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

Module Information
معلومات المادة الدراسية

Module Title	**Cell Biology**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BME-212**		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		

Module Level	2	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	engineering
Module Leader	Aref alsayad	**e-mail**	aref.alsayad@uowa.edu.iq
Module Leader's Acad. Title		**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**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	
Module Aims **أهداف المادة الدراسية**	1. To know the cell number, size, shape, and properties of cells and distinguish their characteristics. 2. To understand Chromosomes and Genes, Structure of a Chromosome 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 Structure of the Cell and Cell Organelles. 6. To Know the types of microscopes used in diagnosis.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion. 2. An ability to communicate effectively with a range of audiences. 3. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge
Indicative Contents **المحتويات الإرشادية**	Indicative content includes the following. Cell Division (Mitosis and Miosis) , Prophase, Metaphase, Anaphase, Telophase , Reduction or Maturation Division (Meiosis) [12 hrs] cartilage, hyaline, elastic and fibrocatilage, histogensis of cartilage ,Bone- cells, matrix, types of bones, bone histogenesis ,blood, cells, formed elements, hematopoiesis, stem cells, bone marrow, maturation of erythrocytes, maturation of granyolocytes, maturation of lymphocytes and monocytes, origin of platelets [12 hrs] Genetics (The Science of Heredity) Genes, Chromosomes, and the Genome , The Allele , Dominance, Recessiveness, and Codominance , Phenotype and Genotype , The Mendelian Rules , Autosomal Dominant Hereditary Transmission , Sex-linked Inheritance. [12 hrs] Exchange of Materials between the Cell and Its Environment Composition of the , Extracellular Fluid , Composition of the Intracellular Fluid , Membrane or Resting Potential of a Cel , Solid and Fluid TransportRenal system , reproductive systems. [20 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' Structure of the Cell and Cell Organelles and laboratory technique, 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 محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	48	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	52	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	4
Total SWL (h/sem) **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	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**	2 hr	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 of cell Number, Size, Shape, and Properties of Cells , Metabolism and the Generation of Energy , Reproduction and Life Expectancy , Sensitivity to Stimulation and Response to Stimulation
Week 2	Structure of the Cell and Cell Organelles , Cell Membrane , Cytoplasm and Cell Organelles, Endoplasmic Reticulum (ER) , Ribosomes, Golgi Apparatus
Week 3	Lysosomes , Centrioles , Mitochondria , The Cell Nucleus
Week 4	Chromosomes and Genes, Structure of a Chromosome , The Genetic Code , Protein Synthesis , Duplication of Genetic Material (Replication)
Week 5	Cell Division (Mitosis and Miosis) , Prophase, Metaphase, Anaphase, Telophase , Reduction or Maturation Division (Meiosis)
Week 6	First maturation division , Second maturation division , The result of the two maturation divisions = mature sex cells , Prophase II , Metaphase II , Anaphase II , Telophase II
Week 7	Mid-term Exam
Week 8	Exchange of Materials between the Cell and Its Environment Composition of the , Extracellular Fluid , Composition of the Intracellular Fluid , Membrane or Resting Potential of a Cel , Solid and Fluid Transport
Week 9	Diffusion , Osmosis and Osmotic Pressure , Filtration , Active Transport , Endocytosis and Exocytosis
Week 10	Genetics (The Science of Heredity) Genes, Chromosomes, and the Genome , The Allele , Dominance, Recessiveness, and Codominance , Phenotype and Genotype , The Mendelian Rules , Autosomal Dominant Hereditary Transmission , Sex-linked Inheritance
Week 11	X Chromosome-linked Dominant Inheritance , X Chromosome-linked Recessive Inheritance , Mutations , Gene Mutations , Chromosome Mutations , Genome Mutations
Week 12	Epithelial Tissue and connective tissue , Surface Epithelia , Cell Junctions , Glandular and Sensory Epithelia , Simple epithelial tissue , Stratified tissue , Shape of epithelial tissue , Connective tissue Function , Connective Tissue Cells
Week 13	Intercellular Matrix (Ground Substance) , Loose Areolar (Interstitial) Tissue , Dense Fibrous White Connective Tissue , Adipose (Fatty) Tissue , Cartilaginous Tissue , Bone Tissue
Week 14	Nervous and Muscles tissue , Smooth Muscle Tissue , Striated Muscle Tissue , Cardiac Muscle Tissue
Week 15	The Neuron , The Nerve Impulse (Action Potential) , The Synapse , The Glia Cells (Neuroglia)
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Cytology (7th editions) by Silva Anderus A L (ed.).	Yes
Recommended Texts	Human Biology (6 th editions), by John Recharged	yes
Websites	https://libgen.me/book/ed0b6954e2617c88bdd0e1a8d335eaf7	

