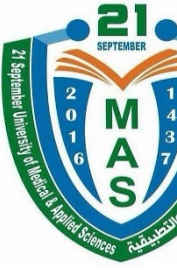




Republic of Yemen
Ministry of Education & Scientific Research
Council of Academic Accreditation & Quality
Assurance of Higher Education (CAQA)



21 septamber University for Medical and Applied Science

Faculty of Engineering and Computer
Department of Biomedical Engineering
Program of Biomedical Engineering

Course Specification of
Introduction to Biomedical Engineering
Course Code. (07.02.702)

2024



T4: This Template is Developed and Approved by CAQA-Yemen, 2023

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean:
Dr. Awadh Al-Kubati	Dr. ----	Dr. Awadh Al-Kubati	Dr. Mohammed Al-shamahi	Dr. Abdulrahman Obaid

I. General Information:

1	Course Title:	Introduction to Biomedical Engineering				
2	Course Code:	07.02.702				
3	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours	
			Lecture	Tutorial /Seminar	Lab	Clinical
		2	2	-	-	-
4	Level/ Semester at which this Course is offered:	1 st Level / 1 st Semester				
5	Pre –Requisite (if any):	N/A				
6	Co –Requisite (if any):	N/A				
7	Program (s) in which the Course is Offered:	Bachelor of Biomedical Engineering				
8	Language of Teaching the Course:	English				
9	Location of Teaching the Course:	Faculty of Medical Technology				
10	Prepared by:	Dr. Awadh Ali Mohammed				
11	Date and Number of Approval by Council:					

II. Course Description:

This course equips students with foundational knowledge in biomedical engineering technology, emphasizing the classification and operation of essential medical devices. It covers topics including diagnostic and life support equipment, medical imaging, and infection control techniques. The course focuses on practical applications, enabling students to understand and maintain various medical instruments, ensuring safety and effectiveness in healthcare environments.

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III. Course Intended Learning Outcomes (CILOs) : Upon successful completion of the course, students will be able to:			Referenced PILOs	
	A. Knowledge and Understanding:	I, P or M/A		
a1	Define fundamental terms such as "biomedical engineering," "essential devices," and "medical equipment."	I	A1	Explain the appropriate models, theories, mathematical foundations, and techniques related to biomedical engineering technology context.
a2	Describe different categories of medical equipment, including diagnostic, therapeutic, life support, and laboratory equipment, and explain their primary functions.	I	A4	Understand an examples of a biomedical engineering technology concept and methods related to maintenance, measurement techniques, programming, creative engineering solutions, analytical skills, applied to healthcare quality and problems of medical devices issues.
B. Intellectual Skills:				
b1	Provide a simple overview of the history and evolution of biomedical engineering and how essential devices have developed over time.	I	B2	Analyze the impacts of problems related to the Biomedical equipments and its solution principles in a creative manner by using a systematic and analytical thinking methods.
b2	Distinguish various diagnostic medical devices, such as the ECG and colonoscope, based on their descriptions and functions.	I	B3	Assess the features of biomedical devices systems, engineering diagnostic skills, technological expertise, and analytical methods that related to identify and addressing of biomedical devices systems failures.
C. Professional and Practical Skills:				
c1	Classify medical equipment into basic categories such as diagnostic, therapeutic, and life support using specific examples.	P	C1	Relate integrally knowledge of life science, biomedical engineering technology practice concepts, principles of engineering and techniques evaluation to solve problems relevant to biomedical

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				engineering.
c2	Apply the basic description of hygiene and sterilization procedures for handling medical equipment.	P	C4	Comply the basic skills in use of techniques, apply quality assurance procedures, and follow safety standards in maintenance procedures.
D. Transferable Skills:				
d1	Actively participate in group discussions on topics related to biomedical engineering, such as types of medical equipment and their benefits.	P	D1	Function effectively as an individual, team member, or leader in activities relevant to biomedical engineering, and collaborating to achieve a shared objective.
d2	Write a short report about a specific medical device, detailing its function, application, and relevance.	P	D3	Exhibit strong IT skills and communicate clearly, both verbally and in written technical reports.
I= Introduced, P=Practiced or M/A= Mastered/Advanced				

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Define fundamental terms such as "biomedical engineering," "essential devices," and "medical equipment."	<ul style="list-style-type: none"> Lectures Self-Learning 	<ul style="list-style-type: none"> Quizzes Mid-term Theoretical Exam Final Theoretical Exam
a2	Describe different categories of medical equipment, including diagnostic, therapeutic, life support, and laboratory equipment, and explain their primary functions.		

