpolation methods</li><li>6. Learn the mechanics of reverse engineering.</li><li>7. Learn how to develop automated manufacturing software.</li><li>8. Learn how to determine the tool path generation.</li><li>9. Learn about the mechanics of transferring files from CAD to CAM without any distortion.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A – CAD system</u></p> <p>At this stage, students will learn how to represent regular and complex geometric shapes based on different representation methods.</p> <p>At this stage, the method of creating complex shapes will be determined by knowing some points.</p> <p><u>Part B – Reverse engineering</u></p> <p>At this point, complex shapes will be represented through the use of reverse engineering techniques.</p> <p><u>Part C – CAM system</u></p> <p>At this stage, students will learn how to perform manufacturing processes for designed shapes.</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The strategy for this course is to teach students how to design and automate manufacturing based on mathematical equations to describe programmed manufacturing architecture and mechanisms. In addition to encouraging students to innovate and develop new ideas or modify previous ideas in their field of specialization, in order to learn about modern technologies for design and manufacturing processes.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## 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, 2, 10 and 11
	<b>Assignments</b>	4	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	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

	Material Covered
<b>Week 1</b>	Computer graphics Geometric modeling Non-parametric and parametric curve and surface representation.
<b>Week 2</b>	(Bezier Techniques).
<b>Week 3</b>	Continuity (G and C continuity).
<b>Week 4</b>	Transformation matrices: Translation. Reflection
<b>Week 5</b>	Scaling. Rotation.
<b>Week 6</b>	Approximation and Interpolation: Linear
<b>Week 7</b>	Circular
<b>Week 8</b>	Reverse engineering1
<b>Week 9</b>	Reverse engineering2
<b>Week 10</b>	Mid Exam.
<b>Week 11</b>	Part programming: Introduction, Preparatory function, feed rate function.
<b>Week 12</b>	G-code functions, miscellaneous function M, spindle speed function, tool change function.
<b>Week 13</b>	Tool path generation: Types of cutters geometries that commonly used.
<b>Week 14</b>	Definition the equation of tool path generation+ Write a G-code using program language.
<b>Week 15</b>	CAD to CAM transformations and simulation for roughing, finishing operations.
<b>Week 16</b>	<b>Final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Plotting in 2D using MATLAB
<b>Week 2</b>	Lab 2: Plotting in 2D using MATLAB
<b>Week 3</b>	Lab 3: Plotting in 3D using MATLAB



<b>Week 4</b>	Lab 4: Plotting in 3D using MATLAB
<b>Week 5</b>	Lab 5: Transformation matrices using MATLAB
<b>Week 6</b>	Lab 6: Transformation matrices using MATLAB
<b>Week 7</b>	Lab 7: Transformation matrices using MATLAB
<b>Week 8</b>	Lab 8: laser scanning
<b>Week 9</b>	Lab 9: laser scanning
<b>Week 10</b>	Lab 10: laser scanning
<b>Week 11</b>	Lab 11: CAM system
<b>Week 12</b>	Lab 12: CAM system
<b>Week 13</b>	Lab 13: CAM system
<b>Week 14</b>	Lab 14: Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1. COMPUTER AIDED MANUFACTURING BY P N RAO, N K TEWARI, T K KUNDRA, INDIAN.	No
<b>Recommended Texts</b>	2. COMPUTER AIDED AIDED/ COMPUTER AIDED MANUFACTURING BY VIKRAM SHARMA.	No
<b>Recommended Texts</b>	3. GEOMETRIC MODELING / BY G.GREINER.	No

### Grading Scheme

#### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Application		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER324		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3 3	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Yassr Y. Kahtan	e-mail	yasir.yaarb@nahrainuniv.edu.iq
Module Leader's Acad. Title	Asst. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Drawing II (CREQ120)	Semester	2
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 sketches, drawing, mates and simulations.</li><li>2. To understand part, drawing and assembly from real cases using SOLIDWORKS.</li><li>3. This course deals with the basic concept of SOLIDWORKS and simulation.</li><li>4. This is the basic subject for standard assembly mates.</li><li>5. To understand spline and complex geometries in SOLIDWORKS.</li><li>6. To perform mesh and numerical simulation.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize how drawing and dimensions are generated.</li><li>2. Define sketches, features, and evaluate section</li><li>3. List the various standard mates available for assembly.</li><li>4. Discuss assemblies and modify according to need.</li><li>5. Construct a surface for complex geometries.</li><li>6. Construct geometries from non-value shapes.</li><li>7. Define finite element method.</li><li>8. Identify the basic steps in static simulation.</li><li>9. Explain the boundary conditions for various cases.</li><li>10. Identify the basic steps in steady state thermal simulation.</li><li>11. Explain verification, validation and mesh analysis.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A – Material and Assembly</u></p> <p>In this topic, we will cover how to assign materials to your models and evaluate mass properties for existing 3D models. This will include finding the mass and the volume of a 3D model. We will also cover how to introduce a new coordinate system to our model. [2 hrs.]</p> <p>The use SOLIDWORKS assemblies, allow us to mix multiple parts together to create a single artifact. In this topic, we will cover basic SOLIDWORKS assemblies, and in particular, standard mates. [12 hrs.]</p>

	<p><u>Part B – Surfaces and Spline</u></p> <p>Working with surface is more complex than working with solid bodies. This requires understanding surface tools that is similar to solid, surface editing tools. Spline is important tools dealing with non-value shapes. [14 hrs.]</p> <p><u>Part C – Finite Element Method</u></p> <p>A finite element analysis is a complex process that approximates a physical phenomenon. An analysis can take in consideration many different physical conditions like force, pressure, temperature, heat and vibration. Based on the analysis results, changes can be made to the original design's geometry and/or material to improve part's performance. [14 hrs.]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of software application involving some sampling activities that are interesting to the students.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.14
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Class works	7	15% (15)	Continuous	All
	Home works	10	10% (10)	Continuous	All
	Projects / Lab.	1	15% (15)	15	LO # 7-11
Summative assessment	Midterm Exam	2 hr.	10% (10)	7	LO # 1-5
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to SOLIDWORKS + Review part and drawing details.
Week 2	Reference geometry, materials and mass properties.
Week 3	Assembly and standard assembly mates.
Week 4	Assembly and value oriented standard assembly mates.
Week 5	Surfaces
Week 6	Surfaces
Week 7	Mid-term Exam
Week 8	Spline.
Week 9	Equations, configuration and design tables.
Week 10	Introduction to finite element method
Week 11	Static stress simulation part 1
Week 12	Static stress simulation part 2
Week 13	Thermal analysis part 1
Week 14	Thermal analysis part 2
Week 15	Review + extra tutorial
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction part and drawing files.
Week 2	Lab 2: Assign material and appearance.
Week 3	Lab 3: Assembly and applying non-value oriented standard mates.
Week 4	Lab 4: Surface tutorial
Week 5	Lab 5: Spline tutorial
Week 6	Lab 6: Design table tutorial
Week 7	Lab 7: Static stress analysis
Week 8	Lab 8: Thermal analysis simulation

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Learn SOLIDWORKS 2020, by Tayseer Almattar, Packt Publishing, 2019	Yes
Recommended Texts	SOLIDWORKS Surfacing and Complex Shape Modeling Bible, by Matt Lombard, Wiley Publishing, Inc., 2008.	No
Websites	<a href="https://youtube.com/@ANSOL">https://youtube.com/@ANSOL</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

**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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Math III</b>		Module Delivery
Module Type	<b>Core</b>		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>MATH210</b>		
ECTS Credits	<b>5</b>		
SWL (hr/sem)	<b>125</b>		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Haidar Moafaq Taofeeq	e-mail	Haidar.taofeeq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Associate Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Associate Prof. Ammar Esam	e-mail	E-mail: ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH II	Semester	2
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 different types of differential equations.</li> <li>2. To understand the different types of First order ordinary differential equations.</li> <li>3. To explain and solve the Second Order Linear ordinary differential equations.</li> <li>4. This course deals with the basic concept of Laplace transform.</li> <li>5. To clarify the important Laplace transform, Laplace inverse, and solve ordinary differential equations using Laplace transforms.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Define the differential equations and their types.</li> <li>2. Understanding the initial and boundary value problems.</li> <li>3. Identify the first order ordinary differential equations and their types.</li> <li>4. Explaining the Second Order Linear ordinary differential equations and their types (Homogenous types).</li> <li>5. Understanding the Second Order Linear ordinary differential equations and their types (non-Homogenous types).</li> <li>6. Discuss the basic approach of Laplace transform.</li> <li>7. Understanding the Inverse of Laplace transforms and their methods of solution.</li> <li>8. Explain the solving of ordinary differential equations using Laplace Transform.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Differential Equation (Definition, Concepts, and Types) [3 hrs]  Initial and Boundary Value Problems [3 hrs]  First order ordinary differential equations [3 hrs]  Separable of Variables Equations [3 hrs]  Homogenous Equations [4 hrs]  Exact Equations &amp; non- Exact Equations [5 hrs]  Ordinary Differential Equations with linear coefficients [4 hrs]  Linear Equations [4 hrs]  Second Order Linear ODEs (Homogenous Linear ODEs of Second Order) [3 hrs]  Second Order Linear ODEs (Homogenous Linear ODEs) [3 hrs]  Second Order Linear ODEs (Non-Homogenous Linear ODEs) [4 hrs]  Mid-term exam  Laplace Transforms of Equation [4 hrs]  Inverse of Laplace Transforms [4 hrs]  Solve ODEs using Laplace Transforms [3 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<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>	10	10% (10)	Continuous	All
	<b>Assignments</b>	5	10% (10)	Continuous	All
	<b>Projects</b>	1	10% (10)	Continuous	All
	<b>Report</b>	-	-	-	-
<b>Summative</b>	<b>Midterm Exam</b>	2 hr	20% (20)	10	LO # 1-11

assessment	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Differential Equation (Definition, Concepts, and Types)
Week 2	Initial and Boundary Value Problems
Week 3	First order ordinary differential equations
Week 4	Separable of Variables Equations
Week 5	Homogenous Equations
Week 6	Exact Equations & non- Exact Equations
Week 7	Ordinary Differential Equations with linear coefficients
Week 8	Linear Equations
Week 9	Second Order Linear ODEs (Homogenous Linear ODEs of Second Order)
Week 10	Second Order Linear ODEs (Homogenous Linear ODEs)
Week 11	Second Order Linear ODEs (Non-Homogenous Linear ODEs)
Week 12	Mid-term exam
Week 13	Laplace Transforms of Equation
Week 14	Inverse of Laplace Transforms
Week 15	Solve ODEs using Laplace Transforms
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	

Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Advance Engineering Mathematics, Erwin Kreyszig, 10th ed., John Wiley & Sons, Inc., 2011.	Yes
Recommended Texts	Advance Engineering Mathematics, Erwin Kreyszig, 10th ed., John Wiley & Sons, Inc., 2011.	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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Math II</b>		Module Delivery
Module Type	<b>Core</b>		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>MATH120</b>		
ECTS Credits	<b>6</b>		
SWL (hr/sem)	<b>150</b>		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Haidar Moafaq Taofeeq	e-mail	Haidar.taofeeq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Associate Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Associate Prof. Ammar Esam	e-mail	E-mail: ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH I	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of different types of unlimited integrals.</li><li>2. To understand the difference between the different types of functions such as logarithms, exponential, inverse functions, and hyperbolic.</li><li>3. Use the other types of integral's concepts to understand the behavior of function in form of function integrations.</li><li>4. This course deals with the basic concept of integrations and a brief introduction to matrices.</li><li>5. To clarify the important types of integrals such integration by parts, partial fractions integrals, and numerical integrals.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Define the inverse function and its derivative.</li><li>2. Understanding the natural logarithms and exponential.</li><li>3. Identify the inverse of trigonometric functions and hyperbolic functions.</li><li>4. Discuss the integration by parts.</li><li>5. Explaining the meaning of trigonometric integrals and trigonometric substitutions.</li><li>6. Understanding the integration of Rational Functions by Partial Fractions.</li><li>7. Discuss the basic approach of numerical integrals.</li><li>8. understanding the different types of matrices and matrix algebra.</li><li>9. Explain the applications matrix determinants and solving set of equations.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Inverse Functions and Their Derivatives [4 hrs] Natural Logarithms [4 hrs] Exponential Functions [4 hrs] Inverse Trigonometric Functions [5 hrs] Hyperbolic Functions [5 hrs] Integration by Parts [4 hrs] Trigonometric Integrals [5 hrs] Trigonometric Substitutions [5 hrs] Integration of Rational Functions by Partial Fractions [4 hrs] Mid Term Exam Numerical Integration [4 hrs] Introduction to Matrix [4 hrs] Matrix Algebra [4 hrs] Finding the Determinants [4 hrs] Finding the Matrix Inverse and Solving Set of Equations [4 hrs]

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	8	10% (10)	Continuous	All
	<b>Assignments</b>	5	10% (10)	Continuous	All
	<b>Projects</b>	1	10% (10)	Continuous	All
	<b>Report</b>	-	-	-	-
<b>Summative</b>	<b>Midterm Exam</b>	2 hr	20% (20)	10	LO # 1-9



assessment	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Inverse Functions and Their Derivatives
Week 2	Natural Logarithms
Week 3	Exponential Functions
Week 4	Inverse Trigonometric Functions
Week 5	Hyperbolic Functions
Week 6	Integration by Parts
Week 7	Trigonometric Integrals
Week 8	Trigonometric Substitutions
Week 9	Integration of Rational Functions by Partial Fractions
Week 10	Mid Term Exam
Week 11	Numerical Integration
Week 12	Introduction to Matrix
Week 13	Matrix Algebra
Week 14	Finding the Determinants
Week 15	Finding the Matrix Inverse and Solving Set of Equations
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	

Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas' Calculus I Maurice D. Weir, Joel Hass, George B. Thomas.-12th Ed.	Yes
Recommended Texts	Thomas' Calculus I Maurice D. Weir, Joel Hass, George B. Thomas.-12th Ed.	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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Math I</b>		Module Delivery
Module Type	<b>Core</b>		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>MATH110</b>		
ECTS Credits	<b>6</b>		
SWL (hr/sem)	<b>150</b>		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Haidar Moafaq Taofeeq	e-mail	Haidar.taofeeq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Associate Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Associate Prof. Ammar Esam	e-mail	E-mail: ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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 derivatives and integrals.</li> <li>2. To understand the difference between the different types of functions.</li> <li>3. Use the derivative concepts to understand the behavior of function in form of function sketching.</li> <li>4. This course deals with the basic concept of functions, limits, continuity, derivations, and integrations.</li> <li>5. To clarify the applications of both of derivative and integrals.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Define the function and trigonometric functions.</li> <li>2. Understanding the definition of limits, continuity and how to deals with different functions.</li> <li>3. Identify the basic of derivative.</li> <li>4. Discuss the different meaning of derivatives.</li> <li>5. Explaining the types, degree, and rules of derivatives.</li> <li>6. Understanding the applications of derivatives.</li> <li>7. Identify the basic circuit elements and their applications.</li> <li>8. Discuss the basic approach of integrals.</li> <li>9. understanding the different types of integrals and their applications.</li> <li>10. Explain the applications of integration and how to calculate the ach length.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Introduction to Function, Trigonometric Functions [5 hrs] Limits and Continuity [5 hrs] Rates of Change and Tangents to Curves, Limit of a Function and Limit Laws, One-Sided Limits [5 hrs] Continuity, Limits Involving Infinity; Asymptotes of Graphs [6 hrs] Differentiation, Tangents and the Derivative at a Point, The Derivative as a Function Differentiation Rules, The Derivative as a Rate of Change, Derivatives of Trigonometric Functions [6 hrs] The Chain Rule, Implicit Differentiation, Related Rates, Linearization Applications of Derivatives, Extreme Values of Functions, Monotonic Functions and the First Derivative Test [6 hrs] Concavity and Curve Sketching [5 hrs] Mid Term Exam I Integration, Area and Estimating with Finite Sums, Sigma Notation and Limits of Finite Sums [5 hrs] The Definite Integral, The Fundamental Theorem of Calculus [5 hrs] Applications of Definite Integrals, Volumes Using Cross-Sections [5 hrs] Arc Length [5 hrs] Areas of Surfaces of Revolution [5 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	8	10% (10)	Continuous	All
	<b>Assignments</b>	5	10% (10)	Continuous	All
	<b>Projects</b>	1	10% (10)	Continuous	All
	<b>Report</b>	-	-	-	-
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	10	LO # 1-9
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Function, Trigonometric Functions
Week 2	Limits and Continuity
Week 3	Rates of Change and Tangents to Curves, Limit of a Function and Limit Laws, One-Sided Limits
Week 4	Continuity, Limits Involving Infinity; Asymptotes of Graphs
Week 5	Differentiation, Tangents and the Derivative at a Point, The Derivative as a Function
Week 6	Differentiation Rules, The Derivative as a Rate of Change, Derivatives of Trigonometric Functions
Week 7	The Chain Rule, Implicit Differentiation, Related Rates, Linearization.
Week 8	Applications of Derivatives, Extreme Values of Functions, Monotonic Functions and the First Derivative Test
Week 9	Concavity and Curve Sketching
Week 10	Mid Term Exam I
Week 11	Integration, Area and Estimating with Finite Sums, Sigma Notation and Limits of Finite Sums
Week 12	The Definite Integral, The Fundamental Theorem of Calculus
Week 13	Applications of Definite Integrals, Volumes Using Cross-Sections
Week 14	Arc Length
Week 15	Areas of Surfaces of Revolution
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

Week 7	
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas' Calculus I Maurice D. Weir, Joel Hass, George B. Thomas.-12th Ed.	Yes
Recommended Texts	Thomas' Calculus I Maurice D. Weir, Joel Hass, George B. Thomas.-12th Ed.	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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<b>MATH IV</b>		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	<b>MATH220</b>			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		4
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Haidar Moafaq Taofeeq		e-mail	Haidar.taofeeq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Associate Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Associate Prof. Ammar Esam		e-mail	E-mail: ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH III	Semester	3
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of Matrices.</li><li>2. To understand the determinants, adjoint, transpose, and inverse of matrix.</li><li>3. To explain and solve the set of linear equations using matrix.</li><li>4. This course deals with the basic concept of complex numbers.</li><li>5. To clarify the important vector analysis and vector operations.</li><li>6. Explain the Fourier series of function.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Define the matrices and their determinants, adjoint, transpose, and inverse.</li><li>2. Understanding the Eigen Values and Eigen Vectors.</li><li>3. Explaining the Solution of set of linear equations using matrices.</li><li>4. Understanding the basic concept of complex numbers.</li><li>5. Discuss the complex numbers' operations, complex numbers' logarithm and exponential.</li><li>6. Understanding the Inverse of Laplace transforms and their methods of solution.</li><li>7. Explain the Cauchy-Riemann's Equation in for complex numbers.</li><li>8. Understanding the basic concept of vectors analysis.</li><li>9. Identify the vector, scalar, and planes.</li><li>10. Explaining the Fourier series of function.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Matrices and Determinants [4 hrs] Adjoint and Transpose of matrix [4 hrs] Inverse of matrix [4 hrs] Eigen Values & Eigen Vectors [5 hrs] Solution of set of linear equations [5 hrs] Complex Numbers [4 hrs] Complex Numbers Operations [4 hrs] Cauchy-Riemann's Equation [5 hrs] Vector Analysis [4 hrs] Vectors, Scalars, and Planes [4 hrs] Vectors Operations [5 hrs] Fourier Series [5 hrs]

