

Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES



Program Anesthesia Technician

Course Specification of Physics and measurmens 1

Course No. (08 03 840)

2024

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean
Dr. Sadek Al theely	Dr. abdulala thabet	Dr.Fares Mahdi	Dr.Fadl Shujaa Al-deen	Dr. Abdulsalam Dallak

Template for Course Specification

I. Course Identification and General Information:				
1	Course Title:	Physics and measurmens 1		
2	Course Code & Number:	08 03 840		
3	Credit Hours:	Credit Hours	Theory Hours	
			Lecture	Field
		2	2	--
4	Study Level/ Semester at which this Course is offered:	Level2\1term		
5	Pre –Requisite (if any):	None		
6	Co –Requisite (if any):	None		
7	Program (s) in which the Course is Offered:	Bachelor of Anesthesia Technician		
8	Language of Teaching the Course:	English		
9	Study System:	Semester Based System		
10	Mode of Delivery:	Full Time		
11	Location of Teaching the Course:	Faculty of Medical Applied Science		
12	Prepared by:	Associate Prof. Sadek Al theely		

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean
Dr. Sadek Al theely	Dr. abdulala thabet	Dr.Fares Mahdi	Dr.Fadl Shujaa Al-deen	Dr. Abdulsalam Dallak

	Date of Approval:	2024-1446 ^{Ah}
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II. Course Description:

Physics and Measurements 1 is an introductory course designed to explore fundamental principles of physics along with the significance and methods of measurement in science. The course will cover essential topics, equip students with problem-solving skills, and emphasize hands-on experimentation

III. Course Intended Learning Outcomes (CILOs) : (مخرجات تعلم المقرر)

A. Knowledge and Understanding: Upon successful completion of the course, students will be able to:

a1	Describe fundamental concepts of motion, force, energy, and momentum.	A1	. Recognize the knowledge from nursing science, other sciences and disciplines to make judgments relative to the practice of nursing that is based on research findings and evidence.
a2	Mentioned the principles governing physical phenomena and their real-world applications.	A4	Synthesize theories and concepts from liberal education to build an understanding of the human experience into nursing practice
a3	Explain of way Utilize various measurement techniques and tools for collecting data accurately and precisely.	A3	Recognize the full details about the basic physics and its applications in anesthesia, the equipment's and apparatus in anesthesia and critical care unit.

B. Intellectual Skills: Upon successful completion of the course, students will be able to:

b1	Perform dimensional analysis to ensure the consistency of physical equations.	B2	Value the ideal of lifelong learning to support excellence in nursing practice
b2	Analyze experimental results, including error analysis and uncertainty propagation.	B3	Utilize awareness, interest and contribute towards advancement of self and of the profession

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B3	Prepare clear and concise laboratory reports that effectively communicate experiment methodology, results, and interpretations.		
C. Professional and Practical Skills: Upon successful completion of the course, students will be able to:			
c1	Use dimensional analysis to verify the consistency of physical equations and perform unit conversions effectively.	C1	Practice as a professional nurse to facilitate human need fulfillment of individuals, families, groups, communities and populations across the lifespan in a variety of healthcare settings
c2	Collect, analyze, and interpret data to draw meaningful conclusions, recognizing the effect of errors and uncertainties.	C2	Apply concepts and skills of leadership, management, quality improvement and patient safety in the delivery of high-quality therapeutic nursing interventions for individuals, families, groups, communities
C3	Utilize mathematical reasoning and critical thinking to solve physics problems across various topics.		Apply concepts and skills of leadership, management, quality improvement and patient safety in the delivery of high-quality therapeutic nursing interventions for individuals, families, groups, communities
D. Transferable Skills: Upon successful completion of the course, students will be able to:			
d1	Communicate with the patient and his family effectively in professional manner using the principles of communication techniques	D1	Communicate effectively with individuals and groups and members of the health team in order to promote effective interpersonal relationships and teamwork
d2	Develop and apply appropriate formulas and concepts to analyze physical situations quantitatively.	D2	Demonstrate professional, ethical, moral, legal, and spiritual concepts into one's practice within a global environment

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(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	Describe fundamental concepts of motion, force, energy, and momentum.	- Interactive lecture - Seminars and student presentations - Brain storming, role-play and simulation - Small group for discussing	- Assignments - Quizzes - Mid-term Exam - Final exam - Presentations
a2	Mentioned the principles governing physical phenomena and their real-world applications.	- Interactive lecture - Seminars and student presentations - Brain storming, role-play and simulation - Small group for discussing	- Assignments - Quizzes - Mid-term Exam - Final exam - Presentations
A3	Explain of way Utilize various measurement techniques and tools for collecting data accurately and precisely.	- Interactive lecture - Seminars and student presentations - Brain storming, role-play and simulation - Small group for discussing	- Assignments - Quizzes - Mid-term Exam - Final exam - Presentations

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

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
b1	Perform dimensional analysis to ensure the consistency of physical equations.	- Interactive lecture - Brain storming - Role-play & simulation - Small group discussions - Seminars and student presentations	- Assignments - Quizzes - Mid-term Exam - Final exam