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1	Provide a simple overview of the history and evolution of biomedical engineering and how essential devices have	<ul style="list-style-type: none"> Lectures Discussions Reading Summaries 	<ul style="list-style-type: none"> Quizzes Mid-term Theoretical Exam Final Theoretical

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	developed over time.		
b2	Distinguish various diagnostic medical devices, such as the ECG and colonoscope, based on their descriptions and functions.		Exam

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Classify medical equipment into basic categories such as diagnostic, therapeutic, and life support using specific examples.	<ul style="list-style-type: none"> Lectures Self-Learning Presentation Q&A Sessions 	<ul style="list-style-type: none"> Mid-term Theoretical Exam Final Theoretical Exam Assignments Assessment
c2	Apply the basic description of hygiene and sterilization procedures for handling medical equipment.		

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
d1	Actively participate in group discussions on topics related to biomedical engineering, such as types of medical equipment and their benefits.	<ul style="list-style-type: none"> Self-Learning Group Study Activities Presentation 	<ul style="list-style-type: none"> Assignments Assessment
d2	Write a short report about a specific medical device, detailing its function, application, and relevance.		

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	Introduction	<ul style="list-style-type: none"> - Related definition and scope - History and evolution - Concepts of "Essential Devices" 	1	2	a1, b2
2	Classification of Medical Equipment	<ul style="list-style-type: none"> - Diagnostic equipment - Therapeutic equipment - Life support equipment - Medical monitors - Medical laboratory equipment - Challenges in Technical - Specifications of Medical Equipment 	1	2	a2, c1
3	Medical Diagnostic Devices	<ul style="list-style-type: none"> - Electroencephalography - Electrocardiograph, ECG - Colonoscope 	1	2	b1
4	Different Diagnostic Instruments	<ul style="list-style-type: none"> - Laryngoscope - Stethoscope - Sphygmomanometer - Medical Thermometer - Glucose meter 	1	2	b1
5 - 6	Life Support Equipment's	<ul style="list-style-type: none"> - Medical ventilators, - Heart - Lung machines, - ECMO (Extracorporeal membrane oxygenation), - Dialysis machines - Defibrillator 	2	4	a2, c1
7	Mid-term Exam	<ul style="list-style-type: none"> - All previous lectures 	1	2	a1, b1, b2, c1
8 - 9	Medical Imaging Equipment	<ul style="list-style-type: none"> - Medical Imaging Equipment - Ultrasound - Magnetic Resonance Imaging (MRI) - Computed Tomography Scanning System (CT scan) - Mammography unit 	2	4	a2, b1
10	Medical Laboratory	<ul style="list-style-type: none"> - Microscope 	1	2	a2, c1

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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
	Equipment's	<ul style="list-style-type: none"> - Centrifuge - Incubators - Spectrophotometer - Biological Safety cabinet 			
11-12	Infection Control, Sterilization and Care of Surgical Instruments	<ul style="list-style-type: none"> - Infection Control - Technique of infection control - Aseptic technique - Sterilization and Care of Surgical Instruments - Care and Handling - Sterilization and disinfection <ul style="list-style-type: none"> ▪ Heat Sterilization ▪ Chemical Sterilization ▪ Other Methods 	2	4	c2
13	Medical equipment's Used in Surgery, Anesthesia, Dentistry, ENT	<ul style="list-style-type: none"> - Operating Room Instruments - Electrosurgical Unit - Operating Table - Suction Apparatus - Anesthesia Machine - Operating room light - Operating Room Autoclaves - Dental Unit 	1	2	a2, c1
14	Ophthalmic Instruments	<ul style="list-style-type: none"> - Auto-Keratometer - Slit lamp - Ophthalmic operating microscope - Ophthalmoscope 	1	2	a2, b1
15	Orthopedic instruments	<ul style="list-style-type: none"> - Orthopedic instruments - Bone Chisel - Bone Mallet - Bone Cutter - Bone Holding Forceps - ENT Instruments - Aural speculum - Tracheal Dilating forceps - Sinus Forceps 	1	2	a2, c1

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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
		<ul style="list-style-type: none"> - Nasal scissors - Otoscope 			
16	Final Theoretical Exam	<ul style="list-style-type: none"> - All Course lectures 	1	2	a1, a2, b1, b2, c1, c2
Number of Weeks /and Units Per Semester			16	32	

B. Practical Aspect (Lab/Clinical) (if any):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	None			
2				
3	-			
4	-			
5	-			
Number of Weeks /and Units Per Semester				

C. Tutorial Aspect (if any):

No.	Tutorial	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	None			
2				
3				
4				
Number of Weeks /and Units Per Semester				