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	10	10% (10)	Continuous	All
	<b>Assignments</b>	5	10% (10)	Continuous	All
	<b>Projects</b>	1	10% (10)	Continuous	All
	<b>Report</b>	-	-	-	-
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	10	LO # 1-10
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Matrices and Determinants
Week 2	Adjoint and Transpose of matrix
Week 3	Inverse of matrix
Week 4	Eigen Values & Eigen Vectors
Week 5	Eigen Values & Eigen Vectors
Week 6	Solution of set of linear equations
Week 7	Solution of set of linear equations
Week 8	Complex Numbers
Week 9	Complex Numbers Operations
Week 10	Cauchy-Riemann's Equation
Week 11	Mid-Term Exam
Week 12	Vector Analysis
Week 13	Vectors, Scalars, and Planes
Week 14	Vectors Operations
Week 15	Fourier Series
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Advance Engineering Mathematics, Erwin Kreyszig, 10th ed., John Wiley & Sons, Inc., 2011.	Yes
Recommended Texts	Advance Engineering Mathematics, Erwin Kreyszig, 10th ed., John Wiley & Sons, Inc., 2011.	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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Mechanical Design</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory
Module Code	<b>POER411</b>		<input checked="" type="checkbox"/> Lecture
ECTS Credits	6		<input checked="" type="checkbox"/> Lab
SWL (hr./sem)	150		<input checked="" type="checkbox"/> Tutorial
			<input type="checkbox"/> Practical
			<input type="checkbox"/> Seminar
Module Level	4	Semester of Delivery	7
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Yasir Y. Kahtan	e-mail	yasir.yaarb@nahrainuniv.edu.iq
Module Leader's Acad. Title	Asst. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Strength of Materials (POER211)	Semester	3
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 designing parts regarding static and dynamic loading.</li><li>2. To understand fatigue, screw, and springs from design point of view.</li><li>3. This course deals with the basic concept of mechanical part design and prosthetic design.</li><li>4. This is the basic subject for all prosthetics engineers.</li><li>5. To analysis and simulation different cases using specialized finite element packages.</li><li>6. To perform mesh and static, dynamic, and thermal analysis.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize how fatigue affect the life of mechanical parts.</li><li>2. List the various terms associated with fatigue, screw, and springs.</li><li>3. Summarize what is meant by a combined loading design.</li><li>4. Discuss the theories of fatigue.</li><li>5. Describe factor of safety theoretically and numerically.</li><li>6. Define finite element method.</li><li>7. Identify the basic steps in finite element analysis.</li><li>8. Discuss the application of boundary conditions.</li><li>9. Discuss the mesh analysis.</li><li>10. Identify the design of active above knee prosthesis.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A – Fatigue, Screws , and Springs</u> Variable stresses in machine parts + pressure vessels + screwed joints + springs [20 hrs.]</p> <p><u>Part B – Finite Element Method</u> Fundamentals of finite element method and application to Ansys. [20 hrs.]</p> <p><u>Part C – Prosthesis Design</u> Design of active above knee prosthesis. [10 hrs.]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	100	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	Quizzes	2	15% (15)	5, 10	LO # 3 and 4
	Projects / Lab.	7	10% (10)	Continuous	LO # 6-9
	Report	1	15% (15)	13	LO # 10
<b>Summative assessment</b>	Midterm Exam	2 hr.	10% (10)	7	LO # 1-5
	Final Exam	3 hr.	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Variable stresses – introduction and type of cyclic stresses.
<b>Week 2</b>	Variable stresses – endurance limit factors, factor of safety, stress concentration.
<b>Week 3</b>	Variable stresses – Combined steady variable stress.
<b>Week 4</b>	Pressure Vessels – stresses in thin cylinder and sphere.
<b>Week 5</b>	Bolts – Introduction, types of screwing joints + Designation and standard dimensions.
<b>Week 6</b>	Bolts - Stresses in Screwed Fastening due to Static Loading + Design of Cylinder Covers.
<b>Week 7</b>	Mid-term Exam + Bolted Joints under Eccentric Loading.
<b>Week 8</b>	Spring - Types of Springs + Terms used in Compression Springs + Stresses in Helical Springs of Circular Wire + Deflection of Helical Springs of Circular Wire.
<b>Week 9</b>	Spring- Surge in Springs + Energy Stored in Helical Springs of Circular Wire + Helical Springs Subjected to Fatigue Loading + Helical Torsion Springs.
<b>Week 10</b>	Design of Active Above-Knee Prosthesis, parameter definition – general.
<b>Week 11</b>	Anthropological measures of the human population.
<b>Week 12</b>	Calculating the mass of the human body segments.
<b>Week 13</b>	Determination of the knee and ankle joint coordinates for the assumed starting position (maximum momentum, i.e. force).
<b>Week 14</b>	Calculating actuator torques in the joints of the locomotor system as well as the total moment in the knee joint when climbing the step.
<b>Week 15</b>	Determination of force, pressure and flow in a linear actuator.
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Static Structural Analysis – Part 1
<b>Week 2</b>	Lab 2: Static Structural Analysis – Part 2
<b>Week 3</b>	Lab 3: Fatigue Structural Analysis – Part 1
<b>Week 4</b>	Lab 4: Fatigue Structural Analysis- Part 2
<b>Week 5</b>	Lab 5: Modal and Harmonic Analysis



<b>Week 6</b>	Lab 6: Steady State Thermal Analysis
<b>Week 7</b>	Lab 7: Shape Optimization

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Machine design, (SI. units), 14 <sup>th</sup> Edition, 2005, by R.S. Khurmi and J.K. Gupta.	Yes
<b>Recommended Texts</b>	Active Above Knee Prosthesis A Guide to a Smart Prosthetic Leg by ZLATA JELAČIĆ, REMZO DEDIĆ and HARIS DINDO, 2020, Academic Press, Elsevier.	No
<b>Websites</b>	<a href="https://youtube.com/@ANSOL">https://youtube.com/@ANSOL</a>	

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Ocular prosthesis and implants</b>		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER422		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGV	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Muna Mustafa Kareem	e-mail	Muna.kareem@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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. Gain a deep understanding of the anatomy and physiology of the eye, including the structure and function of ocular tissues, muscles, and nerves. This knowledge is essential for designing and fitting ocular prostheses and implants.</li><li>2. Learn about the fabrication and fitting of ocular prostheses. This includes techniques for taking accurate measurements, creating customized prostheses, and achieving a natural appearance.</li><li>3. Identify the different types of ocular implants used in ophthalmic surgery.</li><li>4. Learn how to conduct thorough assessments of patients who require ocular prostheses or implants. They gain skills in evaluating ocular health, visual acuity, and cosmetic needs. They also learn techniques for assisting patients with the rehabilitation process, including ocular hygiene and maintenance.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Develop a thorough understanding of ocular anatomy and physiology.</li><li>2. Master techniques for fabricating and fitting ocular prostheses.</li><li>3. Gain proficiency in ocular implantation procedures.</li><li>4. Enhance assessment and evaluation skills for patients requiring ocular interventions.</li><li>5. Understand biocompatibility considerations and material selection for ocular prostheses and implants.</li><li>6. Foster effective communication and collaboration with healthcare professionals in multidisciplinary teams.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Anatomy of the face (4hrs) Causes of the eye and facial damage (2hrs) Orbital Implants (2hrs) Ocular prosthesis (2hrs) Materials Used for Ocular Prosthesis (2hrs) Developing the ocular model (2hrs) Creating wax model for the socket and iris placement (2hrs) Insertion of ocular prosthesis and follow up (2hrs) Orbital prosthesis (2hrs) Implants in ophthalmology (4hrs) Seminars (2hrs)</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, and seminars.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	44	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2.9
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	4	30% (10)	3, 5, 7, 10	LO #1-6
	<b>Assignments</b>	1	5% (10)	9	LO # 3
	<b>Projects / Lab.</b>	0	0% (0)		
	<b>Report</b>	0	0% (0)		
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	15% (10)	7,14	LO # 1-6
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Anatomy of the face
<b>Week 2</b>	Anatomy of the face
<b>Week 3</b>	Causes of the eye and facial damage
<b>Week 4</b>	Orbital Implants
<b>Week 5</b>	Ocular Prosthesis

Week 6	Materials Used for Ocular Prosthesis
Week 7	Mid-term Exam 1
Week 8	Developing the ocular model
Week 9	Creating wax model for the socket and iris placement
Week 10	Insertion of ocular prosthesis and follow up
Week 11	Orbital prosthesis
Week 12	Implants in ophthalmology
Week 13	Implants in ophthalmology
Week 14	Mid-term Exam 2
Week 15	Seminars
Week 16	Final Exam

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lectures	No
Recommended Texts		
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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Nanotechnology		Module Delivery
Module Type	Core learning activity		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER413		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr.Dunya Abdulsahib Hashim	e-mail	dunia.abdalsahip@nahrainuniv.edu.iq
Module Leader's Acad. Title	Ass.Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Professor.Dr.Mahmud Rasheed Ismail	e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	5.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	biomaterial POER220	Semester	4
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 understand introduction and size of nanotechnology</li> <li>2. To identify the properties of nanotechnology</li> <li>3. To distinguish and analysis the topography , morphology of surface material by a. Electron specimen interaction with material</li> <li>4. To analysis phase and roughness of surface material</li> <li>5. To learn the application of nanotechnology</li> <li>6. To learn the modern method manufacturing of nanotechnology.</li> <li>7. to indicate the biomaterial with nanosize applications in orthotics and prosthetic engineering field</li> <li>8. Quantum physics</li> <li>9. The most devices deals with Nano technology</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. identify the properties of nanotechnology</li> <li>2. the effects of nano size material on general properties of material</li> <li>3. Ability to identify crucial problem areas in manufacture and applications in orthotics and prosthetics</li> <li>4. learn the modern method Manufacturing and Synthesis of nanomaterial's.</li> <li>5. Advantage and disadvantage each technical manufacturing of nanomaterial</li> <li>6. The general Application of nanotechnology.</li> <li>7. The Application of nanotechnology in human body .</li> <li>8. Learn The analysis method of surface material by using modern devices system.</li> <li>9. Understanding the basic of quantum physics.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Introduction to the Nanotechnology and Effect of nano scale on the GENERAL properties of material ,[7 hrs], modern devices system deals with nano materials[8hrs].</p> <p>,methods analysis of surface material with different technical [6 hrs]</p> <p>Application nano materials in human body , in prosthesis and in orthoses [8hrs], Manufacturing and Synthesis of nanomaterial's [8 hrs] .. The Application of nano nanotechnology environment and Quantum physics [8 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	
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	The main strategy that will be adopted in delivering this module is to develop students in orthotics and prosthetic engineering field, application of different types of nanotechnology .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and seminars in class and homework .
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<b>Student Workload (SWL)</b>			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	44	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2.9
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.0
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

<b>Module Evaluation</b>					طرق التقييم وعلاقتها بتحقيق الاهداف
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 7
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>		مفردات المنهج المحدثة من لجنة تطوير المناهج
المناهج الاسبوعي النظري		
	<b>Material Covered</b>	
<b>Week 1</b>	Nanotechnology (introduction , definition and Structure )	

<b>Week 2</b>	Basics and important of Nanotechnology
<b>Week 3</b>	Factors cause the properties of nanoparticles
<b>Week 4</b>	Manufacturing of nanomaterial's
<b>Week 5</b>	The properties of materials that change with change to nano scale
<b>Week 6</b>	Types of Electron specimen interaction with material
<b>Week 7</b>	Instruments use to analysis of(nano- )materials
<b>Week 8</b>	X-ray Diffraction(XRD) Bragg's law , Spectroscopy FTIR,RAMAN
<b>Week 9</b>	Optical microscopy(OPT).San Electron Microscopy (SEM,) and Energy Dispersive X-ray Spectroscopy (EDS)
<b>Week 10</b>	Transmission Electron Microscope (TEM), Scanning Transmission Electron Microscope (STEM)
<b>Week 11</b>	Atomic force microscopy (AFM))
<b>Week 12</b>	Application of Nanotechnology:( drug delivery, damage the cancer cell, cleaning the ground water.)
<b>Week 13</b>	Application of Nanotechnology in Implants the Prostheses facial Nerves Move Biological Muscle,
<b>Week 14</b>	A brief intro to quantum physics
<b>Week 15</b>	Reporting
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	في حالة وجود مختبر ... توضع التجارب
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	Nanotechnology and materials technology KHIRAO,2011	No
<b>Recommended Texts</b>	BIOMEDICAL APPLICATIONS OF NANOTECHNOLOGY Vinod Labhasetwar,2017 by John Wiley & Sons, Inc. All rights reserved	No
<b>Websites</b>	<a href="https://www.nanotechnology">https://www.nanotechnology</a>	

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	NUMERICAL ANALYSIS		Module Delivery
Module Type	Core		<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	POER322		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Haidar Moafaq Taofeeq	e-mail	Haidar.taofeeq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Associate Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Associate Prof. Ammar Esam	e-mail	E-mail: ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH II	Semester	2
Co-requisites module	MATH IV	Semester	4

## 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 Taylor series.</li> <li>2. To understand the different types of numerical differentiation.</li> <li>3. To explain and solve the roots of equation and numerical integration.</li> <li>4. This course deals with the basic concept of solving set of linear and non-linear system of equations.</li> <li>5. To clarify, the least square curve fitting.</li> <li>6. Explain the interpolation and its methods.</li> <li>7. To explain and solve the Numerical solution of first order ordinary differential equation.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Define the Absolute error &amp; relative error calculations.</li> <li>2. Understanding the Taylor series.</li> <li>3. Explaining the Solution of a set of linear and non-linear equations.</li> <li>4. Understanding the basic concept of differentiation and its types.</li> <li>5. Discuss and find the roots of equations using different methods.</li> <li>6. Understanding the different types of numerical integrations.</li> <li>7. Explain the mechanism of Least square curve fitting.</li> <li>8. Understanding the basic concept of interpolation.</li> <li>9. Explaining the Numerical solution of first order ordinary differential equation.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Absolute error &amp; relative error calculations. [4 hrs]  Taylor series [4 hrs]  Numerical Differentiation- Forward differentiation [4 hrs]  Numerical Differentiation- Backward differentiation [4 hrs]  Numerical Differentiation- Central differentiation [4 hrs]  Roots of equations [5 hrs]  Numerical integration [5 hrs]  Review of basic matrix terminology and operation [2 hrs]  Systems of linear algebraic equation [4 hrs]  Systems of non-linear algebraic equation [5 hrs]  Least square curve fitting [5 hrs]  Interpolation [5 hrs]  Numerical solution of differential equation [5 hrs]  Numerical solution of differential equation [5 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<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>	10	10% (10)	Continuous	All
	<b>Assignments</b>	5	10% (10)	Continuous	All
	<b>Projects</b>	1	10% (10)	Continuous	All
	<b>Report</b>	-	-	-	-
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	10	LO # 1-10
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Absolute error & relative error calculations.
Week 2	Taylor series
Week 3	Numerical Differentiation- Forward differentiation
Week 4	Numerical Differentiation- Backward differentiation
Week 5	Numerical Differentiation- Central differentiation
Week 6	Roots of equations
Week 7	Numerical integration
Week 8	Review of basic matrix terminology and operation
Week 9	Systems of linear algebraic equation
Week 10	Systems of non-linear algebraic equation
Week 11	Mid-term exam
Week 12	Least square curve fitting
Week 13	Interpolation
Week 14	Numerical solution of differential equation
Week 15	Numerical solution of differential equation
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Chapra, Steven C., and Raymond P. Canale. Numerical methods for engineers. Boston: McGraw-Hill Higher Education, 2010.	Yes
Recommended Texts		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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Orthosis I		Module Delivery
Module Type	Core learning activity		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER223		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	2	Semester of Delivery	
Administering Department	09	College	03
Module Leader	fahad.mohanad@nahrainuniv.edu.iq	e-mail	fahad.mohanad@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To understand types of deformity of lower and upper limb</li><li>2. To know the aim and indication of use orthosis</li><li>3. To understand types of lower and upper limb orthosis</li><li>4. To identify the procedure of manufacturing orthosis</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Learning the students types lower and upper limb orthoses</li><li>2. Learning the students, the principles of work the orthosis</li><li>3. To understand the indication and contraindication of using each orthosis</li><li>4. Learning the students how select the suitable orthosis for treatment the deformity</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Biomechanics of the lower limb parts , principles in lower Orthoses and orthotist [6 hrs]</p> <p>Three point pressure correction , Type of Ankle Foot Orthosis , Manufacturing of Ankle Foot Orthosis [ 8 hrs]</p> <p>Type of knee joint , Types of Knee Ankle Foot Orthosis , Manufacturing of Knee Ankle Foot Orthosis [6 hrs]</p> <p>Type of Hip orthosis and HKAFO , Hip-knee-ankle-foot orthoses [6 hrs]</p> <p>Principles and components of upper limb orthoses [6 hrs]</p> <p>Three point pressure correction, Type of hand Orthosis [6 hrs]</p> <p>Manufacturing of Hand Orthosis Practical Lecture ,Type of Wrist Orthosis ,Type of shoulder orthosis [6 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to develop students in orthosis I and encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills a .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of questions in class and homework .</p>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	128	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8.5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

<b>Module Evaluation</b> 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, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects/Lab</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction and Terminology, Biomechanical principles of orthotic design , Anatomy of the lower limb parts (Bones, muscles, and nerves)
<b>Week 2</b>	Biomechanics of the lower limb parts , General principles in lower Orthoses and orthotist
<b>Week 3</b>	List the types of lower extremity orthoses , Orthoses materials and Types of Deformity
<b>Week 4</b>	Three point pressure correction , Type of Ankle Foot Orthosis , Manufacturing of Ankle Foot Orthosis
<b>Week 5</b>	Type of knee joint , Types of Knee Ankle Foot Orthosis , Manufacturing of Knee Ankle Foot Orthosis
<b>Week 6</b>	Manufacturing of Knee Ankle Foot Orthosis , Practical Lecture , Type of knee joint
<b>Week 7</b>	Mid-term Exam + Type of Hip orthosis and HKAFO , <b>Hip-knee-ankle-foot orthoses</b>
<b>Week 8</b>	Anatomy of the upper limb parts (Bones,muscles,and nerves), Biomechanics of the upper limb parts
<b>Week 9</b>	Principles and components of upper limb orthoses, General principles in upper Orthoses

<b>Week 10</b>	List the types of upper extremity orthoses , Orthoses materials and Types of Deformity
<b>Week 11</b>	Three point pressure correction, Type of hand Orthosis
<b>Week 12</b>	Manufacturing of Hand Orthosis Practical Lecture
<b>Week 13</b>	Type of Wrist Orthosis ,Type of shoulder orthosis
<b>Week 14</b>	Functional bracing of selected upper limb fracture
<b>Week 15</b>	Orthoses for overuse disorders of the upper limb
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Manufacturing Foot Orthosis
<b>Week 2</b>	Manufacturing of Ankle Foot Orthosis (flexible type)
<b>Week 3</b>	Manufacturing of Ankle Foot Orthosis (Rigid type)
<b>Week 4</b>	Manufacturing of Knee Ankle Foot Orthosis
<b>Week 5</b>	Manufacturing of Hand Orthosis
<b>Week 6</b>	Manufacturing of Hand -wrist Orthosis
<b>Week 7</b>	Manufacturing of elbow Orthosis

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	ICRC+ISPO	No
<b>Recommended Texts</b>	Cambodian School of Prosthetics and Orthotics	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

ثابت بدون تغيير

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Orthosis II</b>		Module Delivery
Module Type	Core learning activity		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER320</b>		
ECTS Credits	<b>8</b>		
SWL (hr/sem)	<b>200</b>		
Module Level	3	Semester of Delivery	
Administering Department	09	College	03
Module Leader	fahad.mohanad@nahrainuniv.edu.iq	e-mail	fahad.mohanad@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To understand types of deformity of spinal</li><li>2. To know the aim and indication of use spinal orthosis</li><li>3. To understand types of spinal orthosis</li><li>4. To identify the procedure of manufacturing spinal orthosis</li><li>5. Design the orthoses using mathematical models</li><li>6. Study the types of stress generates in orthosis</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Learning the students types of spinal orthoses</li><li>2. Learning the students, the principles work the spinal orthosis</li><li>3. To understand the indication and contraindication of using each type of spinal orthosis</li><li>4. Learning the students how design orthoses</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Principles and components of spinal orthoses , General principles spinal orthosis [6 hrs]</p> <p>Orthoses materials and Types of Deformity , Three point pressure correction [ 8 hrs]</p> <p>Type of Cervical Orthosis , Lumber-Sacral orthosis , Thoraco Lumbar Sacral , Cerveco thoracic lumber sacral orthosis [10 hrs]</p> <p>Orthoses for spinal deformities ,Measuring angle of deformity method [6 hrs]</p> <p>Simple Stresses in Orthosis, Hoop stress in Socket ,Longitudinal stress in Socket , Interface Pressure Measurement [10 hrs]</p> <p>Calculation And Design Of Spring Elements For (Ankle Joint) And (Knee Joint) Orthosis Theoretical Analysis of AFO [8 hrs]</p> <p>Exoskeletons orthosis ,Buckling in the lower Orthoses ,Main Parts of Exoskeletons Orthosis [10 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to develop students in orthosis II and encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills a .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and</p>
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solving samples of questions in class and homework .