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	**Materials Science**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BME-214**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	BME		**College**	ENG	
Module Leader	Ahmed Hadi Abdulameer AlYasari		**e-mail**	a.alyasari@uokerbala.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	13/12/2025		**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. Identify engineering materials, especially biological materials, that are in contact with the body of a living organism. 2. Identify the types of bonding between atoms of matter 3. Identify space lattice of metals 4. Calculations related with space lattice of metals 5. Mechanical properties of materials 6. Polymers: its types, properties and applications 7. Ceramics: its types, properties and applications 8. Composite materials.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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. 5. The ability to analyze and discover the problem or error and the ability to find a solution to the error.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. -**Introduction into materials science** Materials Science and Engineering. Why Study Materials Science? Classification of Materials Primary and secondary bonds. Atomic Structure Number of atoms Atomic Bonding in Solids Types of bonds in materials Types of atomic and molecular bonds Metal-crystal network. Atomic or Ionic Arrangements Crystal Structures of metals The Face-Centered Cubic (FCC) Crystal Structure

	The Body-Centered Cubic Crystal Structure (B.C.C). The Hexagonal Close-Packed Crystal Structure (HCP). Density Computations—metals Single Crystals Polycrystalline Materials Nanocrystalline Solids (Amorphous) (16hrs) - **Introduction into Mechanical behavior** Tensile testing Engineering Stress-Strain Curve Shear testing Hardness Fatigue test Some problems (8hrs) - **Introduction into Polymer** Fundamentals of Polymer Science and Technology Importance of polymers Polymerization Degree of Polymerization and Molecular Weight Linear, Branched, and Cross-Linked Polymers Network Polymers Copolymers Arrangements of polymer unite (mers) Crystallinity Polymer Crystals Plastics (12hrs) - **Introduction into Ceramics** Classification of ceramic materials Properties of ceramics: Structures of Crystalline Ceramics Types of ceramics A-Traditional Ceramics B-New Ceramics Glass Methods of producing ceramics: Bio ceramics

	Examples for Bio ceramics (12hrs) - **Introduction into Composites materials** Technology and Classification of Composite Materials Metal Matrix Composites Ceramic Matrix Composites Polymer Matrix Composites (8hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1.Giving lectures and solving mathematical problems, if any, on the board. 2. Use of modern technologies and display videos and practical means of electronic display (Data Show) to illustrate the shapes and drawings and diagrams and vocabulary lecture. 3. Focusing on students' participation in the lecture by asking questions, eliciting new ideas and finding other ways to solve mathematical problems. 4- Adopting the homework method to solve the exercises by the students and evaluating their solutions in the classroom.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction into materials science Materials Science and Engineering. Why Study Materials Science? Classification of Materials
Week 2	Primary and secondary bonds. Atomic Structure Number of atoms Atomic Bonding in Solids Types of bonds in materials Types of atomic and molecular bonds
Week 3	Metal-crystal network. Atomic or Ionic Arrangements Crystal Structures of metals The Face-Centered Cubic (FCC) Crystal Structure The Body-Centered Cubic Crystal Structure (B.C.C).
Week 4	The Hexagonal Close-Packed Crystal Structure (HCP). Density Computations—metals Single Crystals Polycrystalline Materials