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignment 1: Report on a Specific Medical Device	9 th	3	c1, d1

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No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
2	Assignment 2: Classification of Medical Equipment	10 th	3	c1, d2
3	Assignment 3: Infection Control and Sterilization Techniques	15 th	4	c2, d1, d2
Total			10 %	

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	9, 10, 15	10	10 %	c1, c2, d1, d2
2	Quizzes 1 & 2	5, 11	10	10 %	a1, a2, b1, b2
3	Mid-Term Theoretical Exam	7	20	20 %	a1, b1, b2, c1
4	Final Theoretical Exam	16	60	60 %	a1, a2, b1, b2, c1, c2
Total			100	100 %	

IX. Learning Resources:

1- Required Textbook(s) (maximum two):

- 1- Enderle, J.D., Blanchard, S.M., Bronzino, J.D. (2020). Introduction to Biomedical Engineering. 4th Edition. Elsevier.
- 2- Webster, J.G. (2017). Medical Instrumentation: Application and Design. 5th Edition. Wiley.

2- Essential References:

- 1- Khandpur, R.S. (2014). Biomedical Instrumentation: Technology and Applications. McGraw-Hill.
- 1- Carr, J.J., Brown, J.M. (2018). Introduction to Biomedical Equipment Technology. 4th Edition. Pearson.
- 2- Pallás-Areny, R., Webster, J.G. (2019). Sensors and Signal Conditioning. 3rd Edition. Wiley.

3- Electronic Materials and Web Sites etc.:

Websites:

1. [IEEE Xplore](#)
2. [ScienceDirect](#)

Journals:

1. Journal of Biomedical Engineering
2. IEEE Transactions on Biomedical Engineering

Other Web Sources:

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1. [National Institutes of Health](#)
2. [World Health Organization](#)

X. Course Policies: (Based on the Uniform Students' By law (2007))

1	Class Attendance: Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	Tardiness: A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	Exam Attendance/Punctuality: No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	Assignments & Projects: Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	Cheating: Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	Forgery and Impersonation: Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	Other policies: The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

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Faculty of Medical Technology

Department of Biomedical Engineering

Program of Biomedical Engineering

Course Plan (Syllabus) of Introduction to Biomedical Engineering Technology

Course Code.

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member:		Office Hours					
Location & Telephone No.:	---						
E-mail:	-@-.-	SAT	SUN	MON	TUE	WED	THU

2024/2025

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II. Course Identification and General Information:

1	Course Title:	Introduction to Biomedical Engineering				
2	Course Code:	07.02.702				
3	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours	
			Lecture	Tutorial /Seminar	Lab	Clinical
		2	2	-	-	-
4	Level/ Semester at which this Course is offered:	1 st Level / 1 st Semester				
5	Pre –Requisite (if any):	N/A				
6	Co –Requisite (if any):	N/A				
7	Program (s) in which the Course is Offered:	Bachelor of Biomedical Engineering				
8	Language of Teaching the Course:	English				
9	Location of Teaching the Course:	Faculty of Medical Technology				
10	Prepared by:	Dr. Awadh Ali Mohammed				
11	Date and Number of Approval by Council:					

1	Course Title:	Introduction to Biomedical Engineering				
2	Course Code:	07.02.702				
3	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours	
			Lecture	Tutorial /Seminar	Lab	Clinical

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		2	2	-	-	-
4	Level/ Semester at which this Course is offered:	1 st Level / 1 st Semester				
5	Pre –Requisite (if any):	N/A				
6	Co –Requisite (if any):	N/A				
7	Program (s) in which the Course is Offered:	Bachelor of Biomedical Engineering				
8	Language of Teaching the Course:	English				
9	Location of Teaching the Course:	Faculty of Medical Technology				
10	Prepared by:	Dr. Awadh Ali Mohammed				
11	Date and Number of Approval by Council:					

III. Course Description:

This course equips students with foundational knowledge in biomedical engineering technology, emphasizing the classification and operation of essential medical devices. It covers topics including diagnostic and life support equipment, medical imaging, and infection control techniques. The course focuses on practical applications, enabling students to understand and maintain various medical instruments, ensuring safety and effectiveness in healthcare environments.

IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

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		O b j e c t i v e s
a1	Define fundamental terms such as "biomedical engineering," "essential devices," and "medical equipment."	
a2	Describe different categories of medical equipment, including diagnostic, therapeutic, life support, and laboratory equipment, and explain their primary functions.	
		B i n t e l l e c t u a l S k i l l s

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		:
b 1	Provide a simple overview of the history and evolution of biomedical engineering and how essential devices have developed over time.	
b 2	Distinguish various diagnostic medical devices, such as the ECG and colonoscope, based on their descriptions and functions.	
		C · P r o f e s s i o n a l a n d P r a c t i c a l S k i l l s :
c1	Classify medical equipment into basic categories such as diagnostic, therapeutic, and life support using specific examples.	
c2	Apply the basic description of hygiene and sterilization procedures for handling medical equipment.	
		D · T

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d 1	Actively participate in group discussions on topics related to biomedical engineering, such as types of medical equipment and their benefits.
d 2	Write a short report about a specific medical device, detailing its function, application, and relevance.
I= Introduced, P=Practiced or M/A= Mastered/Advanced	

V. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	Introduction	<ul style="list-style-type: none"> - Related definition and scope - History and evolution - Concepts of "Essential Devices" 	1	2
2	Classification of Medical Equipment	<ul style="list-style-type: none"> - Diagnostic equipment - Therapeutic equipment - Life support equipment - Medical monitors - Medical laboratory equipment - Challenges in Technical - Specifications of Medical Equipment 	1	2
3	Medical Diagnostic Devices	<ul style="list-style-type: none"> - Electroencephalography - Electrocardiograph, ECG 	1	2

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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
		– Colonoscope		
4	Different Diagnostic Instruments	– Laryngoscope – Stethoscope – Sphygmomanometer – Medical Thermometer – Glucose meter	1	2
5 - 6	Life Support Equipment's	– Medical ventilators, – Heart - Lung machines, – ECMO (Extracorporeal membrane oxygenation), – Dialysis machines – Defibrillator	2	4
7	Mid-term Exam	All previous lectures	1	2
8 - 9	Medical Imaging Equipment	– Medical Imaging Equipment – Ultrasound – Magnetic Resonance Imaging (MRI) – Computed Tomography Scanning System (CT scan) – Mammography unit	2	4
10	Medical Laboratory Equipment's	– Microscope – Centrifuge – Incubators – Spectrophotometer – Biological Safety cabinet	1	2
11- 12	Infection Control, Sterilization and Care of Surgical Instruments	– Infection Control – Technique of infection control – Aseptic technique – Sterilization and Care of Surgical Instruments – Care and Handling – Sterilization and disinfection <ul style="list-style-type: none"> ▪ Heat Sterilization ▪ Chemical Sterilization ▪ Other Methods 	2	4
13	Medical equipment's Used in Surgery, Anesthesia, Dentistry, ENT	– Operating Room Instruments – Electrosurgical Unit – Operating Table – Suction Apparatus	1	2

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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
		<ul style="list-style-type: none"> - Anesthesia Machine - Operating room light - Operating Room Autoclaves - Dental Unit 		
14	Ophthalmic Instruments	<ul style="list-style-type: none"> - Auto-Keratometer - Slit lamp - Ophthalmic operating microscope - Ophthalmoscope 	1	2
15	Orthopedic instruments	<ul style="list-style-type: none"> - Orthopedic instruments - Bone Chisel - Bone Mallet - Bone Cutter - Bone Holding Forceps - ENT Instruments - Aural speculum - Tracheal Dilating forceps - Sinus Forceps - Nasal scissors - Otoscope 	1	2
16	Final Theoretical Exam	All Course lectures	1	2
Number of Weeks /and Units Per Semester			16	32

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	Introduction	<ul style="list-style-type: none"> - Related definition and scope - History and evolution - Concepts of "Essential Devices" 	1	2
2	Classification of Medical Equipment	<ul style="list-style-type: none"> - Diagnostic equipment - Therapeutic equipment - Life support equipment - Medical monitors - Medical laboratory equipment - Challenges in Technical - Specifications of Medical Equipment 	1	2
3	Medical Diagnostic	<ul style="list-style-type: none"> - Electroencephalography 	1	2