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	128	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8.5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

### 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, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects/Lab</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	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

	Material Covered
<b>Week 1</b>	Anatomy of spinal orthosis (Bones, muscles, and nerves), Biomechanics of spinal orthosis
<b>Week 2</b>	Principles and components of spinal orthoses , General principles spinal orthosis
<b>Week 3</b>	Principles and components of spinal orthoses , List the types of spinal orthosis
<b>Week 4</b>	Orthoses materials and Types of Deformity , Three point pressure correction
<b>Week 5</b>	Type of Cervical Orthosis , Lumber-Sacral orthosis
<b>Week 6</b>	Thoraco Lumbar Sacral
<b>Week 7</b>	Mid-term Exam + Cervico thoracic lumber sacral orthosis



<b>Week 8</b>	Orthoses for spinal deformities ,Measuring angle of deformity method
<b>Week 9</b>	Simple Stresses in Orthosis, Hoop stress in Socket
<b>Week 10</b>	Longitudinal stress in Socket , Interface Pressure Measurement
<b>Week 11</b>	Calculation And Design Of Spring Elements For (Ankle Joint) And (Knee Joint) Orthosis
<b>Week 12</b>	Theoretical Analysis of AFO
<b>Week 13</b>	Exoskeletons orthosis
<b>Week 14</b>	Buckling in the lower Orthoses
<b>Week 15</b>	Main Parts of Exoskeletons Orthosis
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Measuring spinal deformity
<b>Week 2</b>	Assessment and preparing the patient to casting orthosis
<b>Week 3</b>	Manufacturing of spinal orthosis (jacket model)
<b>Week 4</b>	Manufacturing of spinal orthosis (jacket model)
<b>Week 5</b>	Manufacturing of spinal orthosis (O brace)
<b>Week 6</b>	Manufacturing of spinal orthosis (O brace)
<b>Week 7</b>	Manufacturing of spinal orthosis (Boston brace)

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	ICRC+ISPO	No
<b>Recommended Texts</b>	Cambodian School of Prosthetics and Orthotics	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

ثابت بدون تغيير

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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Orthotic Clinical Practice		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER421		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	4	Semester of Delivery	
Administering Department	09	College	03
Module Leader	fahad.mohanad@nahrainuniv.edu.iq	e-mail	fahad.mohanad@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Orthosis I, Orthosis II	Semester	4,6
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Clinical Practice to learn the type of deformity for spinal, lower ,and upper limb</li><li>2. To know the aim and indication of use orthosis</li><li>3. To understand types of lower and upper limb orthosis</li><li>4. Clinical Practice of manufacturing orthosis</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Learning the students types lower and upper limb orthoses</li><li>2. Learning the students, the principles of work the orthosis</li><li>3. To understand the indication and contraindication of using each orthosis</li><li>4. Learning the students how select the suitable orthosis for treatment the deformity</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>AFO types prescribe (Clinical diagnosis and Examination on the patient), Foot Drop Clinical diagnosis and Examination on the patient [10 hrs]</p> <p>Clubfoot Deformity Clinical diagnosis and Examination on the patient , (The Ponseti method +Dines Brown) [10 hrs]</p> <p>Cavus Foot +Flat Foot (Causes , Symptoms, Diagnosis, Treatment) , Intoeing at different level of the lower limb (Causes , Symptoms, Diagnosis, Treatment) [ 10 hrs]</p> <p>Bowleg Deformity + knock knee , (Causes , Symptoms,Diagnosis, Treatment) Knee Hyperextension + knee flexion (Causes , Symptoms, Diagnosis, Treatment) [ 10 hrs]</p> <p>KAFO types prescribe (Clinical diagnosis and Examination on the patient), Foot types prescribe (Clinical diagnosis and Examination on the patient) [ 10 hrs]</p> <p>Cubitus valgus ,Cubitus varus [ 8 hrs]</p> <p>Sprengel's deformity [ 4 hrs]</p> <p>Swan neck deformity , Boutonniere deformity [ 4 hrs]</p> <p>Ulnar Deviation or Ulnar Drift , Drop wrist deformity [ 4 hrs]</p> <p>Fixed Elbow ,Bent wrist [ 4 hrs]</p> <p>Pronated forearm ,Clenched fist [ 4 hrs]</p> <p>Thumb in palm , Scoliosis Deformity [ 4 hrs]</p> <p>Erb's Palsy [ 4 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to develop students in Orthotic Clinical Practice and encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills a .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of questions in class and homework .
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	114	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	$114/15=7.6$
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	$86/15=5.7$
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

## 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, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects/Lab</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	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>	AFO types prescribe (Clinical diagnosis and Examination on the patient), Foot Drop Clinical diagnosis and Examination on the patient

<b>Week 2</b>	Clubfoot Deformity Clinical diagnosis and Examination on the patient , (The Ponseti method +Dines Brown)
<b>Week 3</b>	Cavus Foot +Flat Foot (Causes , Symptoms, Diagnosis, Treatment) , Intoeing at different level of the lower limb (Causes , Symptoms, Diagnosis, Treatment)
<b>Week 4</b>	Bowleg Deformity + knock knee , (Causes , Symptoms,Diagnosis, Treatment)
<b>Week 5</b>	Knee Hyperextension + knee flexion (Causes , Symptoms, Diagnosis, Treatment),
<b>Week 6</b>	KAFO types prescribe (Clinical diagnosis and Examination on the patient), Foot types prescribe (Clinical diagnosis and Examination on the patient)
<b>Week 7</b>	Mid-term Exam + Clinical diagnosis and Examination on the patient on different cases
<b>Week 8</b>	Cubitus valgus ,Cubitus varus
<b>Week 9</b>	Sprengel's deformity
<b>Week 10</b>	Swan neck deformity , Boutonniere deformity
<b>Week 11</b>	Ulnar Deviation or Ulnar Drift , Drop wrist deformity
<b>Week 12</b>	Fixed Elbow ,Bent wrist
<b>Week 13</b>	Pronated forearm ,Clenched fist
<b>Week 14</b>	Thumb in palm , Scoliosis Deformity
<b>Week 15</b>	Erb's Palsy
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Manufacturing Foot Orthosis
<b>Week 2</b>	Manufacturing of Ankle Foot Orthosis (flexible type)
<b>Week 3</b>	Manufacturing of Ankle Foot Orthosis (Rigid type)
<b>Week 4</b>	Manufacturing of Knee Ankle Foot Orthosis
<b>Week 5</b>	Manufacturing of Hand Orthosis
<b>Week 6</b>	Manufacturing of Hand -wrist Orthosis
<b>Week 7</b>	Manufacturing of elbow Orthosis

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	ICRC+ISPO	No
<b>Recommended Texts</b>	Cambodian School of Prosthetics and Orthotics	No
<b>Websites</b>		

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Physics		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	PHYS120			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr.Dunya Abdulsahib Hashim		e-mail	dunia.abdalsahip@nahrainuniv.edu.iq
Module Leader's Acad. Title	Ass.Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Professor.Dr.Mahmud Rasheed Ismail		e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Peer Reviewer Name				
Scientific Committee Approval Date	01/06/2023	Version Number	4.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Biomaterial POER220	Semester	4
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 understand basics for physics</li><li>2. To understand theoretical and practical on the various branches of physics and their development in all its types and applications.</li><li>3. To Give students the tool for Universal forces Units and physics Quantities</li><li>4. To Know the basics for analysis and serve specific problems</li><li>5. To learn the general law and application of physics</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Introduction and Physical Quantities and Units</li><li>2. Mechanichs and laws for each types of motion</li><li>3. Thermodynamics and law</li><li>4. Basic of vibration and types of wave ,</li><li>5. Electric and magnatic filds and equations for each terms</li><li>6. The differents between classic and modern physics</li><li>7. Laser and optics and application</li><li>8. Types of material physics and general properties</li><li>9. Sound and light</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Physics Definitions , Applications , Quantities and Unitss [ 10 hrs],Mechanics , Motion in One and twon Dimension , Vectors,The Laws of Motion[10 hrs] , Energy ,work ,Thermodynamics , Thermal Physics , Energy in Thermal Processes , The Laws of Thermodynamics [8hrs],Vibrations and types of Waves [10 hrs], Electricity and Magnetism ,Electric Forces and Electric Fields</p> <p>Electrical Energy and Capacitance , Current and Resistance[10 hrs] , Direct-Current Circuits Magnetism[10 hrs], Light and Optics , Reflection and Refraction of Light , The Nature of Light ,[10hrs] The Law of Refraction and total Internal Reflection, Dispersion and Prisms[10hrs], Mirrors and Lenses and Wave Optics[10hrs], Optical Instruments</p> <p>Modren physics Material physics [10 hrs] modern physics and class[8 hrs], momentum ,impals and tourque [6 hrs], unit cell , primitive cell,types of bond miller indices[10 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to develop students in orthotics and prosthetic engineering field, application of different types of physics. This will be achieved through classes, interactive tutorials, asking questions, discussions and seminars in class and homework ..
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	114	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7.5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (15)	5, 10	LO #1,2, 4 and 5
	Assignments	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 7
	Projects	-	-	-	-
	Report	1	10% (10)	14	LO # 7 and 8
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 3 to 7
	Final Exam	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

مفردات المنهج المحدثة من لجنة  
تطوير المناهج

	Material Covered
Week 1	What is Physics?._ Definitions and Applications
Week 2	Mechanics , Motion in One Dimension , Vectors and Two-Dimensional Motion , The Laws of Motion
Week 3	Energy ,work , Momentum ,torque and Collisions , Rotational Motion, Rotational Equilibrium and the Law of Gravity ,7 Solids and Fluids
Week 4	Thermodynamics , Thermal Physics
Week 5	Vibrations and Waves
Week 6	Electricity and Magnetism
Week 7	Light and Optics
Week 8	Optical Instruments
Week 9	Modern physics
Week 10	relativity , Quantum physics
Week 11	Material physics
Week 12	crystal and amorphous material,types of material
Week 13	unit cell , primitive cell,types of bond
Week 14	Miller indices
Week 15	report
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

في حالة وجود مختبر ... توضع التجارب

	Material Covered
Week 1	HOOKE'S LAW spring
Week 2	Acceleration of free fall by mean of the Simple pendulum
Week 3	Forces
Week 4	The surface tension of water by the pull of microscope slide
Week 5	Refractive index of (glass) by real and apparent depth using traveling microscope
Week 6	Moment of inertia and angular acceleration
Week 7	7-corrosion. (corrosion instrument)

### Learning and Teaching Resources

## مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	University Physics, Seventh Edition (Sear / Zemasky / Young 2019)	No
<b>Recommended Texts</b>	Practical of physics	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

ثابت بدون تغيير

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Chemistry		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CREQ111		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Lec.Yousra Saber Kareem	e-mail	yousra.saber@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Prof.Dr.Mahoud Rasheed	e-mail	Muhmood.rasheed@nahrainuniv.edu.iq
Scientific Committee Approval Date	02/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module			
Co-requisites module			

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To understand the principles and applications of modern chemistry instrumentation, experimental design and data analysis.</li><li>2. To distinguish between Analytical chemistry and other branches of chemistry</li><li>3. To understand the properties (physical and chemical) and the benefits of materials.</li><li>4. To perform the methods of concentration evaluation.</li><li>5. To understand the types of thermos chemical reactions, reaction constant, the factors affecting on them.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Introduce basic definitions and introductory concepts of analytical chemistry.</li><li>2. Show the different methods to prepare solutions with different concentrations and PH.</li><li>3. Explains the methods to control the precipitation process.</li><li>4. Show the methods for the quantitative calculations of oxidation reduction reactions.</li><li>5. Explains how different quantitative measurements equipments works for the calculations of concentrations, such as atomic absorption spectrophotometry, UV spectrometer, gas chromatography ... etc.</li><li>6. Provide a background to higher level courses involving dealing with different solutions.</li><li>7. Provide a strong quantitative and analytical understanding to the students in order to be able to deal with different solution concentrations and its preparation in chemical industry</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction to analytical chemistry, stoichiometric calculations, and periodic table. [8 hrs]</p> <p>Calculation of Normality, Molarity, and Molality, evaluation of density, percent [ 8 hrs]</p> <p>Equilibrium in the acids and bases, Indicators of bases and acids, Equilibrium in precipitation [8 hrs]</p> <p>Partial precipitation, analysis using oxidation and reduction [8 hrs]</p> <p>Factors effecting the chemical reaction, calculation of dilution [8 hrs]</p> <p>Calculation of equilibrium constant and solving examples [8 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to give the students background and strong basic to higher level courses involving dealing with different solutions specifically during dealing with solutions in laboratory. .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of problems in class and homework .
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

مصدر معلومات الجدول من  
شيت الاكسل للمناهج

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	72/15=4.8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	53/15=3.5
<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>	Quizzes	2	15% (15)	5, 10	LO #1,2, 4 and 5
	Assignments	4	10% (10)	2,4,6,8,	LO # 3,6,9 and 10
	Projects	1	5%(5)	4	LO # 1 to 4
	Report	1	10% (10)	8	LO # 7 and 8
<b>Summative assessment</b>	Midterm Exam	2 hr	10% (10)	8	LO # 3 to 7
	Final Exam	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Foundation: Atoms, molecules and ionic compounds; masses of atoms; stoichiometry; naming of chemical compounds; physical properties of compounds; and periodic table.
Week 2	Chemical Reactions: Chemical equations; major reaction types; and enthalpy of chemical processes.
Week 3	Atoms: Light; electrons; quantum numbers; atomic orbitals; electronic configurations; and general periodic trends in properties among elements
Week 4	Chemical Bonding: Nature of chemical bonding; ionic bond; covalent bond; valence bond theory and hybridization; resonance; molecular shape by VSEPR method; bond polarity; intermolecular forces.
Week 5	Chemistry of Carbon: Naming of compounds containing carbon chains and rings; isomerism, regioisomers, and optical isomers; major functional groups: alkanes, alkenes, alcohols, aldehydes, ketones, carboxylic acids, and esters; major reactions and properties of functional groups.
Week 6	Measurement in Chemistry: Significant figures; SI units; substances and mixtures; solution and concentration; mole and Avogadro's number; chemical reactions and balanced equations; and temperature scales.
Week 7	Principle of Chemical Equilibria: law of chemical equilibrium and equilibrium constant; and Le Chatelier principle.
Week 8	Acid–Base Equilibria in Aqueous Solutions: Acid and Base concepts, Ionization of water; pH, pOH, and pK <sub>w</sub> ; acids and bases; polyprotic acids; buffers; and solubility equilibria.
Week 9	Solubility and Complex–Ion Equilibria: Solubility constants and solubility; common ion effects; precipitation; and equilibria involving complex ions.
Week 10	Structures and Reactions of Organic Compounds: Organic compounds and structures, naming compounds, stereoisomerisms; functional groups of organic compounds; nucleophilic substitution reactions addition reactions of alkenes; electrophilic aromatic substitution
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	Preparatory week before the final Exam



## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Douglas A. Skoog / fundamentals of analytical chemistry	yes
Recommended Texts	Jeffrey S. Gaffny Nancy A. Marley / General Chemistry for Engineering	yes
Websites	<a href="https://pubs.acs.org/journal/ancham">https://pubs.acs.org/journal/ancham</a> <a href="https://www.nature.com/subjects/analytical-chemistry">https://www.nature.com/subjects/analytical-chemistry</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

**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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Programming</b>		Module Delivery
Module Type	<b>Basic</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>UREQ111</b>		
ECTS Credits	<b>4</b>		
SWL (hr/sem)	<b>100</b>		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Lec.Yousra Saber Kareem	e-mail	yousra.saber@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor			
Peer Reviewer Name	Assist Prof.Dr. Ammar Esam	e-mail	ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module			
Co-requisites module			

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Learn about writing vectors and matrices using MATLAB.</li><li>2. Learn about programming using different functions in MATLAB.</li><li>3. Familiarity with two- and three-axis drawing using MATLAB.</li><li>4. Identify the functions of reflection, zoom in and out using MATLAB.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Learn about programming using MATLAB.</li><li>2. Identifying MATLAB programming applications by linking them to practical reality.</li><li>3. Identifying in detail the use of MATLAB functions and linking them to case studies in the department's specialization.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction, MATLAB Windows, Priority in Operations Mathematics. [7 hrs]</p> <p>Numbers Types, Variables Names, Vectors. [ 5 hrs]</p> <p>Matrices – Two-Dimensional Array part1, Matrices – Two-Dimensional Array part2 [7 hrs]</p> <p>Script files, Function program, Scripts vs. Functions, If condition, For statement, While statement, The derivative of polynomial equation. Part1, The derivative of polynomial equation.part2, The integral of polynomials equations, Two Dimensional Plots part1, Two Dimensional Plots part2. [ 9hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The course description provides a full explanation of the basics of programming using MATLAB, in addition to identifying the special and important functions in the application of MATLAB, which serve the specialization of the section from the functions of drawing, rotation, zooming in, zooming out and reflection, all the way to learning programming in order to achieve the goal in integrating the design process with programming. This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of problems in class and homework .</p>
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	72/15=4.8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	28	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	28/15=1.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (15)	5, 10	LO #1,2, 4 and 5
	Assignments	4	10% (10)	2,4,6,8,	LO # 3,6,9 and 10
	Projects	-	-	-	-
	Report (lab)	5	15% (15)	2,4,6,10,12	LO # 2,6,10 and 11
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 3 to 7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to MATLAB language,
Week 2	Format and numbers, Variables
Week 3	Matrix building I
Week 4	Matrix building II
Week 5	Programming in MATLAB using M file,
Week 6	Programming by create script-file, Programming by create function-file.
Week 7	Logical commands I
Week 8	Midterm Examination 1
Week 9	Logical commands II
Week 10	Loops I
Week 11	Loops II
Week 12	Conditional commands I
Week 13	Conditional commands II
Week 14	Midterm Examination 2
Week 15	
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to MATLAB System
Week 2	MATLAB Vector, Matrices, Special Functions, Commands Logical and comparison
Week 3	Programming in MATLAB
Week 4	Condition statements and looping
Week 5	polynomial equation
Week 6	Plotting (2D,3D)
Week 7	Representing two-dimensional geometric shapes

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lee, H., " Programming and Engineering Computing with MATLAB 2017", SDC publication, September,2017. -	No
Recommended Texts	Hunt, B. R., Lipsman, R. L., and Rosenberg, J. M., " A Guide to MATLAB for Beginners and Experienced Users", Cambridge University Press,2001.	yes
Websites	<a href="https://www.mathworks.com/MATLABcentral">https://www.mathworks.com/MATLABcentral</a>	

Grading Scheme				
مخطط الدرجات				
ثابت بدون تغيير				
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>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Prostheses I		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	POER212			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	2	Semester of Delivery		3
Administering Department	09	College	03	
Module Leader	Assist Prof. Saif M. Abbas		e-mail	<a href="mailto:saif.mohammed@nahrainuniv.edu.iq">saif.mohammed@nahrainuniv.edu.iq</a>
Module Leader's Acad. Title	Assist Professor		Module Leader's Qualification	Ms.C.
Module Tutor			e-mail	
Peer Reviewer Name	Dr.Mahmud Rasheed Ismail		e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Scientific Committee Approval Date	03/06/2023		Version Number	1.0

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
Co-requisites module	Prosthetic II		Semester	5



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To understand types of lower limb amputation</li><li>2. To identify the types of lower prosthesis</li><li>3. To distinguish between levels of amputation</li><li>4. To perform the type of Components Sockets, Suspension Shanks and Feet.</li><li>5. To proper Alignment for each type of lower prosthesis</li><li>6. To understand the experimental procedure for lower limb prosthesis</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Identify the types of lower extremities</li><li>2. Identify the types of Foot , Ankle, Knee and Hip joint</li><li>3. Learning the types of socket</li><li>4. Learning the types of suspension</li><li>5. Learning the types of amputation</li><li>6. Performing the components of prosthetic device</li><li>7. Performing the Alignment of prosthesis</li><li>8. Learning the biomechanics Socket and Socket Shape Variations</li><li>9. Learning the Gait Analysis with amputation</li><li>10. Understanding Experimental manufacturing of prosthesis</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction to Prosthesis, Prosthesis in Foot and Ankle Amputation [2 hrs]</p> <p>Components &amp; Prescription principles, Biomechanics Socket and Socket Shape Variations [6 hrs]</p> <p>Prosthesis in Transtibial Amputation, Components Sockets, Suspension Shanks and Feet, Alignment of Below Knee Prosthetic [8 hrs]</p> <p>Prosthesis in Knee Disarticulation [4 hrs]</p> <p>Gait Analysis in Transtibial and Knee Disarticulation Amputation [6 hrs]</p> <p>Prosthesis in Transfemoral Amputation, Biomechanics Socket and Socket Shape Variations, Components &amp; Alignment [8 hrs]</p> <p>Prosthesis in hip Disarticulation, Stump anatomy and biomechanics [6 hrs]</p> <p>Gait Analysis in Transemoral and hip Disarticulation Amputation [4 hrs]</p> <p>..</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	
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	The main strategy that will be adopted in delivering this module is to learn students in lower limb prosthesis levels and be familiar with level of amputation ,type of joint for ankle knee and hip and learn the stages of experimental procedure for each level of amputation .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of problems in class and homework
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	128	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8.5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	15% (15)	2,4,6,8,10	LO #1,3, 6,10 and 12
	<b>Assignments</b>	2	15% (15)	4,8	LO # 3,7,9 and 10
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	15	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction to Prosthesis

<b>Week 2</b>	Prosthesis in Foot and Ankle Amputation
<b>Week 3</b>	Components & Prescription principles
<b>Week 4</b>	Biomechanics Socket and Socket Shape Variations
<b>Week 5</b>	Prosthesis in Transtibial Amputation
<b>Week 6</b>	Components Sockets, Suspension Shanks and Feet.
<b>Week 7</b>	Alignment of Below Knee Prosthetic
<b>Week 8</b>	Prosthesis in Knee Disarticulation
<b>Week 9</b>	Gait Analysis in Transtibial and Knee Disarticulation Amputation
<b>Week 10</b>	Prosthesis in Transfemoral Amputation
<b>Week 11</b>	Biomechanics Socket and Socket Shape Variations
<b>Week 12</b>	Components & Alignment
<b>Week 13</b>	Prosthesis in hip Disarticulation
<b>Week 14</b>	Stump anatomy and biomechanics
<b>Week 15</b>	Gait Analysis in Transemoral and hip Disarticulation Amputation
<b>Week 16</b>	

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Measurement, Manufacturing and Alignment of Partial Foot Prosthesis Test.
<b>Week 2</b>	Measurement, Manufacturing and Alignment of Partial Foot Prosthesis Test.
<b>Week 3</b>	Measurement, Manufacturing and Alignment of Partial Foot Prosthesis Test.
<b>Week 4</b>	Measurement, Manufacturing and Alignment of Partial Foot Prosthesis Test.
<b>Week 5</b>	Measurement, Manufacturing and Alignment of Ankle Disarticulation Prosthesis Test.
<b>Week 6</b>	Measurement, Manufacturing and Alignment of Ankle Disarticulation Prosthesis Test.
<b>Week 7</b>	Measurement, Manufacturing and Alignment of Ankle Disarticulation Prosthesis Test.
<b>Week 8</b>	Measurement ,Manufacturing and Alignment of Below Knee Prosthesis Test.
<b>Week 9</b>	Measurement ,Manufacturing and Alignment of Below Knee Prosthesis Test.
<b>Week 10</b>	Measurement ,Manufacturing and Alignment of Below Knee Prosthesis Test.
<b>Week 11</b>	Measurement ,Manufacturing and Alignment of Below Knee Prosthesis Test.
<b>Week 12</b>	Measurement ,Manufacturing and Alignment of Through Knee Prosthesis Test.