	Nanocrystalline Solids (Amorphous)
Week 5	Introduction into Mechanical behavior Tensile testing Engineering Stress-Strain Curve Shear testing
Week 6	Hardness Fatigue test Some problems
Week 7	Mid-term Exam
Week 8	Introduction into Polymer Fundamentals of Polymer Science and Technology Importance of polymers Polymerization
Week 9	Degree of Polymerization and Molecular Weight Linear, Branched, and Cross-Linked Polymers Network Polymers Copolymers
Week 10	Arrangements of polymer unite (mers) Crystallinity Polymer Crystals Plastics
Week 11	Introduction into Ceramics Classification of ceramic materials Properties of ceramics:
Week 12	Structures of Crystalline Ceramics Types of ceramics A-Traditional Ceramics B-New Ceramics
Week 13	Glass Methods of producing ceramics: Bio ceramics Examples for Bio ceramics

Week 14	Introduction into Composites materials Technology and Classification of Composite Materials
Week 15	Metal Matrix Composites Ceramic Matrix Composites Polymer Matrix Composites
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Sample Preparation for Microscopic Inspection
Week 2	Lab 2: Microscopic Inspection for specimen
Week 3	Lab 3: Tensile Test
Week 4	Lab 4: Hardness Test
Week 5	Lab 5: Fatigue test
Week 6	Lab 6: Impact Test
Week 7	Lab 7: Properties of Engineering Materials with Regular Shapes -Bulk density - Specific weight: - The porosity

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- (Engineering metallurgy, part 1) Higgins, Raymond A.- Engineering Metallurgy - Applied Physical Metallurgy- Elsevier (1993). 2- (Engineering metallurgy, part 2) Higgins, Raymond A.- Engineering Metallurgy - Applied Physical Metallurgy- Elsevier (1993).	No

Recommended Texts	1-The Science and Engineering of Materials, Seventh Edition, Donald R. Askeland, University of Missouri—Rolla, Emeritus, Wendelin J. Wright, Bucknell Univers, 2016. 2-Materials Science and Engineering An Introduction, William D. Callister, Jr. and David G. Rethwisch, 2010	No
Websites	/https://www.sanfoundry.com	

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.

Unit Description Form

Course Description Form

Faculty of Engineering / Department of Biomedicine

Unit Information Course Information					
Unit Title	**Mathematics III**			**Unit delivery**	
Unit Type	**Basic**			**نظريه** ☒ **حاضر** ☒ **المختبر** ☐ **تعليمي** ☐ **عملي** ☐ ☐ **Seminar**	
Unit Code	ENG201				
ECTS Credits	6				
SWL (ساعة / SEM)	150				
Unit level	2		**Delivery Semester**	1	
Administrative Management	**Biomedical Engineering**		**College**	**Faculty of Engineering**	
Unit Commander	**Salwan Ali Habeeb**		**E-mail Address**	Salwan.ali@uowa.edu.iq	
Title of Unit Commander	teacher		**Unit Commander Qualifications**	Doctor	
Unit Teacher			**E-mail Address**		
Peer Reviewer 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	Mathematics II	**Semester**	2
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 objectives of the Mathematics Unit aim to develop a deep understanding of basic mathematical concepts and their practical applications. Emphasis is placed on enhancing students' analytical and logical thinking skills through problem solving and the use of appropriate mathematical methods. The module also aims to teach students how to represent and analyze data using mathematical tools such as graphs and equations. The unit also seeks to develop the ability to apply mathematical concepts in multiple fields such as engineering, physics, and economics, helping to connect mathematics to everyday life and other sciences. In addition, students are encouraged to use modern technologies such as mathematical software to facilitate mathematical calculations and modeling, enhancing their academic and professional competence.

Unit Learning Outcomes Learning outcomes of the course	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.
Indicative Contents Indicative Contents	The instructional contents of the Mathematics module include a set of basic topics aimed at building a solid base of mathematical concepts. The module begins by reviewing basic principles of algebra, such as arithmetic, equations, and inequities, with a focus on solving linear and quadratic equations. The module also includes the study of basic geometry, including geometric shapes, measurements, and geometric theories such as the Pythagorean theorem, as well as the applications of geometry in solving practical problems. The basics of calculus, including derivatives and integrals and their applications in the study of variations and their rates, are discussed. Contents include the study of statistics and probability, where students are taught how to collect, analyze, and represent data using graphs and tables. Emphasis is also placed on solving problems using mathematical models and digital technologies such as custom software. The module concludes with practical applications that link mathematical concepts to everyday life and specialized fields such as physics, economics, and engineering, enhancing students' understanding of the role of mathematics in explaining phenomena and solving real-world challenges.