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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
	Devices	<ul style="list-style-type: none"> - Electrocardiograph, ECG - Colonoscope 		
4	Different Diagnostic Instruments	<ul style="list-style-type: none"> - Laryngoscope - Stethoscope - Sphygmomanometer - Medical Thermometer - Glucose meter 	1	2
5 - 6	Life Support Equipment's	<ul style="list-style-type: none"> - Medical ventilators, - Heart - Lung machines, - ECMO (Extracorporeal membrane oxygenation), - Dialysis machines - Defibrillator 	2	4
7	Mid-term Exam	<ul style="list-style-type: none"> - All previous lectures 	1	2
8 - 9	Medical Imaging Equipment	<ul style="list-style-type: none"> - Medical Imaging Equipment - Ultrasound - Magnetic Resonance Imaging (MRI) - Computed Tomography Scanning System (CT scan) - Mammography unit 	2	4
10	Medical Laboratory Equipment's	<ul style="list-style-type: none"> - Microscope - Centrifuge - Incubators - Spectrophotometer - Biological Safety cabinet 	1	2
11- 12	Infection Control, Sterilization and Care of Surgical Instruments	<ul style="list-style-type: none"> - Infection Control - Technique of infection control - Aseptic technique - Sterilization and Care of Surgical Instruments - Care and Handling - Sterilization and disinfection <ul style="list-style-type: none"> ▪ Heat Sterilization ▪ Chemical Sterilization ▪ Other Methods 	2	4
13	Medical equipment's Used in Surgery, Anesthesia, Dentistry, ENT	<ul style="list-style-type: none"> - Operating Room Instruments - Electrosurgical Unit - Operating Table - Suction Apparatus 	1	2

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No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
		<ul style="list-style-type: none"> - Anesthesia Machine - Operating room light - Operating Room Autoclaves - Dental Unit 		
14	Ophthalmic Instruments	<ul style="list-style-type: none"> - Auto-Keratometer - Slit lamp - Ophthalmic operating microscope - Ophthalmoscope 	1	2
15	Orthopedic instruments	<ul style="list-style-type: none"> - Orthopedic instruments - Bone Chisel - Bone Mallet - Bone Cutter - Bone Holding Forceps - ENT Instruments - Aural speculum - Tracheal Dilating forceps - Sinus Forceps - Nasal scissors - Otoscope 	1	2
16	Final Theoretical Exam	- All Course lectures	1	2
Number of Weeks /and Units Per Semester			16	32

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Number of Weeks	Contact Hours
1	None		
2			
3			
4			
5			
Number of Weeks /and Units Per Semester			

No.	Tasks/ Experiments	Number of Weeks	Contact Hours
1	None		
2			

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No.	Tasks/ Experiments	Number of Weeks	Contact Hours
3	-		
4	-		
5	-		
Number of Weeks /and Units Per Semester			

C. Tutorial Aspect:

No.	Tutorial	Number of Weeks	Contact Hours
1	None		
2			
3			
4			
Number of Weeks /and Units Per Semester			

VI. Teaching Strategies of the Course:

Error! Reference source not found.

VII. Assessment Methods of the Course:

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VIII. Assignments:

No.	Assignments	Week Due	Mark
1	Assignment 1: Report on a Specific Medical Device	9th	3
2	Assignment 2: Classification of Medical Equipment	10th	3
3	Assignment 3: Infection Control and Sterilization Techniques	15th	4
Total			10 %

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	9, 10, 15	10	10 %
2	Quizzes 1 & 2	5, 11	10	10 %
3	Mid-Term Theoretical Exam	7	20	20 %

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean:
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No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
4	Final Theoretical Exam	16	60	60 %
Total			100	100 %

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	9, 10, 15	10	10 %
2	Quizzes 1 & 2	5, 11	10	10 %
3	Mid-Term Theoretical Exam	7	20	20 %
4	Final Theoretical Exam	16	60	60 %
Total			100	100 %

X. Learning Resources:

- 1- Required Textbook(s) (maximum two):

Enderle, J.D., Blanchard, S.M., Bronzino, J.D. (2020). Introduction to Biomedical Engineering. 4th Edition. Elsevier.

3- Webster, J.G. (2017). Medical Instrumentation: Application and Design. 5th Edition. Wiley.

- 2- Essential References:

Khandpur, R.S. (2014). Biomedical Instrumentation: Technology and Applications. McGraw-Hill.

4- Carr, J.J., Brown, J.M. (2018). Introduction to Biomedical Equipment Technology. 4th Edition. Pearson.

5- Pallás-Areny, R., Webster, J.G. (2019). Sensors and Signal Conditioning. 3rd Edition. Wiley.

- 3- Electronic Materials and Web Sites etc.:

Websites:

IEEE Xplore

ScienceDirect

Journals:

Journal of Biomedical Engineering

3. IEEE Transactions on Biomedical Engineering

Other Web Sources:

3. [National Institutes of Health](#)

4. [World Health Organization](#)

XI. Course Policies: (Based on the Uniform Students' Bylaw (2007))

1

Class Attendance:

Class Attendance is mandatory. A student is considered absent and shall be banned

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	from taking the final exam if his/her absence exceeds 25% of total classes.
2	Tardiness: A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	Exam Attendance/Punctuality: No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	Assignments & Projects: Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	Cheating: Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	Forgery and Impersonation: Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	Other policies: The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

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