<b>Week 13</b>	Measurement ,Manufacturing and Alignment of Through Knee Prosthesis Test.
<b>Week 14</b>	Measurement ,Manufacturing and Alignment of Through Knee Prosthesis Test.
<b>Week 15</b>	

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>Prosthetics and orthotics / Donald Shurr, John W. Michael.</li> <li>Short Textbook of Prosthetics and Orthotics</li> <li>Lower Limb Amputation A Guide to Living a Quality Life</li> </ul>	No
<b>Recommended Texts</b>	Cambodian School of Prosthetics and Orthotics.	No
<b>Websites</b>		

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 - 49)</b>	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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Prostheses II		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	POER311			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	3	Semester of Delivery		5
Administering Department	09	College	03	
Module Leader	Assist Prof. Saif M. Abbas		e-mail	<a href="mailto:saif.mohammed@nahrainuniv.edu.iq">saif.mohammed@nahrainuniv.edu.iq</a>
Module Leader's Acad. Title	Assist Professor		Module Leader's Qualification	Ms.C.
Module Tutor			e-mail	
Peer Reviewer Name	Dr.Mahmud Rasheed Ismail		e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Scientific Committee Approval Date	03/06/2023		Version Number	1.0

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Prosthetic I		Semester	3
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 understand types of upper limb amputation</li> <li>2. To identify the types of upper prosthesis</li> <li>3. To distinguish between levels of amputation</li> <li>4. To perform the type of Components Sockets, Suspension and Hand.</li> <li>5. To proper Alignment for each type of upper prosthesis</li> <li>6. To understand the experimental procedure for lower limb prosthesis</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Identify the types of upper extremities</li> <li>2. Identify the types of hand , wrist, elbow and shoulder joint</li> <li>3. Learning the types of socket</li> <li>4. Learning the types of suspension</li> <li>5. Learning the types of amputation</li> <li>6. Performing the components of prosthetic device</li> <li>7. Performing the Alignment of prosthesis</li> <li>8. Learning the biomechanics Socket and Socket Shape Variations</li> <li>9. Learning the smart Prosthesis</li> <li>10. Understanding Experimental manufacturing of prosthesis</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Upper limb prosthetic anatomy and Biomechanics , Terminal Devises, Voluntary Hooks and Hands [2 hrs]</p> <p>Wrist, Elbow and Shoulder Units, Type of Suspension Methods [6 hrs] Prosthetic Options for The Partial Hand Amputee, Components of The Hand and Wrist Disarticulation Prosthetic, Prosthetic Options for The Transradial Amputee [8 hrs]</p> <p>Prosthetic Options for The Trans humeral Amputee [6 hrs] Prosthetic Options for The Elbow Disarticulation Amputee [4 hrs] Prosthetic Options for The Shoulder Disarticulation and Forequarter Amputee, Biomechanics Socket and Socket Shape Variations and materials [6 hrs] Introduction to smart Prosthesis[2 hrs]</p> <p>Optimization of socket materials, Dual limb amputation [6 hrs]</p> <p>Spatial prosthesis for children and olds [4 hrs]</p> <p>..</p>

## Learning and Teaching Strategies

## استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to learn students in upper limb prosthesis levels and be familiar with level of amputation ,type of joint for wrist, elbow and shoulder and learn the stages of experimental procedure for each level of amputation .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of problems in class and homework
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	128	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8.5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	15% (15)	2,4,6,8,10	LO #1,3, 6,10 and 12
	<b>Assignments</b>	2	15% (15)	4,8	LO # 3,7,9 and 10
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	15	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Upper limb prosthetic anatomy and Biomechanics
Week 2	Terminal Devises, Voluntary Hooks and Hands
Week 3	Wrist, Elbow and Shoulder Units
Week 4	Type of Suspension Methods
Week 5	Prosthetic Options for The Partial Hand Amputee
Week 6	Components of The Hand and Wrist Disarticulation Prosthetic
Week 7	Prosthetic Options for The Transradial Amputee
Week 8	Prosthetic Options for The Trans humeral Amputee
Week 9	Prosthetic Options for The Elbow Disarticulation Amputee
Week 10	Prosthetic Options for The Shoulder Disarticulation and Forequarter Amputee
Week 11	Biomechanics Socket and Socket Shape Variations and materials
Week 12	Introduction to smart Prosthesis
Week 13	Optimization of socket materials
Week 14	Dual limb amputation
Week 15	Spatial prosthesis for children and olds
Week 16	

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Measurement ,Manufacturing and Alignment of Below Elbow Prosthesis Test.
Week 2	Measurement ,Manufacturing and Alignment of Below Elbow Prosthesis Test.
Week 3	Measurement ,Manufacturing and Alignment of Below Elbow Prosthesis Test.
Week 4	Measurement ,Manufacturing and Alignment of Though Elbow Prosthesis Test.
Week 5	Measurement ,Manufacturing and Alignment of Though Elbow Prosthesis Test.
Week 6	Measurement ,Manufacturing and Alignment of Though Elbow Prosthesis Test.
Week 7	Measurement ,Manufacturing and Alignment of Above Elbow Prosthesis Test.
Week 8	Measurement ,Manufacturing and Alignment of Above Elbow Prosthesis Test.



<b>Week 9</b>	Measurement ,Manufacturing and Alignment of Above Elbow Prosthesis Test.
<b>Week 10</b>	Measurement ,Manufacturing and Alignment of Hip Disarticulation Prosthesis Test.
<b>Week 11</b>	Measurement ,Manufacturing and Alignment of Hip Disarticulation Prosthesis Test.
<b>Week 12</b>	Measurement ,Manufacturing and Alignment of Hip Disarticulation Prosthesis Test.
<b>Week 13</b>	
<b>Week 14</b>	
<b>Week 15</b>	

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>Prosthetics and orthotics / Donald Shurr, John W. Michael.</li> <li>Short Textbook of Prosthetics and Orthotics</li> <li>Amputation, Prosthesis Use, and Phantom Limb Pain</li> <li>An Interdisciplinary Perspective</li> </ul>	No
<b>Recommended Texts</b>	Cambodian School of Prosthetics and Orthotics.	No
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Strength of Materials		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER211		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	1
Administering Department	06	College	03
Module Leader	Dr. Ammar Issam Kubba	e-mail	ammar.i.salih@nahrainuniv.edu.iq
Module Leader's Acad. Title	Assist. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	6
Peer Reviewer Name	Dr.Yaser Yareb Khatan	e-mail	yasir.yaarb@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	POER110 Statics	Semester	1
Co-requisites module	POER411 Mechanical Design	Semester	7

## 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. problem-solving, To develop the required skills and learn the basic concepts of stress and strain.</li><li>2. Experimentation and data analysis, run several tests in the laboratory to know the basics of the strength of materials science.</li><li>3. Engineering knowledge<ol style="list-style-type: none"><li>a. To understand the terms of safety factor, yield stress and strain.</li><li>b. This course deals with the basic concept of shear stress and its types, i.e. shear in pins and bolts, torsion, and shear strain.</li><li>c. To perform more complex bar structural and nodes analysis.</li><li>d. To understand the basic effect of temperature changes on stress and strain in bars problems.</li><li>e. To perform shear force diagram and bending moment diagram on beams.</li><li>f. To learn how to analyze beam stress and deflection, and its application in prosthesis applications.</li><li>g. To understand the basic stress analysis of thin cylinders, and its application in prosthesis applications.</li></ol></li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize how forces flow through the structural items and how it results in stress and strain.</li><li>2. List the various terms associated with values of stress and strain in any structural item.</li><li>3. Summarize what is meant by the types of stress and strain.</li><li>4. Describe how the safety factor concept works and how it is important in everyday life applications.</li><li>5. Define bars and beams and recognize the differences between them.</li><li>6. Identify the basic torsion load effects on a shaft, then recognize what type of stress is the result of such external load.</li><li>7. Discuss the procedure of finding the shear force and bending moment diagrams.</li><li>8. Explain how stress and deflection happened in beams due to external loads such as forces and moments.</li><li>9. Identify how thin cylinders stress is different from direct stress.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><u>Part A – Stress and Strain</u> Stress and strain definitions, types, applications and recognition. Introduction to thermal stress, safety factor and its applications in everyday life applications and prosthetics. [15 hrs]</p> <p>Torsion – Torsion loads and how it results in shear stress and shear strain. Application</p>

	<p>on torsion loads for circular shafts. [6 hrs]</p> <p>Shear force and bending moment diagrams – learning how to sketch the Shear force and bending moment diagrams, then find their values. Using several approaches to sketch and determine the values of the Shear force and bending moment diagrams. [15 hrs]</p> <p><u>Part B – Beam Bending stress and beam deflections</u></p> <p>Bending stress. Recognition of bending stress in beams, and how it differs from direct stress in bars. Knowing the factors that affect bending stress values and how each factor can be modified to find the required beam performance. [14 hrs]</p> <p>Deflection in beams. Finding the factors that affect the beam’s deflection, and how it can be calculated to find deflection at any point of the beam. Using different approaches to determine the deflection in beams according to the loading conditions and the beam supports types [14 hrs]</p>
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<p style="text-align: center;"><b>Learning and Teaching Strategies</b></p> <p style="text-align: center;">استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering a range of simple experiments involving some sampling activities that are interesting to the students, also by conducting several laboratory experiments which introduce the basic concept of what students learned in the theoretical lectures.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5.7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	5, 8, 13	LO #1, 2, 3, 6, 7, 10 and 11
	<b>Assignments</b>	1	5% (5)	12	LO # 1 to 10
	<b>Projects / Lab.</b>	1	15% (15)	Continuous	All
	<b>Report</b>	1	5% (5)	14	LO # 9 to 13
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	8	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction to the fundamental principles, stress and strain.
<b>Week 2</b>	Types of stress, direct and indirect. Thermal stress and strain.
<b>Week 3</b>	Applications on stress and strain types, pins, bolts, plates, bars, structures, and joints.
<b>Week 4</b>	Safety factor concept.
<b>Week 5</b>	Torsion stress and strain, Solving examples and Quiz.
<b>Week 6</b>	Introduction to Shear and Bending moment diagram.
<b>Week 7</b>	Applications on Shear and Bending moment diagram.
<b>Week 8</b>	Mid-term Exam.
<b>Week 9</b>	Introduction on Bending stress.

<b>Week 10</b>	Applications on Bending stress.
<b>Week 11</b>	Introduction on Deflection on beams.
<b>Week 12</b>	Applications on Deflection on beams.
<b>Week 13</b>	Combined deflection and stress in beams
<b>Week 14</b>	Introduction on Thin cylinder
<b>Week 15</b>	Applications on Thin cylinder
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Introduction to strength of material laboratory.
<b>Week 2</b>	Lab 2: Tensile test.
<b>Week 3</b>	Lab 3: Compression test.
<b>Week 4</b>	Lab 4: Modulus of rigidity.
<b>Week 5</b>	Lab 5: Torsion test.
<b>Week 6</b>	Lab 6: Impact test.
<b>Week 7</b>	Lab 7: Bending and deflections of beam test.

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	MECHANICS OF MATERIALS, by Ferdinand P. Beer. And MECHANICS OF MATERIALS, by E. J. Hearn	No
<b>Recommended Texts</b>	Strength of Materials, by Ferdinand L.Singer	Yes
<b>Websites</b>	N/A	

### Grading Scheme

## مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Professional Ethics</b>		Module Delivery
Module Type	<b>Support</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>UREQ410</b>		
ECTS Credits	<b>2</b>		
SWL (hr/sem)	<b>50</b>		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr.Mahmud Rasheed Ismail	e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Assist Prof.Dr. Yasser Y Kahtan	e-mail	Yasser.yareb@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. التعرف على مفهوم لاخلاقيات المهنة</li><li>2. التعرف على المقومات الاساسية لاخلاقيات المهنة</li><li>3. التمييز بين مدونات السلوك للمهن المختلفة</li><li>4. التعرف على تاريخ انشاء المدونات وخاصة الهندسية</li><li>5. التعرف على اتاثير اخلاقيات المهنة على جودة العمل</li><li>6. التعرف على مدونة مهندسي الاطراف</li><li>7. التعرف على اهم متطلبات اخلاقيات البحث العلمي</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. التعريف باخلاقيات المهنة</li><li>2. التعرف على اهمية العمل ومقومات العمل الصالح وتميزه عن العمل الغير صالح</li><li>3. فهم اهمية اخلاقيات المهنة للمهندسين</li><li>4. الاطلاع على نشات وتنوع مدونات السلوك واسباب ذلك</li><li>5. التعرف على مدونات السلوك وبنودها للمنظمات الهندسية مثل ايت واسمي وغيرهما</li><li>6. التمييز بين مدونات المهندسين ومهن الطب والحقوق وغيرهما</li><li>7. التعرف على المدونة الخاصة بمهندسي الاطراف والمساند وحسب منظمة ISPO</li><li>8. التعرف على اخلاقيات البحث العلمي واخلاقيات عمل التجارب العلمية</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>المحتويات الارشادية كما يلي -</p> <p>مفهوم اخلاقيات المهنة وتعريفاته ومقوماته ( 2 ساعة )</p> <p>العمل ومقوماته وتنظيم العمل واللوائح ( 3 ساعة)</p> <p>اهمية ونشات مدونات السلوك للاطباء والحقوقين والمهندسين (5 ساعة )</p> <p>الفروقات بين مدونات المهن واسبابها (3 ساعة)</p> <p>بنود مدونة السلوك لمهندسي الاطراف والمساند والتوصيف الوظيفي (2 ساعة)</p> <p>اخلاقيات البحث العلمي ومقومات اخلاقيات التجارب على الانسان والحيوان والبيانات (5 ساعة )</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to develop students in 'Professional ethics and be familiar with codes of ethics especially for prosthetic and orthotic engineering .This will be achieved through classes, ,asking questions ,discussions in class and homework .</p>
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	30	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (15)	5, 10	LO #1,2, 4 and 5
	Assignments	4	15% (15)	2,4,6,8,	LO # 3,6,7 and
	Projects	-	-	-	-
	Report	1	10% (10)	14	LO # 8
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1- 5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عامة عن اخلاقيات المهنة
Week 2	المفهوم العام, المفهوم اللغوي, المفهوم الاصطلاحي
Week 3	اهمية العمل في حياة الانسان والمجتمع
Week 4	تنظيم العمل, عقد العمل, مراقبة العمل
Week 5	مقومات العمل, الامانة في العمل, الصدق والنصح, العدل, السماحة, التواضع, الحلم, الصبر

Week 6	الضمير, المصلحة, اللوائح والانظمة
Week 7	اخلاقيات المهنة الهندسية ,خصائصها وانواعها
Week 8	تاريخ المدونات الهندسية ,المدونات والمهن ومكوناتها
Week 9	اسباب تعدد مدونات السلوك و امثلة حول مدونات الطب والحقوق
Week 10	بنود مدونة منظمة ايت لقواعد سلوك المهندسين ,
Week 11	امثلة حول مدونات المهندسين ونشاتها مثل IEEE,ASME
Week 12	مدونة هندسة الاطراف الصناعية حسب منظمة ISPO
Week 13	اخلاقيات البحث العلمي
Week 14	اخلاقيات التعامل مع متطلبات البحث العلمي (بيانات الارشيف , المشاركون ,حيوانات التجارب.....الخ)
Week 15	قواعد تضارب المصالح في البحث العلمي
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	قواعد واخلاقيات ممارسة مهنة الهندسة – اعداد أ.د.نبيل عبد الرزاق جاسم- كلية الهندسة - جامعة البصرة – دار ومكتبة البصائر للطباعة والنشر والتوزيع	yes
Recommended Texts	اخلاقيات البحث العلمي – اعداد د. منى توكل السيد 2013	No
Websites	<a href="https://www.ispoint.org">https://www.ispoint.org</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>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing I		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CREQ110		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	09	College	03
Module Leader	Dr. Mustafa Saad Ayoob	e-mail	mustafa.saad@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Suzan Hassan Ahmed	e-mail	Suzanhassanbma@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Hayder Abbas Sallal	e-mail	Dr.hayder.A.S@nahrainuniv.edu.iq
Scientific Committee Approval Date	04/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	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	<ol style="list-style-type: none"><li>1. To understand the basic principles of engineering drawing</li><li>2. To have the knowledge of interpretation of dimensions of different quadrant</li></ol>

	<p>projections.</p> <ol style="list-style-type: none"> <li>3. To have the knowledge of generating the pictorial views</li> <li>4. Convert sketches to engineering drawings.</li> <li>5. Draw orthographic and isometric projections of solid objects.</li> <li>6. Familiarity with engineering drawing standards and practices.</li> <li>7. Prepare simple drawings as plan, elevation and section.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Identify and use the basic tools of engineering drawing.</li> <li>2. Sketch engineering components (lines, arches, polygons, isometries....etc.) using engineering drawing tools.</li> <li>3. Understand the theory of projection of solids.</li> <li>4. Understand the theory of projection of points.</li> <li>5. To enhance the prediction skills in finding missing projections.</li> <li>6. To Develop adequate prediction of hidden features.</li> <li>7. To find the true length of lines.</li> <li>8. Use the principles of orthographic projections.</li> <li>9. To understand and deal with various drawing dimensions.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Descriptive Engineering [15hrs] including:</u></p> <p>Basic projection planes, theory of projection of points [1hr]  Elevation and plan concepts, representing the projection of a point. [2hrs]  Traces of points, finding vertical and horizontal traces of a line. [2hrs]  Projection of lines on principal planes. [2hrs]  Finding true length of lines, using rabatment method. [3hrs]  Finding true length of lines using rotation method. [2hrs]  Exercises on finding missing coordinates of lines using their projections. [3hrs]</p> <p><u>Engineering hand drawing [35hrs] including:</u></p> <p>Familiarizing the students with basic engineering drawing tools, sheet types, fixing sheets before drawing and sheet layout. [3hrs]  Types of lines. [2hrs]  Basic drawing sketches. [4hrs]  Engineering drawing operations. [4hrs]  Projection of solids using free hand drawing. [4hrs]  Finding the missing projection of a drawing. [5hrs]  Projection of solids in scale drawing. [5hrs]  Adding dimensions to sketches. [4hrs]  Hidden lines of sketches. [4hrs]</p>

### Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to enhance student's skills in spatial perception. In this strategy, students play an active role, initially manually sketching and on the drawing board before proceeding to the computer. The other strategy was interleaving. This strategy involves practicing this module in more than one way. This includes performing drawings in different ways depending on the student understanding. Other strategies include encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials.</p>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	100	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6.7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	3, 6, 9	LO #3, 4, 7, 8
	<b>Assignments (Home works)</b>	13	15% (15)	2-14	LO # 1, 2, 5, 6, 9
	<b>Projects (class works)</b>	13	15% (15)	2-14	LO # 1, 2, 5, 6, 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-4, 7, 8
	<b>Final Exam</b>	3 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
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	Material Covered
Week 1	Introduction to drawing sheets, drawing tools + Introduction to Descriptive Engineering
Week 2	Sheet layout, types of lines + Theory of projection
Week 3	Basic drawing sketches + projection of a point + Quiz1
Week 4	Drawing operations part 1 + projection of a lines
Week 5	Drawing operations part 2 + traces of lines
Week 6	Projection of solids (free hand) + true length of lines + Quiz2
Week 7	Mid-term exam
Week 8	Projection of solids part 1 (scale) + Rabatment method
Week 9	Projection of solids part 2 (scale) + Rabatment method applications + Quiz 3
Week 10	Finding missing projection 1 + rotational method
Week 11	Finding missing projection 2 + finding missing coordinates 1
Week 12	Drawing hidden lines part 1 + finding missing coordinates 1
Week 13	Drawing hidden lines part 2
Week 14	Adding dimensions
Week 15	Adding dimensions
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

### Learning and Teaching Resources



مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Descriptive Geometry by : Dr. Yousef Nicola Engineering drawing by: Abdulrasool Al-Khazffaf	Yes
Recommended Texts	The Theory of Engineering Drawing by Alphonse Andrew Adler	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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Engineering Drawing II</b>		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>CREQ120</b>		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	09	College	03
Module Leader	Dr. Mustafa Saad Ayoob	e-mail	mustafa.saad@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Suzan Hassan Ahmed	e-mail	Suzanhassanbma@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Hayder Abbas Sallal	e-mail	Dr.hayder.A.S@nahrainuniv.edu.iq
Scientific Committee Approval Date	04/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CREQ110	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To understand the basic principles of transforming 2D hand engineering drawing to 3D CAD models.</li><li>2. To have the knowledge of interpretation of various CAD models.</li><li>3. To have the knowledge of generating model views using a computer</li><li>4. To have the ability to create 3D models for further analysis, production and design modification.</li><li>5. To have the ability to transform proposed designs into 3D models</li><li>6. Understand the underlying concepts of 3d modeling</li><li>7. to build confidence in 3D thinking.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. To learn the basics of transferring 2D sketches to 3D models.</li><li>2. Produce engineering drawings using a computer software.</li><li>3. Demonstrate competency with multiple drawing and modification commands in SolidWorks.</li><li>4. Develop sketching techniques.</li><li>5. Create three-dimensional solid models.</li><li>6. To have the knowledge of finding volume and mass of 3D objects.</li><li>7. To be able to create and deal with multiple planes.</li><li>8. Incorporate applied features and patterns into parts.</li><li>9. Produce 2D sketches from 3D models</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Introduction to 3D modelling using computer [ 2hr]</p> <p>Introducing SOLIDWORKS main screen, commands, file extensions, software capabilities, design tree, axes and unit system. [ 6hrs]</p> <p>Basic part, sketch tools and sketch entities. [ 7hrs]</p> <p>Sketch relations. [ 7hrs]</p> <p>Extruded boss and Extruded cut features. [ 7hrs]</p> <p>Pattern, fillet and chamfer features. [ 7hrs]</p> <p>Creating planes. [ 7hrs]</p> <p>Sweep and revolve features. [ 7hrs]</p> <p>2D drawing from 3D models. [ 7hrs]</p> <p>Dimensions and sheet configuration. [ 7hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is the students' task-based approach. In this approach, students will learn to start a 3D modelling task and finish the complete model. The other strategy was process following. This strategy encourages students to follow certain process steps to build a 3D model using solidworks. Other strategies include encouraging students' critical thinking and problem solving in 3D modelling were enhanced. This will be achieved through</p>
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	classes and interactive tutorials.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5.7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Projects (CW)	13	20% (20)	2-14	All
	Assignments(HW)	13	20% (20)	2-14	All
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to 3D modelling using computer
Week 2	SOLIDWORKS basics
Week 3	Sketch tools 1
Week 4	Sketch tools 1
Week 5	Sketch relations
Week 6	Extruded boss and extruded cut part 1