Learning and Teaching Strategies
Learning and Teaching Strategies

Strategies	The teaching strategy in the Mathematics module is based on combining theoretical explanation with practical application to ensure a deep understanding of the concepts. Real-life examples are used and linked to life problems to illustrate the importance of mathematics and its applications. It also encourages interactive activities such as teamwork and problem solving, as well as the use of technology such as digital tools and mathematical software to enhance learning. Lessons conclude with periodic reviews and tests to assess students' comprehension of content.

Student Workload (SWL)
The student's academic load is calculated for 15 weeks

Structured SWL (h / sem) Regular academic load of the student during the semester	78	**SWL regulator (h / w)** Regular student load per week	6
Unstructured SWL (h / sem) Irregular academic load of the student during the semester	72	**Unregulated SWL (h/w)** Irregular student academic load per week	4
Total SWL (h / sem) The student's total academic load during the semester	150		

Unit Evaluation
Course Evaluation

As		Time/Number	Weight (tags)	Week due	Related learning outcomes
Formative Assessment	**Quizes**	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.				

	Attendends	1	10% (10)	13	LO #5 , 8 and 10
Final Assessment	**Midterm Exam**	2 hr	20% (10)	5,12	LO #1-5,#6-11
	Final Exam	3 hours	50% (50)	16	All
Overall Rating			100% (100 degree)		

Delivery Plan (Weekly Syllabus) Theoretical Weekly Curriculum	
week	**Covered Material**
Week 1 **Week 2** **Week 3** **Week 4**	**Ordinary Differential Equations:** First order(variables separable,homogeneous, linear). Second order(Homogeneous and non-homogeneous). Higher order differential equations.
Week 5 **Week 6** **Week 7**	**Partial Differentiation:** Function of two or more variables, Partial Derivative.
Week 8 **Week 9** **Week 10**	**Laplace Transform:** Unit step function, Definition of L.T. and properties. Inverse Laplace Transform, Partial Fractions,solution of differential equations using Laplace transform.
Week 11 **Week 12**	**Sequences and Series**: Sequences, Series, Geometric series, etc.
Week 13 **Week 14** **Week 15**	**Fourier Series:** Periodic Function, Fourier series, Even and Odd Function, Complex notation for Fourier series.
Week 16	Preparatory week before the final Exam.

Learning and Teaching Resources

Learning and Teaching Resources

	text	Available in the library?
Required texts	Erwin Kreyszig,"Advanced Engineering Mathmatics", 10 Ed.	Yes
Recommended texts	1. George B. Thomas Jr.," CALCULAS",14 th Ed. 2. Schaum's Outline of College Mathematics, 4 th Ed. 3. Mary Attenborough, "Mathematics for Elicteical Engineering and Computing", 1 st Ed.	Yes
Websites	Topics in Calculus - Wolfarm Mathworld.	

Grading chart

Grading chart

group	degree	Appreciation	Tags (%)	definition
Success 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.

	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	Medical Informatics			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BME-213				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	Two		**Semester of Delivery**	3	
Administering Department	BME		**College**	ENG	
Module Leader	Alaa Akram Jawad		**e-mail**	alaa.ak@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	1/6/2025		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	Computer Science 1	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	The goal of this one-semester course is to provide the students with a broad overview on "Health Informatics" with focus on electronic health services provided by different kinds of software application. This improves the ability to managing electronic health systems, such as the HER, PACS, HIS, ...etc.
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 develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion. 3. 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.
Indicative Contents	Indicative content includes the following. **Part A - Theory** This semester constitutes the lecture notes to provide undergraduate students of biomedical engineering, the background knowledge of the structure of different health care systems. **Part B - Laboratory** In this part, we will investigate a sample system of cach of the given systems in the theoretical part. We recommend to select an open source health care systems to be demonstrated in the lab.

