	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering College Biomedical Engineering Department	

MODULE DESCRIPTION FORM

Module Information					
Module Title	Mechanics of Material			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	WBM-31-02				
ECTS Credits	3				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**	1	
Administering Department	BME		**College**	ENG	
Module Leader	Natiq Aziz Omran		**e-mail**	Nataq.az@uowa.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. To develop problem solving skills and understanding of the behavior of engineering materials under different loading conditions. 2. To understand stress, strain, and deformation in structural members. 3. This course deals with the basic concepts of strength of materials. 4. This is a fundamental subject for mechanical and biomedical engineering applications. 5. To understand axial, torsional, and bending stress problems. 6. To perform stress and deformation analysis in beams, shafts, and structural elements. 7. To apply basic failure theories and material properties in engineering analysis.
Module Learning Outcomes	After successfully completing this module, students will be able to: 1. Explain the fundamental concepts of stress, strain, and deformation in engineering materials. 2. Identify and classify different types of loads and their effects on structural members. 3. Analyze axial stress and strain in bars subjected to tensile and compressive forces. 4. Evaluate torsional stresses and angles of twist in circular shafts. 5. Determine bending stresses and normal stresses in beams subjected to transverse loading. 6. Analyze shear stresses in beams and thin-walled members. 7. Apply the concepts of elastic behavior, Hooke's law, and material properties such as Young's modulus, shear modulus, and Poisson's ratio. 8. Calculate thermal stresses and strains resulting from temperature changes. 9. Assess combined stresses and determine principal stresses and maximum shear stresses. 10. Use appropriate failure theories to predict material behavior under different loading conditions. 11. Solve engineering problems related to strength and deformation of materials using analytical methods. 12. Demonstrate problem-solving skills relevant to mechanical and biomedical engineering applications.
Indicative Contents	Indicative content includes the following: Strength of Materials Theory Stress and strain concepts, types of stress and strain, mechanical properties of materials. Axial loading of members, elastic deformation and Hooke's law. Torsion of circular shafts, angle of twist and shear stress. Bending of beams, bending stress and flexural formula. Shear stress in beams. Combined stresses, principal stresses and failure theories. Thermal stresses and strains.

Learning and Teaching Strategies	
Strategies	The main strategy adopted in delivering this module is to enhance students' understanding of the fundamental principles of strength of materials through lectures and problem-solving activities. Emphasis is placed on developing analytical skills by applying theoretical concepts to practical engineering problems. Lectures are used to explain key topics such as stress, strain, torsion, bending, and material behavior under different loading conditions. Problem-solving exercises are integrated into the teaching process to improve students' ability to analyze and solve numerical problems. Continuous assessment methods, including quizzes, assignments, and examinations, are used to evaluate students' progress and reinforce learning outcomes. This approach encourages active student participation and supports the development of critical thinking and independent learning skills.

Student Workload (SWL)			
Structured SWL (h/sem)	123	**Structured SWL (h/w)**	6
Unstructured SWL (h/sem)	27	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	150		

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Units and common principles and Analysis of Internal Forces and Stresses
Week 2	Normal stress and Shear stress and safety Factor
Week 3	Torsion of Circular Shaft and Torsion of non- circular section
Week 4	
Week 5	Current divider rule, open and short circuits.
Week 6	Series-Parallel Networks, series-parallel DC networks.
Week 7	Mid-term Exam
Week 8	Thin walled pressure vessels
Week 9	Simple Strain and Deformations of Axially Loaded Members
Week 10	Deformation of axially loaded members
Week 11	Displacement Diagram
Week 12	Statically indeterminate problems
Week 13	Thermal stresses and strains
Week 14	The Columns, Definition, The Critical load of column, Radius of Gyration.
Week 15	Combined Stresses, Combined axial and bending loading, Combined axial and torsional loading, Combined bending and torsional loading
Week 16	Preparatory week before the final Exam
Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Lab 1: Introduction to mechanics of materials
Week 2	Lab 2: loading effects on material
Week 3	Lab 3: stress
Week 4	Lab 4: strain
Week 5	Lab 5: bending
Week 6	Lab 6: relation between stress and strain
Week 7	Lab 7: torsion