<b>Week 7</b>	Extruded boss and extruded cut part 2
<b>Week 8</b>	Pattern, fillet and chamfer features
<b>Week 9</b>	Adding material, calculating mass and volume
<b>Week 10</b>	Mid-term exam
<b>Week 11</b>	Planes features
<b>Week 12</b>	Sweep and revolve features part 1
<b>Week 13</b>	Sweep and revolve features part 2
<b>Week 14</b>	2D sketches, Dimensions and sheet configuration Part 1
<b>Week 15</b>	2D sketches, Dimensions and sheet configuration Part 2
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Fundamentals of 3D design and simulation by Dassault systems [available free online]	Yes
<b>Recommended Texts</b>	Beginner's Guide to SOLIDWORKS 2022 by SDC publications	No
<b>Websites</b>	All websites that provide relevant information about SOLIDWORKS	

## Grading Scheme

### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Pathology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER312		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dunya Khalaf hamad	e-mail	donia.khalaf@eng.naharinuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	M SC
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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>	<p>Introducing students to the mechanism of disease occurrence at the cellular level and how the cell responds to pathogens by means of adaptation and reform</p> <p>2. Studying the causes and pathogenesis of various diseases at the level of each organ</p> <p>The body separately and its reflection on the function of the affected organ and other organs associated with it</p> <p><b>Systemic pathology</b></p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Providing students with the latest scientific developments related to pathology</li><li>2. Focusing on the most common diseases in the Iraqi environment</li><li>3. Introducing students to the methods of conducting pathological analyzes to reach a pathological diagnosis.</li><li>4. Introduce the student to how to understand the course of the disease and its diagnosis.</li><li>5. Introducing students to how to link pathological diagnoses with clinical signs in order to find appropriate means for treatment</li></ol> <p>b- The soft skills objectives of the course.</p> <ol style="list-style-type: none"><li>5 - Teach the student how to make and examine histological slides</li><li>6 - Teach the student how to make and examine blood smears and cell smears</li></ol> <p>7- Using electronic means in teaching and discussion (cameras, data projectors, and the blackboard).</p> <p>electronic (</p> <ol style="list-style-type: none"><li>8- Using online communication programs (Model) to transfer lectures and questionnaires</li><li>9. Understanding the methods of research, recitation, discussion, and the development of intellectual abilities</li><li>5. Enabling students to obtain knowledge and understanding of the intellectual and skill framework</li><li>10. Enabling students to obtain knowledge and understanding of the ethics of the student's profession</li><li>11. Enable students to obtain knowledge and understanding of anatomy</li><li>12. Learn dialogue and discussion</li><li>13. The ability to work together and the ability to deliver and present and to use the computer and the Internet</li><li>14. Understanding and knowing the functions of the members accurately and knowing the pathological conditions to reach the correct diagnosis</li><li>.15 Studying health problems and their impact on the health and effectiveness of</li></ol>



	<p>members.</p> <p>16 Knowledge of blood, blood and serological tests to help diagnose diseases</p> <p>17. Evaluating and analyzing the different methods of infection control and determining the most appropriate for each disease case B3</p> <p>18. Evaluation of all pharmacological treatments, whether indicative or applied</p> <p>19 . The ability to think scientifically and the ability to imitate creativity The ability to interpret scientific phenomena, workshops and activities The ability to invent new scientific methods for treatments and put forward new ideas</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>Indicative content</b> Perinatal development, genetic influences, physiological adaptations at birth and homeostasis. Normal anatomy and physiology of major body systems Concepts of disease processes Physiology and pathophysiology of diseases and systems</p> <p>This module is delivered over one academic term. The above skills acquisition, contributes to the development of the <b>UWS Graduate Attributes : Universal</b> - critical thinking, analytical, inquiring, collaborative, research-minded and socially responsible; <b>Work Ready</b> - knowledgeable, digitally literate, effective communicator, motivated, potential leader; and <b>Successful</b> - autonomous, incisive, creative, resilient and daring.</p> <ul style="list-style-type: none"> <li>• Enhance students understanding of anatomy and physiology of major body systems</li> <li>• Enhance students understanding of the pathological processes in common conditions</li> <li>• To enable enhance understanding of the relevance of findings from clinical examination</li> </ul>

<p style="text-align: center;"><b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>Giving lectures in the form of Power Point, showing educational films, using plaster and plastic models, various anatomical sections of the brain, X-ray and magnetic resonance films, and student participation during discussions during teaching in small groups in practical laboratories</p> <p>Students' participation in interactive lectures in theoretical and practical lessons</p> <p>Lectures with discussions.</p> <ol style="list-style-type: none"> <li>1.White seborh</li> <li>2.Projector device</li> <li>3. Students participate in small groups</li> <li>4. Students' interactive participation during the lecture</li> <li>5. Using computers and the Internet to keep communicating with the progress of scientific knowledge in human anatomy</li> </ol>

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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3.6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	10	20 % (20)	2,3,4,6,8,9,11 12,13 14	LO #14-15-16-17-18-19
	<b>Assignments</b>	-	-	-	-
	<b>Projects / Lab.</b>	-	-	-	-
	<b>Report /seminar</b>	1	20% (20)	13	LO # 9-10-11-12-13
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	5.10	LO # 1-2-3-4-5-6-7-8
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
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	<b>Material Covered</b>
<b>Week 1</b>	Introduction to pathology, Etiology, pathogenesis, morphological changes& clinical significance, Tissue Processing to diagnostic the pathology.
<b>Week 2</b>	Biopsy, types general rules for taking the Biopsy. Skeletal connective tissue , Cartilage types of cartilage ,
<b>Week 3</b>	Bone: components matrix & cells , Bone mineralization
<b>Week 4</b>	Development of an osteon , intramembranous ossification , endochondral ossification , epiphyseal growth plate
<b>Week 5</b>	Cell injury, Mechanisms for cell injury, Causes of Cell Injury, Morphological changes follow functional changes
<b>Week 6</b>	SEMINARS
<b>Week 7</b>	FIRST MID TERM EXAM
<b>Week 8</b>	Types of Cell Death: Apoptosis & Necrosis ; Types , Mechanisms
<b>Week 9</b>	Cellular Adaptation, Types of cellular adaptation. & Neoplasia
<b>Week 10</b>	Inflammation; acute & chronic , Histologic chronic inflammation
<b>Week 11</b>	Formation of acute inflammation& repair
<b>Week 12</b>	SEMINARS
<b>Week 13</b>	Bone cancer, Primary Bone Cancer, Secondary Bone Cancer, Bone Cancer Risk Factors, Bone Cancer Symptoms, Diagnosis, Treatment, Paget's disease, Symptoms, Diagnosis, Treatment
<b>Week 14</b>	SECOND MID TERM EXAM
<b>Week 15</b>	Introduction to pathology, Etiology, pathogenesis, morphological changes& clinical significance, Tissue Processing to diagnostic the pathology.
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>
	Orthopedic pathology, Osteomyelitis, Development of Osteomyelitis, Risk factors, Causes, Symptom diagnosis,, Treatment
	FIBROUS DYSPLASIA , Complications , Causes, Symptom ,diagnosis, ,Chondrosarcoma, COMMON SITES, Causes, Symptom, Medical diagnosis
	patellar-tendon-rupture, Causes, Symptom, diagnosis, Treatment, AVASCULAR NECROSIS, Symptoms, Causes, diagnosis, Treatment, Osteoporosis Causes, Symptom
	Osteoporosis, Risk factors, Causes, Symptom diagnosis,, Treatment ,Rickets & Osteomalacia ,Risk factors, Causes, Symptom diagnosis,, Treatment, OSTEOCHONDROMA,, Risk factors, Causes, Symptom diagnosis,, Treatment .
	Factors Affecting Bone Growth, Bone Remodeling, Bone Deposition, Hormonal Mechanism, Calcium Homeostasis & Bone Tissue, Fractures, Fractures (type & shape), and Fracture Repair.
	Gout, Causes, Symptom diagnosis, Treatment, Pseudogout, Causes, Symptom diagnosis, Treatment
	Baker's cyst, Causes, Symptom diagnosis, Treatment, OSTEOARTHRITIS, Causes, Symptom diagnosis, Treatment, Pathogenesis
	Slipped capital femoral epiphysis, Causes, Symptom diagnosis, Treatment.
	CLUBFOOT, Complications, Causes, Symptom diagnosis, Treatment, Flat feet, Causes, Symptom diagnosis, Treatment, Pathogenesis

	GENU VARUM, Causes, Symptom diagnosis, Treatment, Pathogenesis, GENU VALGUS, Causes, Symptom diagnosis, Treatment, Pathogenesis,
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<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> <li>-Pathology of Textbook Muirs-</li> <li>-Robbins Basic Pathology</li> <li>-Textbook PATHOLOGY Postgraduate Hoffbrand- -</li> <li>-Koss Diagnostic Cytopathology Textbook</li> <li>- Sternberq Surgical Pathology</li> <li>-Williams Hematology –</li> <li>British Journal of Pathology –</li> <li>Human Pathology Pournal</li> </ul>	Yes

Recommended Texts		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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biology		Module Delivery
Module Type	Basic learning activities		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CREQ111		
ECTS Credits	6.00		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dunya Khalaf hamad	e-mail	donia.khalaf@eng.naharinuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	M SC
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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>	<p>The course aims to introduce students to one of the main branches, which is molecular biology, which is concerned with studying Molecular nature of macromolecules, proteins, DNA, RNA and related biological information. It includes an introduction and a brief history of the development of molecular biology, a full understanding of cell functions Molecular level in primitive and eukaryotic cells, types of nucleic acids and their chemical composition, characteristics Characteristics of DNA and RNA, discovering the role of the genetic code, gene expression (cloning) And the basic steps in cloning and the enzymes responsible for cloning in primitive and eukaryotic cells. Translation in prokaryotes and eukaryotes, types of functional and structural proteins, types of RNA, regulation of gene expression in primitive and eukaryotic cells. Genetic mutations, types and mechanisms of repairing damage in DNA. entrance to <b>Genetic Engineering.</b></p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1 Definition of molecular biology and its relationship to other branches of life sciences.</li><li>2 Historical overview of the development of molecular biology</li><li>3 Studying the structure of DNA, how it is organized inside eukaryotic and prokaryotic cells, and the mechanisms of its replication.</li><li>4 Studying the structure and types of RNA and how to transcribe it</li><li>5 Gene expression, translation mechanisms, and protein formation</li><li>6 genetic mutations</li><li>B - The soft skills objectives of the course</li><li>7 - Introducing students to the means of extracting nucleic acids from different laboratory samples.</li><li>8 - Using modern techniques to detect the quantities and concentrations of RNA &amp; DNA</li><li>9 - Provide the student with the skill of applying modern technologies in laboratories and hospitals.</li><li>10. Studying cellular activities at the molecular level and methods of detection.</li></ol>

	<p>.11. Understanding the methods of research, recitation, discussion, and the development of intellectual abilities</p> <p>12. Enabling students to obtain knowledge and understanding of the intellectual and skill framework</p> <p>13. Enabling students to obtain knowledge and understanding of the ethics of the student's profession</p> <p>14. Enable students to obtain knowledge and understanding of anatomy</p> <p>15. Learn dialogue and discussion</p> <p>16 The ability to work together and the ability to deliver and present and to use the computer and the Internet</p> <p>.17 Understanding and knowing the functions of the members accurately and knowing the pathological conditions to reach the correct diagnosis</p> <p>.18. Studying health problems and their impact on the health and effectiveness of members.</p> <p>19 Knowledge of blood, blood and serological tests to help diagnose diseases</p> <p>20. Evaluating and analyzing the different methods of infection control and determining the most appropriate for each disease case B3</p> <p>21. Evaluation of all pharmacological treatments, whether indicative or applied</p> <p>22. The ability to think scientifically and the ability to imitate creativity The ability to interpret scientific phenomena, workshops and activities The ability to invent new scientific methods for treatments and put forward new ideas</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>indicative content</b> Perinatal development, genetic influences, physiological adaptations at birth and homeostasis. Normal anatomy and physiology of major body systems Concepts of disease processes Physiology and pathophysiology of diseases and systems</p> <p>This module is delivered over one academic term. The above skills acquisition, contributes to the development of the <b>UWS Graduate Attributes : Universal</b> - critical thinking, analytical, inquiring, collaborative, research-minded and socially responsible; <b>Work Ready</b> - knowledgeable, digitally literate, effective communicator, motivated, potential leader; and <b>Successful</b> - autonomous, incisive, creative, resilient and daring.</p> <ul style="list-style-type: none"> <li>• Enhance students understanding of anatomy and physiology of major body systems</li> <li>• Enhance students understanding of the pathological processes in common conditions</li> <li>• To enable enhance understanding of the relevance of findings from clinical examination</li> </ul>



## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>Giving lectures in the form of Power Point, showing educational films, using plaster and plastic models, various anatomical sections of the brain, X-ray and magnetic resonance films, and student participation during discussions during teaching in small groups in practical laboratories</p> <p>Students' participation in interactive lectures in theoretical and practical lessons</p> <p>Lectures with discussions.</p> <ol style="list-style-type: none"> <li>1.White seborh</li> <li>2.Projector device</li> <li>3. Students participate in small groups</li> <li>4. Students' interactive participation during the lecture</li> <li>5. Using computers and the Internet to keep communicating with the progress of scientific knowledge in human anatomy</li> </ol>
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5.7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	7	15 % (15)	2,3,4,6,8,9,11	LO # 17-18-19-20-21-22
	Assignments	-	-	-	-
	Projects / Lab.	1	15% ( 15)	Continuous	All
	Report / seminar	1	10% (10)	13	LO # 11-12-13-14-15-16
Summative assessment	Midterm Exam	2 hr	10% (10)	5.10	LO # 1-2-3-4-5-6-7-8-9-10
	Final Exam	2hr	50% (50)	16	All
<b>Total assessment</b>			<b>100% (100 Marks)</b>		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
Week 1	➤ <b>Introduction to biology</b> The defining of Biology & Cytology, The meaning of a Cell, Levels of biological Organization, Characteristics of living cells or organisms, symbiotic relationships, The important of Biology for us
Week 2	➤ <b>Prokaryotic &amp; Eukaryotic cells</b> The meaning of eukaryotic and prokaryotic cell, The Difference between Prokaryotic and Eukaryotic cell, <b>Microscope</b> , The structure and important of A microscope, How it works, The types of A microscope
Week 3	➤ <b>Structural organization Cell</b> Cell organelles, Nucleus, Mitochondria, Endoplasmic Reticulum, Ribosomes, Golgi complex, Lysosomes, Peroxisomes or Microbodies
Week 4	➤ <b>Plasma membrane structure ,function and their junctions</b>
Week 5	<b>FIRST MID TERM EXAM</b>

Week 6	Cell movement& Locomotion, basic mechanisms of cellular locomotion, Cells Junction, transport of large molecules such as Polysaccharides or Polynucleotide
Week 7	Introduction Genetics ,Cellular differentiation ➤
Week 8	Cellular Division (Mitosis),Cellular Division (Meiosis), Mutation

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	-The cell and molecular biology. By Karp .2014 Biology a global approach.11th edition.by Campbell, Urry, Cain, Wasserman, Minorsky and Reece.2017	Yes

<b>Recommended Texts</b>		No
<b>Websites</b>		

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Analytical Biomechanics</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER323		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	09	College	03
Module Leader	Dr.Mahmud Rasheed Ismail	e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Assist Prof.Dr. Yasser Y.Kahtan	e-mail	yasser.kahtan@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	POER221	Semester	4
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To perform motion analysis using different methods</li><li>2. To compute parameters of human body segments</li><li>3. To analysis kinematics of human movements</li><li>4. To analysis kinetics of human segments</li><li>5. To modeling human body for different activities</li><li>6. To analysis biomechanics of amputation</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Developing skills in analyzing motion using graphical and numerical methods</li><li>2. Performing video analysis using video motion tools</li><li>3. Computing physical and mechanical properties of human body segments</li><li>4. Learning the lump analysis for kinematic of movements</li><li>5. Modeling of human body dynamics</li><li>6. Calculating power and energy of human due to walking and other movements</li><li>7. Performing impulse analysis of human impact</li><li>8. Skills in design of prosthesis socket</li><li>9. Applying biomechanics skills for different types of amputees and deformity</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Basic definitions and graphical and analytical analysis of motion [6 hrs]</p> <p>Video motion analysis using key images and central difference methods with solved problems [6 hrs]</p> <p>Human body segment parameters calculation using anthropometry tables for single segment and multi segments with applications of solving problems [6 hrs]</p> <p>Lump analysis and kinematics of human movements [7 hrs]</p> <p>Planner motion of human body segments and dynamic analysis with solved problems [8 hrs]</p> <p>Work ,energy and power calculations of human walking and other daily activities [6 hrs]</p> <p>Biomechanics of lower limbs and upper limb and stump ,force anlalysis of socket and orthosis ,design of socket for comfort[7 hrs] ..</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to develop students in Biomechanics skills and be familiar with analyzing kinematics and kinetic of human motion for normal and amputees .This will be achieved through classes, discussions ,asking questions , and solving samples of problems in class and homework .as well as practical skills due to performing experiments in labs .
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4.8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
<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	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6and 9
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 8 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

## المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Motion Analysis Graphical method
<b>Week 2</b>	Motion Analysis Analytical method
<b>Week 3</b>	Human Body Segment Parameters and Anthropometry
<b>Week 4</b>	The Lump analysis Method I
<b>Week 5</b>	The Lump analysis Method II
<b>Week 6</b>	Planner Analysis Method I
<b>Week 7</b>	Planner Analysis Method II
<b>Week 8</b>	Internal Forces and physical stress
<b>Week 9</b>	Impulse and Momentum and Crash Mechanics
<b>Week 10</b>	motion analysis computer software (KINOVEA)
<b>Week 11</b>	Biomechanics of amputee
<b>Week 12</b>	Biomechanics of socket
<b>Week 13</b>	Biomechanics of Bracing and Orthosis
<b>Week 14</b>	Biomechanics devices and instrumentation
<b>Week 15</b>	Gait analysis
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Measuring of human joint angles and ROM
<b>Week 2</b>	Video motion analysis using treadmill
<b>Week 3</b>	Measuring of human body mass center
<b>Week 4</b>	Anthropometry of human body
<b>Week 5</b>	Measuring of human gait cycle parameters
<b>Week 6</b>	
<b>Week 7</b>	



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Human Body Dynamics Classical Mechanics and Human Movement, Aydın Tözeren,2010	yes
Recommended Texts	1. Dynamics of human gait ,2ed,Brain L Davis,2009 2. Fundamental of Biomechanics ,2 ed, Duane Knudson ,2015	No
Websites	<a href="https://isbweb.org">https:// isbweb.org</a>	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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<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>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Rehabilitation		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER313		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dunya Khalaf hamad	e-mail	donia.khalaf@eng.naharinuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	M SC
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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>	<p>A- Cognitive goals</p> <ol style="list-style-type: none"><li>1. Helping students to know the methods of teaching and learning that help them achieve the intended learning outcomes in theory.</li><li>2. Helping students to know the assessment methods used to ensure that students obtain the learning outcomes targeted.</li><li>3. Helping students to know the relationship of the program and its study elements (courses or subjects) with Certificate awarded and future job qualifications.</li></ol> <p>b- The program's Marathi objectives</p> <ol style="list-style-type: none"><li>1 - Helping students apply what they have learned from practical materials inside and outside the university setting.</li><li>2 - Helping students apply what they have learned from theoretical subjects inside and outside the university setting.</li><li>3 - Helping students apply their ideas and talents inside and outside the university setting</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>-1 Helping students to know the methods of teaching and learning that help them achieve the intended learning outcomes in theory.</li><li>2 Helping students to know the assessment methods used to ensure that students obtain the learning outcomes targeted.</li><li>-3 Helping students to know the relationship of the program and its study elements (courses or subjects) with Certificate awarded and future job qualifications.</li></ol> <p>b- The program's Marathi objectives</p> <ol style="list-style-type: none"><li>4- Helping students apply what they have learned from practical materials inside and outside the university setting.</li><li>5 - Helping students apply what they have learned from theoretical subjects inside and outside the university setting.</li><li>6- Helping students apply their ideas and talents inside and outside the university setting.</li><li>7. Understanding the methods of research, recitation, discussion, and the development of intellectual abilities</li><li>8. Enabling students to obtain knowledge and understanding of the intellectual and skill framework</li></ol>