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)	63	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	12	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	75		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10,14	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2,8, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	0	-	-	-
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hrs.	10% (10)	7	LO # 1-7
	Final Exam	2 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to the Health information technology (HIT) and health care systems,
Week 2	PHI (protected or personal health information)
Week 3	Electronic health records (EHRs) systems
Week 4	Personal health records (PHRs) systems
Week 5	Electronic prescribing (E-prescribing) system
Week 6	Clinical decision support system (CDSS)
Week 7	Clinical decision support system (CDSS)
Week 8	Hospital information systems (HIS)
Week 9	Hospital information systems (HIS)
Week 10	picture archiving systems (PACS)
Week 11	picture archiving systems (PACS)
Week 12	Computer Aided Diagnosis (CAD)
Week 13	Medical image processing
Week 14	Molecular bioinformatics
Week 15	Molecular bioinformatics
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Lab 1: Electronic health records (EHRs) system demonstration.
Week 2	Lab 1: Electronic health records (EHRs) system demonstration.
Week 3	Lab 2: Personal health records (PHRs) system demonstration.
Week 4	Lah 2: Personal health records (PHRs) system demonstration.
Week 5	Lab3: Electronic prescribing (E-prescribing) system demonstration.
Week 6	Lab3: Electronic prescribing (E-prescribing) system demonstration.
Week 7	Lab 4: Hospital information systems (HIS) system demonstration.
Week 8	Lab 4: Hospital information systems (HIS) system demonstration.
Week 9	Lab 5: picture archiving systems (PACS) system demonstration.
Week 10	Lab 5: picture archiving systems (PACS) system demonstration.
Week 11	Lah 6: Computer Aided Diagnosis (CAD) system demonstration.
Week 12	Lab 6: Computer Aided Diagnosis (CAD) system demonstration.
Week 13	Lab 7: Medical image processing system demonstration.
Week 14	Lab 7: Medical image processing system demonstration.

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Biomedical Information Technology, by David Dagan Feng	Yes
Websites	Health IT and EHR (https://www.techtarget.com/)	

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.			

Module Description Template

course description

College of Engineering

Department of Biomedical engineering

Course Information

Article Title	**Engineering Mechanics**		**Module Delivery**	
Material Type	**basic**		☒ **Theoretical** ☒ **Lecture** ☐ **Laboratory** ☒ **Discussion** ☐ **practical** ☐ **Seminar**	
Article Code	BME-213			
Number of Credit Hours according to ECTS	**4**			
SWL (Hours/Semester)	**60**			
Material Level	3	**Semester**	3	
Department	BME	**College**	Engineering	
Subject Professor	Hussein Amir Muhammad Ali	**Email**	hussein.aljawad@uowa.edu.iq	
Academic Title of the Subject Professor	Assistant Lecturer	**Academic achievement**	MSc	
Name of the unit instructor (if applicable)		Email		
Name of peer references		Email		
Date of approval of the Scientific Committee		Issue Number		

Relationship with other subjects

Course Requirements	without	**Chapter**	
Common Material Requirements	without	**Chapter**	

Course Objectives, Learning Outcomes, and Instructional Contents	
Course Objectives	Building and psychologically preparing the student to carry out his role as an engineer
Learning Outcomes for the Course	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 processes 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.
How-to Contents	

Learning and Teaching Strategies	
Strategies	The main strategy that will be followed in the presentation of this module is to encourage students to participate in exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classrooms, interactive lessons and by looking at some kind of simple experiments involving some sampling activities that are of interest to students.