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Strength of Materials, Third and Fourth Edition. Ferdinand and L.Singer Andrew Pytel	Yes
Recommended Texts	An Introduction to the Mechanics of Elastic and Plastic Deformation of Solids and Structural Materials THIRD EDITION E. J. HEARN Ph.D., B.Sc. (Eng.) Hons., C.Eng., F.I.Mech.E., F.I.Prod.E., F.1.Diag.E.	Yes
Websites	http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IITROORKEE	

Grading Scheme			
Group	**Grade**	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	(45-49)	More work required but credit awarded
	F – Fail	(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.			

Unit Description Form

Course Description Form

Faculty of Engineering / Department of

Unit Information

Course Information

Unit Title	**Histology**	**Unit delivery**	
Unit Type	**Core**	☒ نظريه ☒ حاضر ☒ المختبر ☐ تعليمي ☐ عملي ☐ Seminar	
Unit Code	BME-316		
ECTS Credits	**8**		
SWL (ساعة / SEM)	**125**		
Unit level	3	**Delivery Semester**	1
Department of Administration	Biomedical Engineering	**College**	College of Engineering
Unit Commander	Kawthar Ali Hasan	**E-mail Address**	Kawthar.ali@uowa.edu.iq
Title of Unit Commander	Assist-Lecture	**Unit Commander Qualifications**	Doctor
Unit Teacher		**E-mail Address**	
Peer Reviewer Name	Name	**E-mail Address**	
Date of accreditation of the Scientific Committee	26/9/2024	**Version number**	1.0

Relationship with other units

Relationship with other subjects

Prerequisites Unit	No	**Semester**	
Common Requirements Unit	No	**Semester**	

Unit objectives, learning outcomes and how-to contents Course objectives, learning outcomes and instructional contents	
Objectives of the Unit Course Objectives	The course aims to enable students to acquire the following skills: • Identify the different types of tissues in the body, such as epithelial, muscular, nervous, and connective tissues. • Enable students to gain general knowledge about tissues. • Understand the characteristics of tissues and the damage that may occur in them. • Learn about specialized types of tissues. • Recognize histological stains and their use in preparations and early detection of some diseases. • Understand the relationship between histology and physiology.
Unit Learning Outcomes Learning outcomes of the course	1. Training the student on the purposeful engineering mindset 2. Make the student able to distinguish between engineering materials and their uses. 3. Applying theoretical concepts through conducting practical experiments on the properties of matter. 4. Recognize and understand how to choose the right material in the right place. The ability to analyze and discover the problem or error and the ability to find a solution to the error.
Indicative Contents Indicative Contents	Introduction to Tissues: Defining the types of tissues and their basic functions. • Epithelial Tissues: Study of tissues that cover the internal and external surfaces of the body, such as the skin and intestines. • Muscle Tissues: Study of tissues responsible for movement, including skeletal, cardiac, and smooth muscles. • Nervous Tissues: Study of tissues that handle nerve signals, such as nerves and the brain. • Connective Tissues: Study of tissues that support and connect other tissues, such as tendons and cartilage. • Specialized Tissues: Such as blood, bone, and glandular tissues. • Pathological Changes in Tissues: Study of how tissues change due to diseases or injuries.

Learning and Teaching Strategies Learning and Teaching Strategies	
Strategies	1. Using the Smart Board and Illustrative Images Whenever Possible. 2. Using the Light Microscope at Different Magnifications with Objective and Eyepiece Lenses.