	<p>9 Enabling students to obtain knowledge and understanding of the ethics of the student's profession</p> <p>10. Enable students to obtain knowledge and understanding of anatomy</p> <p>11. Learn dialogue and discussion</p> <p>12 The ability to work together and the ability to deliver and present and to use the computer and the Internet</p> <p>13. Understanding and knowing the functions of the members accurately and knowing the pathological conditions to reach the correct diagnosis</p> <p>.14. Studying health problems and their impact on the health and effectiveness of members.</p> <p>15. Knowledge of blood, blood and serological tests to help diagnose diseases</p> <p>16 . Evaluating and analyzing the different methods of infection control and determining the most appropriate for each disease case B3</p> <p>17 . Evaluation of all pharmacological treatments, whether indicative or applied</p> <p>18 . The ability to think scientifically and the ability to imitate creativity The ability to interpret scientific phenomena, workshops and activities The ability to invent new scientific methods for treatments and put forward new ideas</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>Indicative content</b></p> <p>1- Showing the personality of the student in a way that works to develop it.</p> <p>-2 Increasing the student's self-confidence.</p> <p>-3 Highlighting the students' hidden talents.</p>

<p style="text-align: center;"><b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>1 helps to use deductive reasoning processes more.</p> <p>2 Contribute to raising the level of academic achievement for students.</p> <p>3Develop positive relationships, and help the individual to accept the points of view of others.</p> <p>4. Stimulate the motivation of learners.</p> <p>5. Help to form better positive attitudes towards the school and teachers.</p> <p>6. Achieve a higher self-esteem.</p> <p>7. It helps the student to adapt positively psychologically and socially</p>

<p style="text-align: center;"><b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</p>	
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<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	7	15 % (15)	2,3,4,6,8,9,11	LO # 13-14-15-16-17-18
	<b>Assignments</b>	-	-	-	-
	<b>Projects / Lab.</b>	1	15% ( 15)	<b>Continuous</b>	<b>All</b>
	<b>Report / seminar</b>	1	10% (10)	13	LO # 7-8-9-10-11-12
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	5.10	LO # 1-2-3-4-5-6
	<b>Final Exam</b>	2hr	50% (50)	16	<b>All</b>
<b>Total assessment</b>			<b>100% (100 Marks)</b>		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	<b>Introduction to Rehabilitation,</b> Principles of rehabilitation, Rehabilitation Goals, health definition, Rehabilitation program, conditions that need rehabilitation, Impairment, disability, handicap.
<b>Week 2</b>	<b>General of Rehabilitation</b> Physiotherapist, Type of Rehabilitation ( more than 25 types), <ul style="list-style-type: none"> <li>Physical, Pediatric, Geriatric, Psychological, Brain Injury rehabilitation</li> <li>rehabilitation for Neurological, Signs of Stroke, what conditions may benefit from neurological rehabilitation, what conditions can benefit from musculoskeletal rehabilitation,</li> <li>Cardiac rehab program (Steps of mobilization, Stop Exercise, what are the Warning Signs of Heart Attack and Stroke, Benefits of Cardiac Rehab)</li> <li>Rehabilitation Team</li> </ul>
<b>Week 3</b>	<b>Exercise and Rehabilitation</b>

	<ul style="list-style-type: none"> <li>• Exercise and Rehabilitation, stages exercises, Benefits of exercise,</li> <li>• Treatment modalities used in Physical Medicine, Cold therapy, Heat therapy, Microwave therapy, ultra-sound, massage, Infra-red ray, Ultra-VOLIT, Hydrotherapy</li> <li>• Flexibility, Thigh Stretches, Back Stretches, Sprain</li> </ul>
<b>Week 4</b>	<b>Fractures Rehabilitation + link movie Exercise</b> <ul style="list-style-type: none"> <li>• Fractures, Type of Fracture, Fixator Fracture, External fixator, Intramedullary fixation, Wires, Pins, Plates ,rods</li> <li>• Physiotherapy for fractures of the upper limb, Hand Rehabilitation</li> </ul>
<b>Week 5</b>	FIRST MID TERM EXAM
<b>Week 6</b>	<b>Hip Fractures Rehabilitation + link movie Exercise</b> <ul style="list-style-type: none"> <li>• Weight bearing depending on union of fracture in lower limb, Rehabilitation fractured tibia and fibula, the triceps surae,</li> <li>• Neuromuscular control,</li> <li>• Proximal Hip Fractures &amp; Rehabilitation</li> </ul>
<b>Week 7</b>	<b>Amputation Rehabilitation</b> <ul style="list-style-type: none"> <li>• Amputation, Causes, Cases requiring amputation, what level of amputation will need?</li> <li>• sock, Tips and Advice of The sock,</li> <li>• Phantom Limb, Information, Phantom Limb causes, Control phantom pain,</li> <li>• Mirror Therapy</li> <li>• psychological and emotional impact of amputation</li> </ul>
<b>Week 8</b>	<b>(below knee) Rehabilitation + link movie Exercise</b> Physiotherapy exercises following transtibial (below knee) amputation.
<b>Week 9</b>	SECOND MID TERM EXAM
<b>Week 10</b>	<b>Above knee) Rehabilitation + link movie Exercise</b> Physiotherapy exercises following transtibial (Above knee) amputation.
<b>Week 11</b>	<b>Arm Rehabilitation.</b> Physiotherapy exercises following transtibial (below elbow) amputation
<b>Week 12</b>	<b>Pediatric Rehabilitation + Geriatric Rehabilitation</b> <ul style="list-style-type: none"> <li>• Geriatric Rehabilitation, Physiology of normal aging Body composition, Risk factors for falls, Strategies for reducing risks of falls,</li> <li>• Pediatric Rehabilitation Medicine, Conditions Treated, Neuro Rehabilitation and Robotics</li> </ul>
<b>Week 13</b>	<b>Introduction to Rehabilitation,</b> Principles of rehabilitation, Rehabilitation Goals, health definition, Rehabilitation program, conditions that need rehabilitation, Impairment, disability, handicap.
<b>Week 14</b>	<b>General of Rehabilitation</b> Physiotherapist, Type of Rehabilitation ( more than 25 types), <ul style="list-style-type: none"> <li>• Physical, Pediatric, Geriatric, Psychological, Brain Injury rehabilitation</li> <li>• rehabilitation for Neurological, Signs of Stroke, what conditions may benefit from neurological rehabilitation, what conditions can benefit from musculoskeletal rehabilitation,</li> <li>• Cardiac rehab program (Steps of mobilization, Stop Exercise, what are the Warning Signs of Heart Attack and Stroke, Benefits of Cardiac Rehab)</li> <li>• Rehabilitation Team</li> </ul>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Measurement Flexion of Shoulder joint
Week 2	Measurement Extension of Shoulder joint
Week 3	Measurement lateral rotation of Shoulder joint
Week 4	Measurement Medial rotation of Shoulder joint.
Week 5	Measurement Abduction of Shoulder joint.
Week 6	Measurement Flexion of Elbow joint.
Week 7	Measurement Extension of Elbow joint
Week 8	Measurement Extension of Wrist joint.
Week 9	Measurement Flexion of Wrist joint.
Week 10	Measurement Pronation of Wrist joint
Week 11	Measurement Supination of Wrist joint
Week 12	Measurement ulnar deviation(abduction) of Wrist joint.

<b>Week 13</b>	Measurement radial deviation(adduction) of Wrist joint.
<b>Week 14</b>	Measurement Flexion of knee joint.
<b>Week 15</b>	Measurement extension of knee joint.

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>-Text book of Rehabilitation Medicine by Howard, A.Rusk</li> <li>_ Physical Medicine and Rehabilitation- Braddom R L</li> <li>_ Muscle Testing and Function - Kendall F.P</li> <li>_ Hutchison’s Clinical Methods- Swash M</li> <li>_ Sports Injury Assessment and Rehabilitation- Reid, David.C</li> <li>_ Therapeutic Exercises - Basmajian</li> <li>_ Kelly’s Text book of Rheumatology- Ruddy, Harris and Sledge</li> <li>_ Medical Ethics –Schwartz</li> <li>_ Spinal Cord Medicine –Denise J C, Delisa J</li> <li>_ Physiological Basis of Rehabilitation Medicine- Downey and Darling</li> <li>_ The Physiology of the Joints, Vol. I, II, III- Kapandji.I.A</li> <li>_ Exercise and the Heart- Froelicher and Myers</li> <li>_ Turek’s Orthopaedics: Principles and Applications- Weinstein S L, Buckwalter J</li> </ul>	Yes
<b>Recommended Texts</b>		No
<b>Websites</b>		

**Grading Scheme**



## مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Anatomy</b>		Module Delivery
Module Type	<b>Core</b>		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER210</b>		
ECTS Credits	<b>6.00</b>		
SWL (hr/sem)	<b>150</b>		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dunya Khalaf hamad	e-mail	donia.khalaf@eng.naharinuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	M SC
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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. The aim of this module is to enable the student to develop an understanding of the structure, location and function of the systems of the human body and their relationship to each other.</li> <li>2. Knowledge of the natural structure, organs and internal structures of the human body and their locations and connections</li> </ol> <p>Through anatomy and other means such as gypsum and plastic models and showing educational films / X-rays and magnetic resonance imaging</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. learning achievements for students, stating what it is the student should be able to demonstrate at the end of a period of learning. Module level learning outcomes should be capable of being assessed and easily understood by the student</li> <li>2. Teaching and learning the superficial anatomical signs of the body that indicate the locations of bones and muscles Tendons, blood vessels, nerves and other internal organ</li> <li>3. To link basic anatomy a with manifestations of pathological conditions to reach a diagnosis the correct</li> <li>4. Understanding the methods of research, recitation, discussion, and the development of intellectual abilities</li> <li>5. Enabling students to obtain knowledge and understanding of the intellectual and skill framework</li> <li>6. Enabling students to obtain knowledge and understanding of the ethics of the student's profession</li> <li>7. Enable students to obtain knowledge and understanding of anatomy</li> <li>8. Learn dialogue and discussion</li> <li>9. The ability to work together and the ability to deliver and present and to use the computer and the Internet</li> <li>10. Understanding and knowing the functions of the members accurately and knowing the pathological conditions to reach the correct diagnosis</li> <li>.11. Studying health problems and their impact on the health and effectiveness of members.</li> <li>12 Knowledge of blood, blood and serological tests to help diagnose diseases</li> <li>13. Evaluating and analyzing the different methods of infection control and determining the most appropriate for each disease case B3</li> <li>14. Evaluation of all pharmacological treatments, whether indicative or applied</li> <li>15. The ability to think scientifically and the ability to imitate creativity The ability to interpret scientific phenomena, workshops and activities The ability to invent new scientific methods for treatments and put forward new ideas</li> </ol>
<p><b>Indicative Contents</b></p>	<p>ndicative content</p>

<p>المحتويات الإرشادية</p>	<p>Perinatal development, genetic influences, physiological adaptations at birth and homeostasis.  Normal anatomy and physiology of major body systems  Concepts of disease processes  Physiology and pathophysiology of diseases and systems</p> <p>This module is delivered over one academic term.  The above skills acquisition, contributes to the development of the <b>UWS Graduate Attributes : Universal</b> - critical thinking, analytical, inquiring, collaborative, research-minded and socially responsible; <b>Work Ready</b> - knowledgeable, digitally literate, effective communicator, motivated, potential leader; and <b>Successful</b> - autonomous, incisive, creative, resilient and daring.</p> <ul style="list-style-type: none"> <li>• Enhance students understanding of anatomy and physiology of major body systems</li> <li>• Enhance students understanding of the pathological processes in common conditions</li> <li>• To enable enhance understanding of the relevance of findings from clinical examination</li> </ul>
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<p style="text-align: center;"><b>Learning and Teaching Strategies</b>  استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>Giving lectures in the form of Power Point, showing educational films, using plaster and plastic models, various anatomical sections of the brain, X-ray and magnetic resonance films, and student participation during discussions during teaching in small groups in practical laboratories  Students' participation in interactive lectures in theoretical and practical lessons  Lectures with discussions.</p> <ol style="list-style-type: none"> <li>1.White seborh</li> <li>2.Projector device</li> <li>3. Students participate in small groups</li> <li>4. Students' interactive participation during the lecture</li> <li>5. Using computers and the Internet to keep communicating with the progress of scientific knowledge in human anatomy</li> </ol>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	100	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6.6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	7	15 % (15)	2,3,4,6,8,9,11	LO # 10,11,12,13,14,15
	<b>Assignments</b>	-	-	-	-
	<b>Projects / Lab.</b>	1	15% ( 15)	<b>Continuous</b>	<b>All</b>
	<b>Report / seminar</b>	1	10% (10)	13	LO # 4,5,6,7,8,9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	5.10	LO # 1-2-3
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			<b>100% (100 Marks)</b>		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction to anatomy Descriptive anatomy, skin, fascia, bones
<b>Week 2</b>	Muscles & Joints
<b>Week 3</b>	Blood & Lymph vessels Radiological Anatomy Bones of the shoulder region

<b>Week 4</b>	Joints of shoulder girdle & its muscles
<b>Week 5</b>	Mid-Term Theoretical Exam
<b>Week 6</b>	Arm bones & Muscles axilla & brachial plexus
<b>Week 7</b>	Forearm bones & muscles Elbow joint & Cubital fossa
<b>Week 8</b>	Skeleton & Structure of the hand (Bones, Joints & muscles)
<b>Week 9</b>	The hip bone, The gluteal region (Muscles origin, action, insertion, Blood supply, nerve supply)
<b>Week 10</b>	Femur bone& (Muscles, origin, action, insertion, Blood supply, nerve supply)
<b>Week 11</b>	Knee joint & popliteal fossa
<b>Week 12</b>	Mid-Term Theoretical Exam
<b>Week 13</b>	the leg tibia and fibula (Muscles, 5 origin, action, insertion, Blood supply, nerve supply)
<b>Week 14</b>	The Foot (Bone & Muscles)
<b>Week 15</b>	Ankle joint & arches of the foot
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Introduction to anatomy Descriptive anatomy, skin, fascia, bones
<b>Week 2</b>	Muscles & Joints
<b>Week 3</b>	Blood & Lymph vessels Radiological Anatomy Bones of the shoulder region
<b>Week 4</b>	Joints of shoulder girdle & its muscles
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<b>Week 6</b>	Arm bones & Muscles axilla & brachial plexus
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<b>Week 10</b>	Femur bone& (Muscles, origin, action, insertion, Blood supply, nerve supply)
<b>Week 11</b>	Knee joint & popliteal fossa
<b>Week 12</b>	Mid-Term Theoretical Exam
<b>Week 13</b>	the leg tibia and fibula (Muscles, 5 origin, action, insertion, Blood supply, nerve supply)
<b>Week 14</b>	The Foot (Bone & Muscles)

<b>Week 15</b>	Ankle joint & arches of the foot

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Clinical Anatomy by regions. Richards Snell.eighth edition. 2-Clinical Neuroanatomy. Richards Snell. seventh edition	Yes
<b>Recommended Texts</b>		No
<b>Websites</b>		

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Prosthetic Clinical Practice</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER410</b>		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Hayder abbas sallal	e-mail	Dr.hayder.A.S@ nahrainuniv.edu.iq
Module Leader's Acad. Title	lecture	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	----
Peer Reviewer Name	-----	e-mail	-----
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Prostheses I , Prostheses II	Semester	3 , 5
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 skills in the Prosthetics Clinical Phase.</li><li>2. To understand the Prosthetics Clinical Phase.</li><li>3. This course deals with the basic concept of the Prosthetics Clinical Phase.</li><li>4. This is the basic subject for all types of the Amputations, First Aid, Wound repair, Pressure ischemia, Hospital administration and Vascular clinic.</li><li>5. To understand Patient Handling.</li><li>6. To perform Postsurgical Management.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize how Prosthetics Clinical Phase.</li><li>2. Discuss the Postsurgical Management.</li><li>3. Describe of the Prosthetic Component.</li><li>4. Identify Other Levels of Amputation and Upper Extremity Amputations.</li><li>5. Identify Clinical Decision-Making for Prosthetics.</li><li>6. Identify Patient Handling</li><li>7. Identify Wound repair.</li><li>8. Explain the Hospital administration</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Introduction to the Prosthetics Clinical Phase Psychosocial Issues With definitions, enumerations, and graphics. [15 hrs]</p> <p>Amputation Surgery of the Lower Extremity, Postsurgical Management, Prosthetic Components. [15 hrs]</p> <p>Other Levels of Amputation and Upper Extremity Amputations, Clinical Decision-Making for Prosthetics. [15 hrs]</p> <p>The Child with an Amputations. [5 hrs]</p> <p>Patient Handling [6 hrs]</p> <p>First Aid, Wound repair, Pressure ischemia. [15 hrs]</p> <p>Hospital administration, Vascular clinic. [15 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' Participate in presentations in the form of a seminar, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, Practical lessons and theoretical lectures.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	114	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

## 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, 2, 3,7,8 and 9
	<b>Assignments</b>	2	15% (15)	2, 12	LO # 4,5,10 and 11
	<b>Projects / Lab.</b>	-	-	Continuous	All
	<b>Report</b>	1	15% (15)	13	LO # 12 and 13
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to the Prosthetics Clinical Phase
<b>Week 2</b>	Psychosocial Issues
<b>Week 3</b>	Amputation Surgery of the Lower Extremity
<b>Week 4</b>	Postsurgical Management
<b>Week 5</b>	Prosthetic Components
<b>Week 6</b>	Other Levels of Amputation and Upper Extremity Amputations
<b>Week 7</b>	Clinical Decision-Making for Prosthetics
<b>Week 8</b>	The Child with an Amputations
<b>Week 9</b>	Patient Handling
<b>Week 10</b>	First Aid
<b>Week 11</b>	Wound repair
<b>Week 12</b>	Pressure ischemia
<b>Week 13</b>	Hospital administration
<b>Week 14</b>	Vascular clinic
<b>Week 15</b>	Mid Exam
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Prosthetics and Orthotics in clinical Practice	no
<b>Recommended Texts</b>		
<b>Websites</b>		

## Grading Scheme

مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<b>Research Methods in Health</b>		Module Delivery	
Module Type	<b>Support</b>		<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	<b>POER420</b>			
ECTS Credits	<b>5</b>			
SWL (hr/sem)	<b>125</b>			
Module Level	4	Semester of Delivery		8
Administering Department	09	College	03	
Module Leader	Dr.Mahmud Rasheed Ismail		e-mail	Muhmood.rashed@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Lect. Hind Dhiaa		e-mail	hind.dhiaa@nahrainuniv.edu.iq
Peer Reviewer Name	Assist Prof.Dr. Ammar Esam		e-mail	ammar.esam@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Statistics CREQ310		Semester	5
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 understand types of researches in medical Sciences</li> <li>2. To identify the types of experimental design</li> <li>3. To distinguish between null and alternative hypothesis</li> <li>4. To perform different statistical tests related to medical research</li> <li>5. To proper design and analysis of questionnaire</li> <li>6. To drive attitude and conclusion from analyzing primary and secondary data</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Identifying the medical research process and types</li> <li>2. Developing research questions and hypothesis</li> <li>3. Understanding Experimental and observational study designs</li> <li>4. Learning Data collection (primary and secondary)</li> <li>5. Performing correlation tests</li> <li>6. Performing t – distribution and t- test</li> <li>7. Performing ANOVA test and f- distribution</li> <li>8. Making Regression analysis</li> <li>9. Testing goodness of fitting and dependency</li> <li>10. Understanding Qualitative research methods and design</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Basic concepts and design of experiments ,types of medical studies [6 hrs]            Normal distribution ,Z- tables ,examples on using Z- tables ,probability concepts ,relation between normal curve area and probability hypothesis ,Null and alternative ,types of errors [ 6 hrs]            Data analysis ,data types ,types of variables and correlation test [7 hrs]            t-distribution and t –test ,solving examples on medical tests [6 hrs]            ANOVA analysis ,F distribution and solving examples [7 hrs]            Data fitting ,regration model and solving examples [8 hrs]            Questionnar design and analysis ,likert scal ,attitude and solving examples [6 hrs]            Chi square and chi distribution ,goodness of fitting and dependency ,solved examples [7 hrs] ..</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to develop students in medical research skills and be familiar with analyzing ,manipulation and statistical testing of data .This will be achieved through classes, interactive tutorials ,asking questions ,discussions and solving samples of problems in class and homework .
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4.8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
<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	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 10
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

## المناهج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to research methods in health
<b>Week 2</b>	Basic concepts of the research process and types
<b>Week 3</b>	Experimental and observational study designs
<b>Week 4</b>	Research design Hypothesis development
<b>Week 5</b>	Data collection(primary and secondary data ) ,types of variables
<b>Week 6</b>	Questionnaire design and analysis
<b>Week 7</b>	Correlations
<b>Week 8</b>	Descriptive statistics and Inferential statistics
<b>Week 9</b>	t – distribution and t- test
<b>Week 10</b>	ANOVA test and f- distribution
<b>Week 11</b>	Goodness of fitting
<b>Week 12</b>	Chi square test and chi distribution
<b>Week 13</b>	Regressing model
<b>Week 14</b>	SPSS software
<b>Week 15</b>	Reporting
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المناهج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches. Sage Publications.	No
Recommended Texts	Janet L ,(2011) Medical Statistics ,Oxford Handbook ,	No
Websites	<a href="https://www.statistics">https://www.statistics</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