The student's academic load is calculated for 15 weeks			
Student's regular academic load during the semester	60	**Regular Academic Load of the Student Weekly**	4
Student's irregular academic load during class		**Student's irregular academic load per week**	
The student's total academic load during the semester	60		

Assessment of the course

		Time/Count	Weight (Grade)	The week	Relevant Learning Outcomes
Formative Assessment	Tests	2	10% (10)	5, 10	1&2
	Tasks	2	10% (10)	2, 12	1&2
	Projects .	1	10% (10)	Continuous	
	The Report	1	10% (10)	13	LO # 5, 8 and 10
Final Evaluation	Mid-Term Exam	2	10% (10)	7	LO # 1-7
	Final Exam	2	50% (50)	16	All
Kidney			100% (100 °)		

Theoretical Weekly Curriculum

	Covered Material
Week 1	Introduction to Dynamics
Week 2	Straight Motion
Week 3	Flat curved motion
Week 4	Vertical and tangential coordinates (n-t)
Week 5	Polar coordinates (r-θ)
Week 6	Relative Motion
Week 7	MID Exam 1
Week 8	Restricted movement of connected particles
Week 9	Labour and Energy
Week 10	Potential Energy
Week 11	Impact
Week 12	Pulsed momentum
Week 13	Energy and Momentum Conservation
Week 14	Static Mass Flow
Week 15	MID 2 Exam
Week 16	A preparatory week before the final exam

Learning and Teaching Resources

	Source	Library Availability
Required Source	Engineering Mechanics: Dynamics, (14th edition, by R. C. Hibbeler	Yes

Recommended Source	ENGINEERING MECHANICS: DYNAMICS, (5th editions), by J. L. MERIAM and L. G. KRAIGE.	Yes
Website	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Chart

Collection	**Recognition**	Recognition	**Grade (%)**	**Definition**
Success (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	Good work with noticeable errors
	D - Satisfactory	**Medium**	60 - 69	Acceptable but with major flaws
	E - Sufficient	**Acceptable**	50 - 59	Work meets minimum standards
Failure (0 – 49)	**FX –** Fail	**Deposit (in processing)**	(45-49)	More work is required but recognition has been awarded
	F – Fail	**Failure**	(0-44)	A great deal of work is required

Note: Decimal scores above or below 0.5 will be rounded to the highest or lowest full score (e.g., 54.5 will be rounded to 55, while 54.4 will be rounded to 54. The University has a zero-tolerance policy for "near-success failures", so the only adjustment to the marks awarded by the original proofreaders will be the automatic rounding described above.

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Ba'ath Party Crimes			**Module Delivery**	
Module Type	Secondary			☒ **Theory** ☒ **Lecture** ☐ **Lab** **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BME-112				
ECTS Credits	2				
SWL (hr/sem)	30				
Module Level			**Semester of Delivery**	1	
Administering Department	BME		**College**	ENG	
Module Leader	Zahraa sahib mohammed		**e-mail**	Zahraa.sahib@uowa.edu.iq	
Module Leader's Acad. Title	Assistant teacher		**Module Leader's Qualification**	Master's	
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. 1. Introducing students to the historical and legal background of the Ba'ath Party era in Iraq. 2. 2. Analyzing the nature of the crimes and violations committed by the party in light of national laws and international human rights standards. 3. 3. Enabling students to understand the legal framework of criminal accountability for those crimes under Iraqi legislation and the competent courts. 4. 4. Enhancing students' ability to distinguish between political crimes and crimes against humanity according to contemporary legal concepts. 5. 5. Equipping students with the skills to analyze legal texts and historical documents related to the crimes of the former regime. 6. 6. Developing students' legal and human rights awareness regarding the importance of transitional justice and reparations for the victims of that period.
Module Learning Outcomes	1. An ability to communicate effectively with a range of audiences. 2. 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.
Indicative Contents	The instructional content includes the following: 1. A historical overview of the emergence and development of the Ba'ath Party in Iraq. 2. Ba'athist ideology and its impact on the structure of the state and society. 3. Political executions and physical liquidations. 4. Crimes of torture and arbitrary detention within security and intelligence agencies. 5. Forced displacement of families (Feyli Kurds, sectarian displacement). 6. Genocidal crimes (Anfal campaign, mass graves). 7. The use of chemical weapons (Halabja as a case study).