Student Workload (SWL) The student's academic load is calculated for 15 weeks			
SWL منظم (h / sem) Regular academic load of the student during the semester	64	**SWL regulator(h/s)** Regular student load per week	4
SWL غير منظم (h / sem) Irregular academic load of the student during the semester	61	**Unregulated SWL (h/s)** Irregular student academic load per week	4
SWL إجمالى (h / sem) The student's total academic load during the semester	125		

Unit Evaluation Course Evaluation					
	As	**Time/Number**	**Weight (tags)**	**Week due**	**Related learning outcomes**
Formative Assessment	**Contests**	2	10% (10)	5, 10	2&1
	Assignments	2	10% (10)	2, 12	2&1
	Projects /Laboratory.	1	10% (10)	continuous	2&1
	report	1	10% (10)	13	
Final Assessment	**Midterm Exam**	2 hr	10% (10)	7	2&1
	Final Exam	2 hours	50% (50)	16	every
	Overall Rating		100% (100 degree)		

Delivery Plan (Weekly Curriculum) Theoretical Weekly Curriculum	
week	**Covered Material**
Week 2+1	General Introduction: History of histology, review of cell components, and the concept of tissue.
Week 3	Epithelial Tissue: Characteristics of epithelial tissues, their functions, classification, and information about pseudostratified and transitional epithelium.
Week 4	Connective Tissue: Introduction to connective tissue, its functions, components, and ground substance
Week 5	Connective Tissue: Collagen fibers, elastic fibers, and reticular fibers.
Week 6	Bone Tissue: Components of bone, its functions, bone cells, types of bone tissue, and bone diseases
Week 7	Blood: Components and functions of blood, blood cells and plasma, and common blood disorders.
Week8	Cartilage: Histological structure of cartilage, cartilage cells, and functions of cartilage
Week 9	Types of Cartilage: Hyaline, elastic, and fibrocartilage.
Week 10	Nervous Tissue: Its types and characteristics, distribution in the body, and functions
Week 11	Muscle Tissue: Its types, characteristics, distribution in the body, and functions.
Week 12	Heart and Smooth Muscles

Week 13	Lymphatic System: Histological structure of some organs and its adaptation to function.
Week 14	Study of the Compound Light Microscope: Learning about the types of light microscopes and the cameras used for tissue imaging
Week 15	Exams

Learning and Teaching Resources

Learning and Teaching Resources

	text	Available in the library?
Required texts	Junqueiras- basic – histology and cell biology Text book of veterinary histology by samuelson 2010	Yes
Recommended texts	General Histology Books	Yes
Websites	http://www.iasj.net الاكاديميه العلمية المجلات	

Grading chart

Grading chart

group	degree	Appreciation	Tags (%)	definition
An-Najah Group (50 - 100)	**A -** Excellent	privilege	90 - 100	Outstanding Performance
	B - Very Good	Very good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Proper work with noticeable errors
	D - Satisfactory	medium	60 - 69	Fair but with significant shortcomings
	E - sufficient	Acceptable	50 - 59	The work meets the minimum standards
Group failure (0 – 49)	**FX -** Failed	Deposit (in (processing	(45-49)	More work required but credit granted
	F - Failed	Failure	(0-44)	Large amount of work required

Note: Signs that are more than 0.5 decimal places greater than or below the full mark will be rounded higher or lower (for example, a score of 54.5 will be rounded to 55, while a mark of 54.4 will be rounded to 54. The university has a policy of not tolerating "imminent traffic failure", so the only modification to the marks granted by the original mark(s) will be the automatic rounding described above.

Unit Description Form

Course Description Form

Faculty of Engineering / Department of Biomedicine

Unit Information				
Course Information				
Unit Type	**Electromagnetics**			نظريه ☒ حاضر ☒ المختبر ☒ تعليمي ☐ عملي ☐ ☐ **Seminar**
Unit Code	**BME-312**			
ECTS Credits	**3**			
SWL (ساعة / SEM)	**150**			
Unit level	3	**Delivery Semester**	1	
	Biomedical Engineering	**College**	College of Engineering	
Unit Commander	Saad M. Sarhan	**E-mail Address**	saad.mah@uowa.edu.iq	
Title of Unit Commander	Assistant Doctor	**Unit Commander Qualifications**	Doctor	
Unit Teacher		**E-mail Address**		
Peer Reviewer Name		**E-mail Address**		
Date of accreditation of the Scientific Committee	26/9/2025	**Version number**	1.0	