**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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Manufacturing Processes		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	POER325			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	3	Semester of Delivery		6
Administering Department	09	College	03	
Module Leader	Dr. Mustafa Saad Ayoob		e-mail	mustafa.saad@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Prof. Dr. Ahmed A Al-Duroobi		e-mail	ahmed.alduroobi@nahrainuniv.edu.iq
Scientific Committee Approval Date	04/06/2023	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
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 understand the basic principles of manufacturing various products.</li> <li>2. To have a knowledge of the major classification of manufacturing processes.</li> <li>3. To have the ability to follow a sequence of operations to get the final product.</li> <li>4. To familiarize the students with the alternative manufacturing processes for the same products.</li> <li>5. To familiarize students with the most common tools and machines in industry.</li> <li>6. To have a knowledge about the industrial safety.</li> <li>7. The ability to make a decision about the most suitable manufacturing process for the prosthetics and orthotics.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To know the major classification of manufacturing processes with its terms.</li> <li>2. Correlate the material type with the possible fabrication processes.</li> <li>3. Describe the operations and tools for major manufacturing processes.</li> <li>4. To list the types of patterns and cores.</li> <li>5. To identify the major molding processes and machines</li> <li>6. To have a knowledge about the casting process</li> <li>7. To know and choose the proper plastic molding processes</li> <li>8. To know the basics about cutting and milling processes.</li> <li>9. To understand the drilling and grinding processes.</li> <li>10. To have a knowledge of advanced manufacturing techniques including powder metallurgy, lamina manufacturing and additive manufacturing.</li> <li>11. To be familiar with Flexible manufacturing systems, jigs and fixtures.</li> <li>12. To list the types of heat treatment techniques with their use.</li> <li>13. To apply the learning knowledge in proposing suitable manufacturing process sequence for manufacturing prosthesis and orthosis.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Introduction to manufacturing processes with general classification, General terms in manufacturing like simplification, mechanization and industrial safety [2 hrs]</p> <p>Pattern and core making [2 hrs]</p> <p>Mold and core making + Molding machines [3 hrs]</p> <p>Casting [3 hrs]</p> <p>Plastic molding processes [4 hrs]</p> <p>Cutting + Milling [2 hrs]</p> <p>Drilling + Grinding [3 hrs]</p> <p>Powder metallurgy + manufacturing tools [3 hrs]</p> <p>Lamina manufacturing [3 hrs]</p> <p>Flexible Manufacturing Systems [2 hrs]</p> <p>Additive Manufacturing [3 hrs]</p> <p>Jigs and fixtures [2 hrs]</p> <p>Heat treatment [2 hrs]</p> <p>Project 1 [4 hrs]</p>

	Project 2 [4 hrs]
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is that transferring knowledge with videos approach. In this approach, students will learn the common and up to date manufacturing processes and link this knowledge with videos to enhance their understanding to the processes. The other strategy was process estimation. This strategy encourages students to propose certain manufacturing paths to manufacture parts related to their main discipline. Other strategies include encouraging students' process matching and material selection in manufacturing were enhanced. This will be achieved through classes, interactive videos and projects.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3.9
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)	3, 10, 13	LO # 1-10
	Projects	2	20% (20)	8, 15	LO # 1-3, 11, 12, 13
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	1, 3-12
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to manufacturing processes with general classification
Week 2	General terms in manufacturing like simplification, mechanization and industrial safety
Week 3	Pattern and core making + Quiz 1
Week 4	Mold and core making + Molding machines
Week 5	Casting
Week 6	Plastic molding processes
Week 7	Mid-term exam
Week 8	Cutting + Milling + Project 1
Week 9	Drilling + Grinding
Week 10	Powder metallurgy + manufacturing tools + Quiz 2
Week 11	Lamina manufacturing
Week 12	Flexible Manufacturing Systems
Week 13	Additive Manufacturing + Quiz 3
Week 14	Jigs and fixtures
Week 15	Heat treatment + Project 2
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, 7th Edition by Groover	No
<b>Recommended Texts</b>	Manufacturing Engineering and Technology, 4th Edition- S.Kalpakjian and S.R. Scsimid, Pearson Education.	No
<b>Websites</b>	All websites that provide relevant information about manufacturing processes	

## Grading Scheme

مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Physiology	Module Delivery
Module Type	Elective	

Module Code	POER224		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	4
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dunya Khalaf hamad	e-mail	donia.khalaf@eng.naharinuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	M SC
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules
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العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

**Module Aims, Learning Outcomes and Indicative Contents**

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>1- Study and proper body functions 2- Study of health, safety and care 3- Knowing the causes of diseases, their pathogenesis and prevention 4- Principles and indications of surgical and therapeutic interventions, principles of pharmacology, toxicology and anesthesia 5- Learn about public health issues, common diseases, and the epidemiology of diseases Contribute to academic and applied research in every field</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>1. Learning Outcomes are clear statements of learning achievements for students, stating what it is the student should be able to demonstrate at the end of a period of learning. Module level learning outcomes should be capable of being assessed and easily understood by the student 2. Cognitive goals Teaching and learning the superficial anatomical signs of the body that indicate the locations of bones and muscles Tendons, blood vessels, nerves and other internal organ 3. link basic anatomy and embryology with manifestations of pathological conditions to reach a diagnosis the correct 4. Understanding the methods of research, recitation, discussion, and the development of intellectual abilities 5. Enabling students to obtain knowledge and understanding of the intellectual and skill framework 6. Enabling students to obtain knowledge and understanding of the ethics of the student's profession 7. Enable students to obtain knowledge and understanding of anatomy 8. Learn dialogue and discussion 9. The ability to work together and the ability to deliver and present and to use the computer and the Internet 10. Understanding and knowing the functions of the members accurately and knowing the pathological conditions to reach the correct diagnosis</p>



	<p>.11 Studying health problems and their impact on the health and effectiveness of members.</p> <p>12. Knowledge of blood, blood and serological tests to help diagnose diseases</p> <p>13. Evaluating and analyzing the different methods of infection control and determining the most appropriate for each disease case B3</p> <p>14. Evaluation of all pharmacological treatments, whether indicative or applied</p> <p>15 . The ability to think scientifically and the ability to imitate creativity The ability to interpret scientific phenomena, workshops and activities The ability to invent new scientific methods for treatments and put forward new ideas</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>Indicative content</b> Perinatal development, genetic influences, physiological adaptations at birth and homeostasis. Normal anatomy and physiology of major body systems Concepts of disease processes Physiology and pathophysiology of diseases and systems</p> <p>This module is delivered over one academic term. The above skills acquisition, contributes to the development of the <b>UWS Graduate Attributes : Universal</b> - critical thinking, analytical, inquiring, collaborative, research-minded and socially responsible; <b>Work Ready</b> - knowledgeable, digitally literate, effective communicator, motivated, potential leader; and <b>Successful</b> - autonomous, incisive, creative, resilient and daring.</p> <ul style="list-style-type: none"> <li>• Enhance students understanding of anatomy and physiology of major body systems</li> <li>• Enhance students understanding of the pathological processes in common conditions</li> <li>• To enable enhance understanding of the relevance of findings from clinical examination</li> </ul>

<p style="text-align: center;"><b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>Giving lectures in the form of Power Point, showing educational films, using plaster and plastic models, various anatomical sections of the brain, X-ray and magnetic resonance films, and student participation during discussions during teaching in small groups in practical laboratories</p> <p>Students' participation in interactive lectures in theoretical and practical lessons</p> <p>Lectures with discussions.</p> <ol style="list-style-type: none"> <li>1.White seborh</li> <li>2.Projector device</li> <li>3. Students participate in small groups</li> <li>4. Students' interactive participation during the lecture</li> <li>5. Using computers and the Internet to keep communicating with the progress of</li> </ol>

	scientific knowledge in human anatomy
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3.6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	10	20 % (20)	2,3,4,6,8,9,11 12,13 14	LO #10-11-12-13-14-15
	<b>Assignments</b>	-	-	-	-
	<b>Projects / Lab.</b>	-	-	-	-
	<b>Report /seminar</b>	1	20% (20)	13	LO # 4-5-6-7-8-9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	5.10	LO # 1-2-3
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to Human Physiology, Sciences of anatomy and physiology, Levels of Organization, Characteristics of Life, Maintenance of Life.
<b>Week 2</b>	Skeletal System, Bone Structure, Bone Classification, Parts of a Long Bone, Microscopic Structure , Compact Bone ,Spongy Bone, Homeostasis of Bone Tissue, Factors Affecting Bone Development, Growth and Repair, Bone Function, Inorganic Salt Storage ,Skeletal Organization, reflex arc , type receptor
<b>Week 3</b>	Cartilage, Types of cartilage, Blood, Types of blood, Blood Vessels, Types of Blood Vessels, Structure of VEINS & ARTERIES
<b>Week 4</b>	Bone and cartilage growth, Effects on Bone, Requirements for Growth Hormone to cause growth , Joints of the Skeletal System , Classification of Joints, ,Fibrous,, Cartilaginous Synovial Joints, Structural Classification of Joints, Types of Synovial Joints, Features of Synovial Joints, Types of Joint Movements..
<b>Week 5</b>	The Muscular System, Function of Muscles, Characteristics of Muscles, Three (3) Types of Muscle Tissues. Smooth Muscle, Cardiac Muscle, Skeletal Muscle.
<b>Week 6</b>	Structure of Skeletal Muscle, Connective Tissue Coverings, Skeletal Muscle Attachments, muscle fiber Arrangement, muscle fiber Arrangement, Microscopic Anatomy of Skeletal Muscle, Sarcomere
<b>Week 7</b>	Myofilaments, Motor Neuron, Neuromuscular Junction, Motor Unit, Synapse. Neurotransmitter, Nerve Stimulus to Muscles, Transmission of Nerve Impulse to Muscle, classification of neuron
<b>Week 8</b>	Stimulus for Contraction, Excitation-Contraction Coupling, The Sliding Filament Theory of Muscle Contraction (Contraction mechanism), Muscle Response to Strong Stimulated, type of contraction, Types of Skeletal Muscle Fibers
<b>Week 9</b>	Energy for Contraction, ATP Supply for Contraction, Oxygen & Muscle Contraction, Oxygen debt , Types of Contractions, Muscle Tone , Muscles and Body Movements, Effects of Exercise on Muscle
<b>Week 10</b>	Divisions of Peripheral, Classification of Neurons: Structural Differences, Classification of Neurons: Functional Differences, Types of Neuroglial Cells in the PNS, Types of Neuroglial Cells in the CNS, Nervous System, Action Potentials, Resting Potential

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	
<b>Week 8</b>	
<b>Week 9</b>	
<b>Week 10</b>	

Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Books Required reading: Textbook of Medical Physiology seventh edition 2. Veterinary physiology 3. Physiology Medical	Yes
Recommended Texts		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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Human Rights &amp; Democracy</b>		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UREQ110		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Inas Abdulameer Abbood	e-mail	inas.a.abbood@nahrainuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	none	Semester	
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 understand rights and freedoms</li><li>2. To Learn about children's rights</li><li>3. To Understanding the meaning of democracy, its types and its historical development until the present time</li><li>4. To Interested in the student's knowledge of democracy well, and the difference between it and freedom</li><li>5. To know the elections, their role and importance, and the role of the voter's voice</li><li>6. To Knowledge of democratic systems practiced by countries</li><li>7. To Recognizing the meaning of integrity and combating corruption in the system</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Developing cognitive skills To understand rights and freedoms, democracy and its types, stages of development of democracy and its importance Developing</li><li>2. Learning the rights of the child</li><li>3. Gaining the skill, experience and knowledge to perform the elections and their importance</li><li>4. understand pseudo-democracy and be able to know the meaning of democracy and its difference from freedom Performing</li><li>5. Understand Types of democracy used and the best and the reason for its use</li><li>6. Understanding Elections, methods and requirements</li><li>7. Knowing the meaning of integrity and combating corruption in the system</li><li>8. Develop the student's ability to dialogue and discussion</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Basic concepts of rights and freedoms and their types [2 hours]</p> <p>Child rights in legislation and Islam [2 hours]The roots of the concept of democracy and its development [2 hours],Elements, Requirements, and Environment of Democracy T [3 hours],The importance of elections</p> <p>Knowledge of its systems, terminology and application [3 hours],Recognizing the importance of the democratic system [1 hour]</p> <p>Objection and how to implement it [2 hours], Prepare a report[1 hour], Presentation on integrity and preservation of public money[2 hours]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in presenting this unit is to develop students' skills in research and familiarity with the concept of freedom and democracy, how to perform elections, the importance of one's voice, integrity, transparency, and the preservation of public money. Have the students present different topics via homework.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	30	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## 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 #1,2,3 and 5,6,7
	<b>Assignments</b>				
	<b>Projects</b>	1	10% (10)	15	-
	<b>Report</b>	2	10% (10)	12	LO # 1,3,4 and 5
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1,7,8 to 12
	<b>Final Exam</b>	3hr	60% (60)	16	All
<b>Total assessment</b>			100% (100 Marks)		



## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to rights and freedoms
Week 2	Children's rights in conventions and in Islam
Week 3	The roots of the concept of democracy and its development
Week 4	Learn the basics of democracy
Week 5	Knowledge of the requirements of democracy And the best environment for democracy
Week 6	Learn about its advantages to democracy and main ingredients
Week 7	Find out the best kind of democracy
Week 8	characteristics of the democratic system
Week 9	The importance of elections and preliminary procedures for elections
Week 10	Knowledge of election and referendum systems
Week 11	Objection and how to apply it and the popular solution
Week 12	Discussion of reports (the difference between freedom and democracy)
Week 13	Integrity and transparency in the democratic system
Week 14	
Week 15	Discuss a presentation on integrity and transparency
Week 16	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	National Center for Human Rights and Democracy (Iraq Ministry of Human Rights Research Department 2013) Political systems / Dr. Hamid Hanoun Khaled Human rights between text and application Dr. Ali Shukry The Interim State Administration Law of 2004 and the permanent Iraqi constitution of 2005 Human rights and democracy Prepared by a.m.d. Ghassan Karim Majthab, a.m. Amjad Zine El Abidine Tohme Jamil Hamdawi, Education and Democracy, Diwan Al Arab - <a href="http://www.diwanalarab.com">http://www.diwanalarab.com</a>	No
Recommended Texts	Dr. Maher Sabry Kazem Human Rights, Democracy and Public Freedoms (Baghdad 2010)	No
Websites	<a href="https://www.statistics">https://www.statistics</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

**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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Principles of Management		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UREQ211		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Inas Abdualameer Abbood	e-mail	inas.a.abbood@nahrainuniv.edu.iq
Module Leader's Acad. Title	Assist.Lect.	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	none	Semester	
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 understand the meaning of management and what it is and its types, including strategic management, human resource management and leadership.</li><li>2. Understanding the interrelationship between these functions, and highlighting the basic principles and related concepts.</li><li>3. Knowledge of management principles that can be practiced in all functions and learn how to practice concepts and theories in organizations</li><li>4. Understanding the levels of management, its role, the concept of leadership and its theories</li><li>5. Understand the main management functions planning, organizing, directing and manager roles</li><li>6. Acquisition of skill and experience in administrative work and knowledge of management levels</li><li>7. Understanding electronic management, the role of networks, the development in management and its role in the survival of any organization</li><li>8. Be able to know the administrative handling and its importance to the work of engineers and the work of a successful management model</li><li>9. The development of the student's ability to dialogue and discussion</li><li>10. The development of the student's ability to commit to performing homework within groups and to deliver on time to apply the principles of management</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Understanding management and its types</li><li>2. Stages of development of administration and its schools</li><li>3. Acquisition of knowledge of administrative work and knowledge of management levels</li><li>4. The importance of using management principles to manage any project in all medical, engineering and other specializations</li><li>5. Gaining knowledge of administrative dealings, its levels, and the importance of the leader</li><li>6. The importance of electronic management and benefit from the development in management</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Basic concepts of management, its types and elements [2 hours] Identifying the difference between administrative and executive work, types of management and manager levels [2 hours] Historical development and schools of management thought Director roles and its development [2 hour], knowing the difference between the two departments [1 hour], sub-administrative functions in public administration, and the concept of the system [1 hours], centralization and decentralization of the organizational structure and the difference between them, planning and its types [2 hours] Authority and responsibility Leadership theories and leadership behavior patterns [2 hours], preparing a report [2 hour], electronic management and obstacles [2 hours]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that you will adopt in presenting this unit is to develop students' skills in research and familiarity with the concept of management and its importance. It has a curriculum in all areas of life and its importance, levels and administrative, and the reason for career progression and the reasons for an administrative model for students to present different topics related to their specialization and write a report on the view of automation in the fields of engineering. homework way
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	30	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	<b>30/15=2</b>
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	<b>45/15=1</b>
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

## 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 #1,2,3 and 5,6,7
	<b>Assignments</b>				
	<b>Projects</b>	1	10% (10)	15	-
	<b>Report</b>	2	10% (10)	12	LO # 1,3,4 and 5
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1,7,8 to 12
	<b>Final Exam</b>	3hr	60% (60)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to concept of management and its importance and elements
Week 2	Identify the types of management, their levels and skills, the manager and his levels, and the functions related to management
Week 3	Historical development and schools of administrative thought Director roles
Week 4	The difference between public administration and business administration
Week 5	Sub-administrative jobs in the public administration
Week 6	The concept of the system and its components
Week 7	Centralization and decentralization of the organizational structure and the difference between them
Week 8	Learn about planning and its importance in any business
Week 9	The concept of decision-making, its importance, the factors affecting it and its patterns
Week 10	
Week 11	Authority and responsibility Leadership theories and leadership behavior patterns
Week 12	Differentiate between e-business, e-management and e-government
Week 13	Types of networks used and elements of electronic management
Week 14	The importance of electronic administration and the networks used
Week 15	Obstacles to electronic management
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Management Principles / Dr. Shawqi Naji Jawad Business Administration Principles / Dr. Khalil Al-Shamaa : Dr. Ahmed Al-Shammari & others, Principles of Business Administration, Obeikan Library. . Assistant Professor Alaa Daham Hamad Principles of Administration University of Baghdad / College of Administration and Economics Electronic management / Raafat Radwanhttp://www.diwanalarab.com	No
Recommended Texts		No
Websites	"Business Management", www.encyclopedia.com, Retrieved 2018-4-8. Edited. 2. ↑ "management", www.businessdictionary.com, Retrieved 2018-4-8. Edited by Agadir Al-Aidarous, Introduction to Management 4. ↑ Omar Dora, Introduction to Management. Kimberlee Leonard (3-13-2018), "Five Functions of Management & Leading", smallbusiness.chron.com, Retrieved 4-12-2018. Edited. Muhammad Bakri Abdel-Aleem (2007), Principles of Business Administration, Egypt: Benha University. "Importance of Management", www.managementstudyguide.com, Retrieved 8-12- 2018. Edited 8. "6 Types of Management Styles", online.grace.edu, Retrieved 9-11- 2018. Edited 9. "Levels of Management", www.managementstudyguide.com, Retrieved 8-12-2018.	