Learning and Teaching Strategies	
Strategies	The student's workload is distributed over fifteen weeks through attending theoretical lectures and participating in classroom discussions aimed at reinforcing the legal and historical understanding of the course subject. The student is expected to complete readings and homework assignments that enhance the knowledge acquired in class, in addition to preparing a short report or research paper that develops analytical and research skills. The workload also includes group work that contributes to improving communication and teamwork abilities. At the end of the semester, the student prepares for the examinations by reviewing lectures and sources and by comprehending the core concepts of the course.

Student Workload (SWL)			
Structured SWL (h/sem)	93	**Structured SWL (h/w)**	6
Unstructured SWL (h/sem)	57	**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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	attendance	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	Violations of rights and freedoms.
Week 2	Descriptive overview of political regimes in Iraq (1921–2003).
Week 3	Violations of public rights and freedoms by the Ba'athist regime.
Week 4	Impact of Ba'athist regime behaviors on society and its domination over the state.
Week 5	Effect of the transitional period in combating authoritarian politics.
Week 6	The psychological domain, the social domain.
Week 7	Midterm examination.
Week 8	Religion and the state.
Week 9	Culture, media, and militarization of society.
Week 10	Impact of repression and wars on the environment and population.
Week 11	Use of internationally prohibited weapons and environmental pollution.
Week 12	Scorched earth policy.
Week 13	Draining of marshlands and forced migration.
Week 14	Destruction of agricultural and animal environments and radioactive contamination.
Week 15	Preparatory week before the final exam.

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Curriculum on the Crimes of the Former Banned Ba'ath Party	Yes
Recommended Texts		No
Websites		

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.			

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Electronic Circuits I			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BME-211				
ECTS Credits	7				
SWL (hr/sem)	175				
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	1. Develop problem-solving skills and an understanding of electronic circuits through practical application. 2. Understand the analysis and application of diode circuits. 3. Understand scissor, clamp, and Zener circuits. 4. This course covers the fundamental concepts of electronic circuits. 5. Understand and analyze the main types of transistors. 6. Perform series-connection analysis of transistors.
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 develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion.
Indicative Contents	Indicative content includes the following. Semiconductors: N-type, P-type, P-N junction, V-I characteristics, diode applications, half-wave rectifier, full-wave rectifier, power supply with filters and regulators, clippers, clamps, Zener diode: construction, characteristics and circuitry, applications, other types of diodes: variable diodes, current-regulating diode, tunneling diode, shock diode, PIN diode, bipolar junction transistor (BJT): transistor structure, BJT connection configuration, bias, characteristics, amplification parameters, DC load line, waveform distortion and Q-point, BJT switching operation, BJT amplifier operation, H parameters, equivalent circuits for CC, CB, and C.E. with their circuit applications.

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)	93	**Structured SWL (h/w)**	6
Unstructured SWL (h/sem)	57	**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)	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	Semiconductors: N-type, P-type, P-N junction, V-I characteristics
Week 2	Diode applications, half-wave rectifier, full-wave rectifier
Week 3	Parameters, DC load line, Q-point and waveform distortion
Week 4	Power supplies with filters and regulators, clippers, clampers
Week 5	Zener diode: construction, characteristics, circuitry and applications
Week 6	Bipolar junction transistor (BJT): transistor structure
Week 7	Midterm exam
Week 8	BJT connection configuration, bias, characteristics, and amplification
Week 9	BJT switching operation
Week 10	BJT amplifier operation
Week 11	H parameters, equivalent circuits
Week 12	H parameters, equivalent circuits for C.C.
Week 13	H parameters, equivalent circuits for C.B.
Week 14	H parameters, equivalent circuits for CE with their circuit applications
Week 15	Darlington amplifier
Week 16	Preparation week before the final exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Diode characteristics
Week 2	Types of diode
Week 3	Rectifiers and filters
Week 4	Clippers, clippers, and voltage amplifiers
Week 5	Zener diode as a voltage regulator
Week 6	BJT characteristics and DC bias
Week 7	Common-emitter amplifier

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Boylestad, R.L., and Nashelsky, L., Electronic Devices and circuit Theory, 9th Ed., Pearson Education, Inc., 2013.	Yes
Recommended Texts	Floyd, Thomas L., Electronic devices: Electron Flow Version, 11th Ed., Pearson Education, Inc., 2012.	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
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