Unit objectives, learning outcomes and how-to contents	
Course objectives, learning outcomes and instructional contents	
Objectives of the Unit	

Course Objectives	□ Understand the fundamental concepts of scalars, vectors, vector algebra, and different coordinate systems. □ Apply Coulomb's Law and compute electric field intensity for different charge distributions (line, surface, and volume). □ Understand electric flux density, Gauss's Law, and the concept of divergence. □ Use the **Del operator** and apply the Divergence Theorem in field analysis. □ Analyze the relationship between electric potential and energy in electrostatic fields.
Unit Learning Outcomes Learning outcomes of the course	By the end of this unit, students will be able to: 1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. 2. An ability to apply engineering design process to produce solutions that meet specified needs with consideration of public health, safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline. 3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion. 4. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge

Indicative Contents
Indicative Contents
	1. Overview of Scalars, Vectors, Vector Algebra, and Coordinate Systems
	• Definitions of scalar and vector quantities.
	• Vector operations: addition, subtraction, dot product, and cross product.
	• Coordinate systems:
	  ○ Cartesian
	  ○ Cylindrical
	  ○ Spherical
	• Coordinate transformations.
	
	2. Coulomb's Law and Electric Field Intensity + Charge Distributions
	• Coulomb's Law for electric force.
	• Electric field intensity due to point charges.
	• Electric field for:
	  ○ Line charge distributions
	  ○ Surface charge distributions
	  ○ Volume charge distributions

	• Examples and tutorial problems.
	3. Electric Flux Density, Gauss's Law, and Divergence • Definition of electric flux density **D** and its relation to **E**. • Gauss's Law and its mathematical forms. • Applying Gauss's Law to symmetric field problems. • Divergence and its physical interpretation in electrostatics.
	4. Del Operator and Divergence Theorem • Definition and components of the **Del (∇) operator**. • The divergence operation (**∇·A**). • Divergence Theorem and applications in field analysis.
	5. Energy and Potential • Electric potential and its relation to the electric field. • Calculating potential for different charge distributions. • Energy stored in the electric field. • Relationship among work, potential, and electric field.

Learning and Teaching Strategies Learning and Teaching Strategies	
Strategies	□ The instructor delivers detailed theoretical lectures. □ The instructor assigns periodic reports on the fundamental topics of the course. □ Continuous assessment: conducting short quizzes and regular exercises to monitor students' progress and identify areas that need reinforcement. □ Explanation and discussion: encouraging students to explain their solutions and reasoning to promote deep understanding and improve communication skills

Student Workload (SWL) The student's academic load is calculated for 15 weeks			
SWL منظم (h / sem) Regular academic load of the student during the semester	78	**SWL regulator(h/s)** Regular student load per week	4
SWL غير منظم (h / sem) Irregular academic load of the student during the semester	72	**Unregulated SWL (h/s)** Irregular student academic load per week	4

إجمالي SWL (h / sem) The student's total academic load during the semester	125

Unit Evaluation
Course Evaluation

As		Time/Number	Weight (tags)	Week due	Related learning outcomes
Formative Assessment	Contests	2	10% (10)	5, 10	LO #1 , 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO #3 , 4, 6 and 7
	Projects /Laboratory.	1	10% (10)	continuous	every
	report	1	10% (10)	13	LO #5 , 8 and 10
Final Assessment	Midterm Exam	2 hr	10% (10)	7	LO #1-7
	Final Exam	2 hours	50% (50)	16	every
	Overall Rating		100% (100 degree)		