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>				

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Composite materials</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>POER413</b>		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Hayder abbas sallal	e-mail	Dr.hayder.A.S@ nahrainuniv.edu.iq
Module Leader's Acad. Title	lecture	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	----
Peer Reviewer Name	-----	e-mail	-----
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Biomaterials	Semester	4
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To develop skills in the Choose a composite material.</li><li>2. To understand the composite materials.</li><li>3. This course deals with the basic concept of the composite material.</li><li>4. This is the basic subject for all types of the composite material, reinforcements materials and matrices materials.</li><li>5. To understand the rule mixture.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Name the three main divisions of composite materials and cite the distinguishing feature of each.</li><li>2. Cite the difference in strengthening mechanism for large-particle and dispersion-strengthened particle-reinforced composites.</li><li>3. Distinguish the three different types of fiber reinforced composites on the basis of fiber length and orientation; comment on the distinctive mechanical characteristics for each type.</li><li>4. Cite the desirable features of metal-matrix composites.</li><li>5. Identify the types of the composite materials and reinforcements materials and matrices materials.</li><li>6. Explain the rule mixture of the composite materials</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction to the composite materials, Particle-Reinforced Composites, Fiber-Reinforced Composites. [15 hrs]</p> <p>Rule of mixture, Types of composite materials according to matrix ,Types of composite materials according to reinforcing materials. [15 hrs]</p> <p>Polymer matrix composites, Processing of Fiber-Reinforced Composites, Processing of composite materials according to matrix. [15 hrs]</p> <p>Composite Materials from Natural Resources , Biomaterials and Potential of Bio composites for Medical Applications and Classification of Composite Materials. [15 hrs]</p> <p>Biomedical Applications of Polymer Composites, Carbon Fibers and Nanofillers. [10 hrs]</p> <p>Advanced and nano composites [5 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' Participate in presentations in the form of a seminar, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes , and educational videos and theoretical lectures.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	44	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	4, 10	LO #1, 2, 3,4,7,8 and 9
	<b>Assignments</b>	2	15% (15)	5, 11	LO # 5,6,10 and 11
	<b>Projects / Lab.</b>	-	-	Continuous	All
	<b>Report</b>	1	15% (15)	13	LO # 12 and 13
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the composite materials
Week 2	Particle-Reinforced Composites
Week 3	Fiber-Reinforced Composites
Week 4	Rule of mixture
Week 5	Types of composite materials according to matrix
Week 6	Types of composite materials according to reinforcing materials
Week 7	Polymer matrix composites
Week 8	Processing of Fiber-Reinforced Composites
Week 9	Processing of composite materials according to matrix
Week 10	Composite Materials from Natural Resources
Week 11	Biomaterials and Potential of Bio composites for Medical Applications and Classification of Composite Materials
Week 12	Biomedical Applications of Polymer Composites
Week 13	Carbon Fibers and Nanofillers
Week 14	Advanced and nano composites
Week 15	Mid Exam
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	

Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Materials Science and Engineering An Introduction (William D. Callister) , AN INTRODUCTION TO BIOCOSMOS , BIOMATERIALS, Composite Materials Science and Applications Second Edition	no
Recommended Texts		
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.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<b>Dynamics</b>		Module Delivery	
Module Type	<b>Core</b>		<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	<b>POER120</b>			
ECTS Credits	<b>5</b>			
SWL (hr/sem)	<b>125</b>			
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr.Wajdi Sadik Aboud		e-mail	wajdi.sadiq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Lect. Suzan Hassan		e-mail	suzanhassanbma@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Mustafa Saad Ayoob Al-Khazraji		e-mail	mustafa.saad@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
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 Introduce and understand the basics of Dynamics Engineering Mechanics, and to provide students with the basic skills to analyse dynamics from first principles, contextualized to the human body.</li> <li>2. To understand the areas of dynamic analysis, as appropriate for prosthetics and orthotics engineering applications.</li> <li>3. To introduce the concepts of position, displacement, velocity, and acceleration.</li> <li>4. To study particle motion along a straight line and represent this motion graphically. In addition, to investigate particle motion a long curved path using different coordinate systems.</li> <li>5. To develop the principle of work and energy and apply it to solve problems that involve force, velocity, and displacement.</li> <li>6. To introduce a method for determining the moment of inertia for an area and the product of inertia and show how to determine the maximum and minimum moments of inertia for an area.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge and understanding of the dynamics of particles and bodies related to the limbs and motion of human</li> <li>2. Resolve the motion of single particles in multiple coordinate systems,</li> <li>3. Ability to form the relationship between displacement, velocity and acceleration,</li> <li>4. Demonstrate the motion of multiple particles in constrained motion,</li> <li>5. Use the equations of motion to compute the position, velocity, and acceleration of multiple points on rigid bodies in constrained motion,</li> <li>6. Apply the basic concepts of force, mass and acceleration; of work and energy; and impulse and momentum for particles and rigid bodies.</li> <li>7. Discuss a method for determining the moment of inertia for an area and the product of inertia.</li> <li>8. Apply the knowledge and tools of dynamics to solve engineering problems (related to P&amp;O), and Explain knowledge to peers through hand-written problem sets, verbalization, and writing.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Basic concepts the basics of dynamics Engineering Mechanics [6 hrs] study particle motion along a straight line and represent this motion graphically and investigate particle motion along a curved path using different coordinate systems [ 8 hrs]</p> <p>Analyze the accelerated motion of a particle using the equation of motion with different coordinate systems [7 hrs] Solving problems and homework [9 hrs] Study and solve problems that involve work, energy, power and efficiency [8 hrs] Discuss applications of the planar kinetic equations of motion to bodies undergoing translation, rotation about a fixed axis, and general plane motion [8 hrs] Recognize the moment of inertia and the mass moment of inertia [7 hrs].</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to provide the student with a clear and thorough presentation of the theory and application of engineering mechanics Dynamics and be familiar with analyzing, manipulating and solving problems related to Prosthetics and the prosthetics field. This will be achieved through classes, interactive tutorials, asking questions, discussions and solving samples of problems in class and homework.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
<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	15% (15)	4, 8	LO #1,2, 4 and 7
	<b>Assignments</b>	4	15% (15)	2,4,6	LO # 3,5,6 and 8
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 6 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 2 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to Dynamics and Basic Concepts
<b>Week 2</b>	Newton's Laws
<b>Week 3</b>	Kinematics of Particles
<b>Week 4</b>	Rectilinear Motion
<b>Week 5</b>	Solving Problems
<b>Week 6</b>	Plane Curvilinear Motion
<b>Week 7</b>	Rectangular Coordinates (x-y)
<b>Week 8</b>	Normal and Tangential Coordinates (n-t)
<b>Week 9</b>	Kinetics of Particles I
<b>Week 10</b>	Kinetics of Particles II
<b>Week 11</b>	Relative Motion (Translating Axes)
<b>Week 12</b>	Relative motion
<b>Week 13</b>	Plane Kinematics of Rigid Bodies
<b>Week 14</b>	Plane Kinetics of Rigid Bodies
<b>Week 15</b>	Area Moments of Inertia
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	



## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Engineering Mechanics: Dynamics Mareim 4 <sup>th</sup> or 5 <sup>th</sup> Edition	Yes
<b>Recommended Texts</b>	1. Engineering mechanics Dynamics, Hibbler 2. Biomechanics of human body, Susan Hill	No
<b>Websites</b>	None	

## Grading Scheme

### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Robotics and Smart Prosthesis</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER412		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr.Wajdi Sadik Aboud	e-mail	wajdi.sadiq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Assist Prof.Dr. Fahad Muhand	e-mail	fahad.mohanad@nahrainuniv.edu.iq
Peer Reviewer Name	Assist Prof.Dr.Yassr Y. Kahtan	e-mail	yasir.yaarb@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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 understand the basic concepts and theory governing the modelling of robots that perform autonomous tasks such as navigation and manipulation.</li> <li>2. to develop student's skills and knowledge of the fundamental mathematics and algorithms that underpin robotics, including representation of pose and motion</li> <li>3. To understand the fundamentals of kinematics, dynamics, trajectory planning, actuating, and sensing.</li> <li>4. To perform and deal with homogeneous transformations, forward and inverse kinematics of robotic manipulators, differential kinematic equations,</li> <li>5. It also presents the fundamental principles of proximity, tactile, and force sensing and actuating.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Describe the different physical forms of robot architectures.</li> <li>2. Identify a Kinematically model of simple manipulators and articulated robots.</li> <li>3. Describe in detail specific examples of robotics and advanced in areas such as prosthetics, orthotics, robotics, medical equipment, assistive devices, surgical robotics and more general industrial application areas.</li> <li>4. Mathematically describe a kinematic robot system.</li> <li>5. Analyze manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, and control.</li> <li>6. Compute forward and inverse kinematics for a small serial kinematic chain.</li> <li>7. Describe how sensors and actuators used in robotics applications work.</li> <li>8. Students will understand more about engineering design and the interplay between group solutions and individual contributions.</li> <li>9. Students will also learn a range of tools and techniques that can be applied across a range of problems.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><b><u>Part A – sensors and actuators</u></b> Introduces basic concepts of sensors and actuators; Analog-to-Digital Conversion Digital-to-Analog Conversion Input/Output Devices for Discrete Data [4 hrs] Exploring the application of sensors and actuators in robotics and smart prosthesis [6 hrs]</p> <p><b><u>Part B – Simple Robotics</u></b> Basic concepts the robot architectures [4 hrs] Study Types of Robots; Trends in Robotics, Robot Parts, Common Robot Designs, Technical Terms in Robotics, Spatial description and transformation and Fixed and Euler angles [ 5 hrs] Analyze the Manipulator Kinematics and Link Description, and also Link connection Description, Forward Kinematics of Manipulator, Examples [6 hrs] Solving problems and homework [6 hrs] Study and solve problems that involve Inverse Kinematics [8 hrs]</p> <p><b><u>Part C– Lab</u></b> Prepare and implement the Lab codes and solve the assignments [6 hrs] Recognize the Arduino, connecting circuits, and designing simple sensors and actuators. Also, writing Lab reports [8 hrs].</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to provide the student with a clear and thorough presentation of the theory and application of robotics kinematics and smart prosthesis and be familiar with analyzing, manipulating and solving problems related to Prosthetics and prosthetics field. This will be achieved through classes, interactive tutorials, asking questions, discussions and solving samples of problems in class and homework.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
<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	15% (15)	4, 8	LO #1,2, 4 and 8
	<b>Assignments</b>	4	15% (15)	2,4,6	LO # 3,5,6 and 7
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO #7 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 2 to 8
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction a. What Is Robotics b. What Is Robot c. Robotics As an Interdisciplinary Science d. Historical Overview e. Applications of Robotics f. Elements of a Robot System
<b>Week 2</b>	Sensors and Actuators a. Sensors b. Actuators c. Analog-to-Digital Conversion d. Digital-to-Analog Conversion e. Input/Output Devices for Discrete Data
<b>Week 3</b>	Types of Robots a. Trends in Robotics b. Robot Parts c. Common Robot Designs d. Technical Terms in Robotics
<b>Week 4</b>	Spatial description a. DESCRIPTIONS: POSITIONS, ORIENTATIONS, AND FRAMES b. MAPPINGS: CHANGING DESCRIPTIONS FROM FRAME TO FRAME
<b>Week 5</b>	Spatial Transformation a. OPERATORS: TRANSLATIONS, ROTATIONS, AND TRANSFORMATIONS b. SUMMARY OF INTERPRETATIONS c. TRANSFORMATION ARITHMETIC
<b>Week 6</b>	Spatial Transformation d. TRANSFORM EQUATIONS e. MORE ON REPRESENTATION OF ORIENTATION f. TRANSFORMATION OF FREE VECTORS
<b>Week 7</b>	Fixed and Euler angles
<b>Week 8</b>	Kinematics of robotics a. What is Kinematics b. Manipulator Kinematics c. Link Description
<b>Week 9</b>	Kinematics of robotics d. Link connection Description e. Forward Kinematics of Manipulator f. Examples
<b>Week 10</b>	Inverse Kinematics a. INTRODUCTION b. SOLVABILITY
<b>Week 11</b>	Inverse Kinematics THE NOTION OF MANIPULATOR SUBSPACE WHEN $n < 6$ ALGEBRAIC VS. GEOMETRIC
<b>Week 12</b>	Inverse Kinematics ALGEBRAIC SOLUTION BY REDUCTION TO POLYNOMIAL
<b>Week 13</b>	Inverse Kinematics GEOMETRIC SOLUTION
<b>Week 14</b>	Microcontroller I
<b>Week 15</b>	Microcontroller II
<b>Week 16</b>	<b>The preparatory week before the Final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Introduction to Robotics Laboratory Lab
<b>Week 2</b>	Lab 2: Introduction to Matlab symbolic variables, expressions and function
<b>Week 3</b>	Lab 3: Forward and Inverse Kinematics of Robots
<b>Week 4</b>	Lab 4: Denavit-Hartenberg Representation I
<b>Week 5</b>	Lab 5: Denavit-Hartenberg Representation II
<b>Week 6</b>	Lab 6: Arduino - Sensors
<b>Week 7</b>	Lab 7: Arduino - Actuators

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Introduction to Robotics: Mechanics and Control (4 <sup>th</sup> Edition); 2017; by John Craig; Publisher: Pearson	Yes
<b>Recommended Texts</b>	<ol style="list-style-type: none"> <li>1. Introduction to Robotics: Analysis, Control, Applications (2<sup>nd</sup> Edition); 2011; by Saeed Niku; Publisher: Wiley.</li> <li>2. K.S. Fu, R.C. Gonzalez, and C.S.G. Lee, Robotics: Control, Sensing, Vision and Intelligence, McGraw-Hill, 1987</li> <li>3. H.Asada and J. Slotive, Robot Analysis and Control, John Wiley &amp; Sons New York, 1986</li> </ol>	No
<b>Websites</b>	None	

## Grading Scheme

### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Statics		Module Delivery	
Module Type	Core		<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	POER110			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	1	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr.Wajdi Sadik Aboud		e-mail	wajdi.sadiq@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Lect. Suzan Hassan		e-mail	suzanhassanbma@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Mustafa Saad Ayoob Al-Khazraji		e-mail	mustafa.saad@nahrainuniv.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
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 Introduce and understand the basics of Static Engineering Mechanics.</li> <li>2. To provide students with the basic skills to analyse static from first principles, contextualised to the human body.</li> <li>3. To understand the areas of structural analysis, as appropriate for prosthetics and orthotics engineering applications.</li> <li>4. To develop skills, knowledge and problem-solving skills and understanding of Newton's Laws through the application of techniques regarding P&amp;O.</li> <li>5. To Consider the fundamental techniques of force analysis.</li> <li>6. To Identify and model various types of loading and support conditions that act on structural systems.</li> <li>7. To Apply pertinent mathematical, physical and engineering mechanical principles to the system to solve and analyze the problem.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge and understanding of static equilibrium as applied to the human body</li> <li>2. Testing the state of the bodies or particles when the load system is applied</li> <li>3. Determine the components of 2D/3D forces and moments in rectangular coordinate systems.</li> <li>4. Manipulate vector and geometric vectors to compute dot products, moments, and resultants as they relate to engineering problems.</li> <li>5. Identifying the applied forces and types of analysis</li> <li>6. Draw complete and correct free-body diagram(s) (including support reactions), then</li> <li>7. write and solve the appropriate equilibrium equations from the free-body diagram(s).</li> <li>8. Determine the member forces within trusses and joint reactions in frames and machines.</li> <li>9. Compute and draw the centroid and centre of gravity for regular and irregular bodies.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Basic concepts the basics of Static Engineering Mechanics [6 hrs]            Explain Vectors, trigonometric functions, and Types of algebraic analysis [ 6 hrs]            Describe the Line of action, Forces, Type of forces decompile, Resultant, and moments of forces [6 hrs]            Solving problems and homework [8 hrs]            Learning Geometric, graphical, and analysis methods [8 hrs]            Recognize the static system conditions [8 hrs]            Learning the components of 2D/3D forces and moments [8 hrs]            Study the concept of dry friction and show how to analyze the equilibrium of rigid bodies subjected to this force [8hrs]            Identify centroid for a body of arbitrary shape and one composed of composite parts, solved examples [6 hrs].</p>



## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to provide the student with a clear and thorough presentation of the theory and application of engineering mechanics Statics and be familiar with analyzing, manipulating and solving problems related to Prosthetics and the prosthetics field. This will be achieved through classes, interactive tutorials, asking questions, discussions and solving samples of problems in class and homework.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	15% (15)	4, 8	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,8 and 9
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	1	10% (10)	14	LO # 7 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Mechanics
Week 2	Statics of Particles
Week 3	Statics of Rigid Bodies
Week 4	Vectors
Week 5	Force analysis
Week 6	Moment of force
Week 7	Couples
Week 8	Distributed Forces
Week 9	Resultants
Week 10	Free Body Diagram
Week 11	Equilibrium
Week 12	Friction Forces
Week 13	Centre of gravity
Week 14	Moments of Inertia
Week 15	Forces in 3D_1
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Engineering Mechanics: Statics Mareim 4 <sup>th</sup> or 5 <sup>th</sup> Edition	Yes
<b>Recommended Texts</b>	1. Engineering mechanics, Hibler 2. Biomechanics of human body, Susan Hill	No
<b>Websites</b>	None	

## Grading Scheme

### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Automatic Control		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER310		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Lect. Salim Fattah Awad	e-mail	Salimfa68@eng.nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH220	Semester	4
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. Developing The skills goals special to the course.</li> <li>2. Understanding the Control philosophy.</li> <li>3. How to apply this philosophy in work field.</li> <li>4. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.</li> <li>5. Designing control and measuring systems.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. To learn basic concepts of control and measurements.</li> <li>2. To learn transient response according to time domain analysis.</li> <li>3. To developing professional capabilities of students.</li> <li>4. To find out types, patterns, assembly units and residential complexes, according to their surrounding environment relationship.</li> <li>5. To design feedback system.</li> <li>6. To checklist performance of system with and without PID controller.</li> <li>7. To understanding measuring problems and how to solve it in future.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Introduction to the fundamental principles, methods, and tools in automatic control engineering. [6 hrs]</p> <p>Laplace transform and applications (examples and home work) [6 hrs]</p> <p>Transient response according to time domain analysis [ 6 hrs]</p> <p>Control system basic: mathematical modeling, block diagram, open-loop, and closed-loop. [7 hrs]</p> <p>Modeling of Dynamic Systems. [7 hrs]</p> <p>Examples of systems, transfer functions [6 hrs]</p> <p>Stability of Control System and the Methods of determining stability [8 hrs]</p> <p>Understanding measuring problems and how to solve it in future.[7 hrs] ..</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programmer specification.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	<b>86/15=5.7</b>
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	<b>64/15=4.3</b>
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 10
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	4	10% (10)	14	LO # 7 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction , Definitions, of Closed loop control system and Transfer Function .
Week 2	Mathematical Models of System and Laplace transform and applications (examples and home work)
Week 3	Block Diagram Transformation Theorems
Week 4	Multiple Input System and Multiple input Multi-output System
Week 5	Time Domain Analysis of Control Systems
Week 6	Introduction to measurement System
Week 7	Stability of Control System and Methods of determining stability
Week 8	Routh's Stability Criterion
Week 9	Root locus Method
Week 10	Bode Diagram
Week 11	Basic Concepts and Definitions of Measurements Science
Week 12	Classification of Measuring Instruments According to their Functions
Week 13	Active and Passive Instruments Classification
Week 14	Accuracy and Error and uncertainty
Week 15	Dynamical properties for instrumentations
Week 16	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	<b>INTRODUCTION TO MATLAB SIMULINK</b>
Week 2	<b>FIRST ORDER SYSTE RESPONSE</b>
Week 3	<b>TRANSIENT-RESPONSE OF STANDARD SECOND-ORDER SYSTEM</b>
Week 4	<b>SECOND ORDER SYSTEM RESPONSE.</b>
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Otomatic control system by KUO Control system engineering by Norman S. Nise	No
Recommended Texts	Modern control engineering by OGATA	No
Websites	<a href="http://imtiaghussainkalwar.weebly.com">http://imtiaghussainkalwar.weebly.com</a>	

Grading Scheme				
مخطط الدرجات				
ثابت بدون تغيير				
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>				



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Electronics			
Module Title	Electronics		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	POER222		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Lect. Salim Fattah Awad	e-mail	Salimfa68@eng.nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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 circuit theory through the application of techniques.</li> <li>2. To understand voltage, current and power from a given circuit.</li> <li>3. This course deals with the basic concept of electrical circuits.</li> <li>4. This is the basic subject for all electrical and electronic circuits.</li> <li>5. To understand Kirchhoff's current and voltage Laws problems.</li> <li>6. To perform mesh analysis.</li> <li>7. To understand Diodes and Transistors perform.</li> <li>8. This course deals with the basic concept of Electronic filters</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Recognize how electricity works in electrical circuits.</li> <li>2. List the various terms associated with electrical circuits.</li> <li>3. Summarize what is meant by a basic electric circuit.</li> <li>4. Discuss the reaction and involvement of atoms in electric circuits.</li> <li>5. Describe electrical power, charge, and current.</li> <li>6. Define Ohm's law.</li> <li>7. Identify the basic circuit elements and their applications.</li> <li>8. Discuss the operations of sinusoid and phasors in an electric circuit.</li> <li>9. Discuss the various properties of resistors, capacitors, and inductors.</li> <li>10. Explain the two Kirchoff's laws used in circuit analysis.</li> <li>11. Understanding Semiconductor Diodes</li> <li>12. Understanding Diode Applications in D.C.</li> <li>13. Understanding Diode Applications in A.C.</li> <li>14. Understanding Clippers networks</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs]</p> <p>AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs]</p> <p>AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs]</p> <p>RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programmer specification.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	<b>86/15=5.7</b>
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	39	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	<b>39/15=2.6</b>
<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	15% (15)	5, 10	LO #1,2, 4 and 5
	<b>Assignments</b>	4	15% (15)	2,4,6,8,	LO # 3,6,9 and 10
	<b>Projects</b>	-	-	-	-
	<b>Report</b>	4	10% (10)	14	LO # 7 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 3 to 7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Basic Concepts
<b>Week 2</b>	Electrical Resistance, Ohm's Law
<b>Week 3</b>	Resistors in Series & Voltage Divider Rule, Resistors in parallel & Current Divider Rule
<b>Week 4</b>	Active and passive circuit elements, Sources in D.C. circuits
<b>Week 5</b>	Independent sources (Voltage and current sources), Independent source conversion
<b>Week 6</b>	Kirchhoff's First and second law, Circuit analysis methods
<b>Week 7</b>	Mesh current analysis
<b>Week 8</b>	Electronic Systems, Diodes
<b>Week 9</b>	Transistors, Operational Amplifiers
<b>Week 10</b>	Signals Analysis, The Human Body and its Signals, Signal and noise
<b>Week 11</b>	The Human Body and its Signals, Myo electrodes, Metal to metal paste electrode
<b>Week 12</b>	Amplifier types, gain, frequency response
<b>Week 13</b>	Electronic filters
<b>Week 14</b>	Interface rejection technique
<b>Week 15</b>	Safety, earthing, fuse breaker
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Ohm's Law
<b>Week 2</b>	Series DC Circuits
<b>Week 3</b>	Parallel DC Circuits
<b>Week 4</b>	Series-Parallel DC Circuits
<b>Week 5</b>	<b>Semiconductor Diode Characteristics</b>
<b>Week 6</b>	<b>Ac to Dc Voltage Conversion</b>
<b>Week 7</b>	<b>Voltage Doubler Circuit</b>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Fourth edition Microelectronics circuit analysis and design	No
<b>Recommended Texts</b>	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>	

## Grading Scheme

### مخطط الدرجات

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