Delivery Plan (Weekly Curriculum)
Theoretical Weekly Curriculum

week	Covered Material
Week 3+2+1	Overview about scaler, vector, vector algebra, and types of coordinate systems.
Week 4+5	Coulomb's Law and Electric Field Intensity, line charge, surface charge, and volume charge, Tutorial
Week 6+7+8+9	Electric Flux Density, Gauss's Law, and Divergence
Week 10+11+12	Del operator and Divergence Theorem
Week 13+14	Energy and Potential
Week 15	Maxwel Equatiions

Learning and Teaching Resources

Learning and Teaching Resources

	text	Available in the library?
Required texts	Electricity and Magnetism by Purcell	Yes
Recommended texts		Yes
Websites		

Grading chart

Grading chart

group	degree	Appreciation	Tags (%)	definition
An-Najah Group (50 - 100)	**A -** Excellent	privilege	90 - 100	Outstanding Performance
	B - Very Good	Very good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Proper work with noticeable errors
	D - Satisfactory	medium	60 - 69	Fair but with significant shortcomings
	E - sufficient	Acceptable	50 - 59	The work meets the minimum standards
Group failure (0 – 49)	**FX -** Failed	Deposit (in processing)	(45-49)	More work required but credit granted
	F - Failed	Failure	(0-44)	Large amount of work required

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نموذج وصف الوحدة

نموذج وصف المادة الدراسي

كلية الهندسة / قسم الطب الحياتي

Module Information معلومات المادة الدراسية					
Module Title	**Medical Equipment**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BME-317**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGIII		**Semester of Delivery**	Five	
Administering Department	BME.		**College**	ENG.	
Module Leader	Dr. Hayder A. Yousif		**e-mail**	hayderyousif@uowa.edu.iq	
Module Leader's Acad. Title	Doctor		**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	01/10/2025		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goal of this one-semester course is to provide the students by a broad overview on " Medical Equipment" with focus on theory, working principle, generations and Medical Applications for the main equipments like X- ray , MRI , CTS and Dental chair. Also training the students in the laboratory to be familiar with most of equipment parts
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Explain the main components of each medical equipment and haw can match these components to produce a good picture that can help the doctors and patient in successful diagnosis and therapy .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Theory This section constitutes the lecture notes to provide undergraduate students of biomedical engineering, X ray theory, terms and components. Also the electrical part and the imaging part . the same section with CTS & MRI Part B - Laboratory. This section to enhance knowledge that started in the theory part, in order to help students to improve these equipments.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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.

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

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Medical equipments
Week 2	X-Ray Equipment, X-ray definition and theory
Week 3	X-Ray Equipment, X-ray production,
Week 4	Design of X-ray tube, X-ray power supplies and circuits, Heat loading
Week 5	X-ray imaging part cassette . film and filters
Week 6	characteristics of X-ray tube,
Week 7	1st Mid-Exam

Week 8	X-ray control unit, X-ray switches and timing model
Week 9	method for exposure control unit
Week 10	Development of X-ray films (automatic and manual), X-ray fluoroscope machine
Week 11	ypical faults and maintenance of the X-ray,
Week 12	X-ray Computed Tomography scan (CTS),
Week 13	CTS generations, resolution, faults, risks and applications
Week 14	MRI equipments theory, main types, applications and improvement methods
Week 15	Tooth Chair, Tooth chair, main parts and operation, Pneumatic circuits, Hydraulic circuits, Typical faults and maintenance of Tooth chair.
Week 16	2nd Mid - Exam **- Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to X -ray components
Week 2	Lab 2:x- ray electrical generator and circuits
Week 3	Lab 3: x-ray imaging part
Week 4	Lab 4: CTS parts and gantry
Week 5	Lab 5: MRI coils and display part
Week 6	Lab 6: Dental Chair parts
Week 7	Lab 7: medical equipment hazards and safty

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	MEDICAL PHYSICS by John R. Cameron & James G. Skofronick	
Recommended Texts	ESSENTIAL GUIDE TOMEDCAL EQUIPMENT PRINCIPLES by David Mulvey	
Recommended Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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.

	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering College Biomedical Engineering Department	

MODULE DESCRIPTION FORM

Module Information					
Module Title	Engineering analysis			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☒ **Lecture** **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BME-315				
ECTS Credits	2				
SWL (hr/sem)	30				
Module Level			**Semester of Delivery**	1	
Administering Department	BME		**College**	ENG	
Module Leader	Ali mohammed abdulsadaa		**e-mail**	Ali.mohammed@uowa.edu.iq	
Module Leader's Acad. Title	Assistant lecture		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	The topic of geometric analysis of frequency functions mathematically aims to clarify the practical and philosophical challenges of current geometric analyses that have stimulated this continuous development, as well as to provide the basic concepts of functions and their useful fields for further study of engineering sciences and applied analytical mathematics in the scientific and practical field. This is done starting from reviewing the basic principles, studying the meaning of the function and how to draw it on the attempt, analyzing the integrative in relation to time and frequency, finding the purpose for it, vectors, and finally the polar coordinates, in addition to introducing the principles of integration and calculus, their applications, and some functions in particular, in addition to increasing the opportunity for students to practice sound thinking methods, such as reflective, deductive, and inductive thinking, and increasing their skills in using the problem-solving method to understand what they are studying, and to reveal new relationships.
Module Learning Outcomes	1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. 2. An ability to apply engineering design process to produce solutions that meet specified needs with consideration of public health, safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline. 3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Indicative Contents	B. Skills objectives of the course B1- Familiarity with the mathematical analytical relations that represent the types of algebraic functions and their drawing. C2- Familiarity with the laws of finding the derivative using the definition and returning it to the basic function under the influence of the integration properties. C3- Familiarity with finding the field and the corresponding field of a function with one variable and how to draw it in terms of Cartesian coordinates A4- Familiarity with concepts does not achieve the goal, solving immediate equations and performing algebraic operations on them.

Learning and Teaching Strategies	
Strategies	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.

Student Workload (SWL)			
Structured SWL (h/sem)	33	**Structured SWL (h/w)**	6
Unstructured SWL (h/sem)	17	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	50		

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Fourier series
Week 2	Complex Fourier series
Week 3	examples
Week 4	Fourier transform
Week 5	Application of fourier transform
Week 6	examples
Week 7	Midterm exam
Week 8	Laplace transform
Week 9	Invers laplace transform
Week 10	examples
Week 11	The sequence
Week 12	Z transform
Week 13	Application of Z transform
Week 14	examples
Week 15	examples
Week 16	Preparation week before the final exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Signals and systems , Sanjay sharma. 2011	Yes
Recommended Texts	Signals and systems , Sanjay sharma. 2011	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme			
Group	**Grade**	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	(45-49)	More work required but credit awarded
	F – Fail	(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.			

نموذج وصف الوحدة

نموذج وصف المادة الدراسي

كلية الهندسة / قسم الطب الحياتي

Module Information معلومات المادة الدراسية					
Module Title	**Trunk Anatomy**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BME-314**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UGIII		**Semester of Delivery**	Five	
Administering Department	BME.		**College**	ENG.	
Module Leader	MSc. Ghufran Basim Medeb		**e-mail**	ghufran.basim95@gmail.com	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	MSc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	21/9/2025		**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	1. To know the types of body tissues and distinguish their characteristics. 2. To understand nervous tissue histology 3. This course deals with the basic concept of Muscle tissue. 4. This is the basic subject for all body tissues. 5. To develop skills dealing with stain. 6. To Know the types of microscopes used in diagnosis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. 2. An ability to apply engineering design process to produce solutions that meet specified needs with consideration of public health, safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline. 3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion. Discuss the most important tissues that cover the skeletal system 4. An ability to communicate effectively with a range of audiences. 5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments which must consider the impact of engineering solutions in global, economic, environment, and social context. 6. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge Discuss the most important dyes used in diagnosis 7. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Movements of shoulder joint Ventral and dorsal flexion , Movements of shoulder joint Abduction and adduction , Movements of shoulder joint External and internal rotation , Movements of elbow joint Flexion and extension, Movements of forearm Pronation and supination [12 hrs].

	Bones and joints of the vertebral column and Lower limb , Femur , Shaft of the femur , Patella , Tibia and fibula , Metatarsal bones [12 hrs]. Muscle tissue- structure, contraction and innervation of skletetal muscle, cardiac and smooth muscles, nervous tissue- histogenesis, cells, synapses, nerve fibers, nerves, ganglia, membranes and vessels of the CNS, blood-brain-barrier, cytoarchitecture of the spinal cord, cerebellum and cerebrum. The heart, the conducting system, its blood supply.[12hrs] Arteries and veins of the and abdominal pelvis and lower limb , femoral artery Branches, Profunda Femoris Artery, Arteriala nastomosis in the ll , Cannulation of femoral artery, Popliteal artery , Genicular anastomosis , Veins of the l.l , Superficial veins :great saphenous vein , Venae comitantes , Perforating veins , Varicose veins , Deep vein thrombosis (DVT. [20 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module encourage students' participation Dissection of rats and handling of dyes an laboratory slides,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.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	1, 6, 7
	Assignment	2	10% (10)	2, 12	1, 6, 7
	Projects / Lab.	1	10% (10)	Continuous	1, 6, 7
	Report	1	10% (10)	13	1, 6, 7
Summative assessment	Midterm Exam	2hr	10% (10)	7	1, 6, 7
	Final Exam	2hr	50% (50)	16	1, 6, 7
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the anatomy of thorax,Thoracic cage organization, the sternum, the ribs and thoracic vertebrae,
Week 2	Irregular bones - general features e.g. vertebrae , Flat bones - general features e.g. scapula, sternum and ribs , Gross anatomy of bone , Clavicle , Scapula
Week 3	Bones and joints of the trunk , Skeleton , Function of bones , Identifying characteristics , Classification of bones
Week 4	Thoracohumeral muscles , Superficial (first) layer of back muscles , Shoulder girdle muscles , Rotator cuff , Incisura scapulae Suprascapular notch , Incisura spinoglenoidalis, Trigonum clavipectorale / deltopectorale
Week 5	the intercostals space and articulation of the thoracic cage, Functional anatomy of respiration and diaphragm
Week 6	pulmonary trunk, and major veins the mediastinum, autonomic nervous system in the thorax, pleura and lungs, lymph drainage
Week 7	Mid-term Exam
Week 8	the heart, pericardium and surfaces of the heart, the heart chambers, the coronary arteries, vein of the heart, the conductive system, aorta
Week 9	muscles of the antero-lateral abdominal wall, the inguinal region, Bones and joints of the vertebral column
Week 10	muscles and joints of the back, bony pelvis, ligaments and sex differences, muscles and fascia of pelvic walls and floor
Week 11	the liver and biliary passages, the pancreas and the spleen
Week 12	the kidney, suprarenal and ureter, posterior abdominal wall and diaphragm, vessels and nerves on the posterior abdominal wall, lymphatic of the abdomen

Week 13	the lumbar spine and anatomy of the intervertebral disc, muscles and joints of the back, bony pelvis, ligaments and sex differences
Week 14	duodenum, alimentary tract jejunum and ileum, the large intestine, arterial supply of the gut, venous drainage of the gut Arteries and veins of the abdominal pelvis , the peritoneum stomach, and
Week 15	muscles and fascia of pelvic walls and floor internal pelvic organs:rectum, anal canal and urinary bladder
Week 16	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Essentials of Anatomy, (7 th editions), by Valerie C. Scanlon, PhD, Tina Sanders	Yes
Recommended Texts	Snell's Clinical Anatomy by Regions, 10th Edition,by Lawrence E.Wineskl,PHD	Yes
Recommended 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.