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b2	Analyze experimental results, including error analysis and uncertainty propagation.	- Interactive lecture - Brain storming - Role-play & simulation - Small group discussions - Seminars and student presentations	- Assignments - Quizzes - Mid-term Exam - Final 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	Use dimensional analysis to verify the consistency of physical equations and perform unit conversions effectively.	- Active learning, - Small group learning. - Learning tasks and activities	- Assignments - Quizzes - Mid-term Exam - Final exam
c2	Collect, analyze, and interpret data to draw meaningful conclusions, recognizing the effect of errors and uncertainties.	- Active learning, - Small group learning. - Learning tasks and activities	- Assignments - Quizzes - Mid-term Exam - Final exam
C3	Utilize mathematical reasoning and critical thinking to solve physics problems across various topics.	- Active learning, - Small group learning. - Learning tasks and activities	- Assignments - Quizzes - Mid-term Exam - Final exam
(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:			
	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
d1	Communicate with the patient and his family effectively in professional manner using the	Classroom discussions,	- Presentations - Case Studies

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	principles of communication techniques	- Problems solving - Case study analysis	Learning activities
d2	Discuss the legal and ethical issues that arise in the emergency care setting.	- Classroom discussions, - Problems solving - Case study analysis	- Presentations - Case Studies - Learning activities

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	Potential Topics for a Course	- Introduction to physics and its significance. - Detailed study of measurements and the importance of precision and accuracy. - An exploration of fundamental concepts in physics with an emphasis on measurement and experimentation.	6	12	a1,a2.a3. d2
2	Measurement:	Understanding the International System of Units (SI) is crucial. Common units include meters (m) for distance, kilograms (kg) for mass, seconds (s) for time, and	1	2	a1, b1.c2.c3.c1

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		newtons (N) for force. 2. Dimensional Analysis: - This involves checking the dimensions of physical equations to ensure they are consistent. It's a useful tool for converting units and solving problems. 3. Significant Figures: - This concept deals with the precision of measurements. When performing calculations, the number of significant figures must be maintained to reflect the precision of the measurements involved. 4. Measurement Tools and Techniques: - Familiarity with various instruments (like rulers, balances, and calipers) is essential. Each tool has its own level of precision and uncertainty. 5. Errors in Measurement: - Understanding systematic and random errors is crucial. Systematic errors can be reduced by calibration, while random errors can be minimized by taking multiple measurements and averaging them.			
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		6. Basic Physics Concepts: Kinematics (motion), dynamics (forces), energy, momentum, thermodynamics, and waves are foundational topics that build on measurement principles.			
		Mad exam	1	2	
6	Key Topics	1. Units and Measurement: - The metric system and SI units. - Conversion of units and application of significant figures. - Accuracy, precision, and error analysis in measurements. 2. Kinematics: - Motion in one and two dimensions. - Graphical analysis of motion. - Concepts of speed, velocity, and acceleration. 3. Dynamics: - Newton's laws of motion. - Understanding forces,	6	12	a1, b1.c2.c3.c1 d2

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		mass, and acceleration. ○ Applications of forces in various scenarios. 4. Work, Energy, and Power: ○ Work done by a force and its measurement. ○ Kinetic and potential energy. ○ Conservation of energy principles. 5. Momentum and Collisions: ○ Linear momentum and its conservation. ○ Types of collisions and their characteristics. 6. Thermodynamics (Introduction): ○ Concepts of temperature, heat, and energy transfer. ○ Basic laws of thermodynamics.			
7	Laboratory Component	Laboratory Component • Hands-on experiments to reinforce theoretical principles. • Data collection, analysis, and	3	6	a2, c2, d2

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		interpretation.			
		Emphasis on the scientific method and proper lab reporting			
8		•	3	6	a2, c2, d2.C3
	Final term exam	Final term exam	1	2	a2, b2, c2, d2
Number of Weeks /and Units Per Semester			16	32	

B. Case Studies and Practical Aspect:

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

C. Tutorial Aspect:

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

V. Teaching Strategies of the Course:

- Interactive lecture
- Seminars and student presentations
- Brain storming

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- Role-play and simulation
- Small group discussion
- Learning tasks and activities
- Problems solving
- Case study analysis

VI. Assessment Methods of the Course:

- Assignments
- Quizzes
- Mid-term exam
- Final term exam

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignment 1: common abbreviations	W5	5	a1, b1
2	Assignment 2: drug classification	W11	5	a2, b2,
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	W5,11	10	10%	a1, b1, a2, b2
2	Quizzes 1 & 2	W3, 9	10	10%	a1, a2
3	Mid-Term Theoretical Exam	W7	20	20%	a1, b1, c1, d1
4	Final Theoretical Exam	W16	60	60%	a2, b2, c2, d2

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Total	100	100%	
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IX. Learning Resources:

- *Written in the following order:* Author, Year of publication, **Title**, Edition, Place of publication, Publisher.

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

- "Measurement and Instrumentation: Theory and Application" by Alan S. Morris and Reza Malekian
- "Principles of Measurement and Instrumentation" by Alan S. Morris
- "Experimental Methods in the Physical Sciences" by William W. McMillan
- "The Art of Measurement: Theory and Practice" by Robert J. S. T. M. de Gouveia and Geert M. W. van der Heide.

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3- Electronic Materials and Web Sites etc.:

Websites:

1. "Introduction to Measurement: Accuracy, Calibration, and the General Principles of Measurement" by John F. Gibbons
2. "Physical Measurements: A Practical Guide" by David A. Smith
3. "Metrology: Principles and Applications" by D. J. E. B. Anne and S. M. J. Tan
4. "Modern Electronic Instrumentation and Measurement Techniques" by Albert D. Helfrick and William D. Cooper
5. "Measurement Science and Technology" (Journal) for articles on the latest advancements in measurement techniques and technology.
6. "Understanding the Measurement of Physical Quantities" by S. G. Krishnan and P. S. S. Ra

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

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:

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	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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21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIED

SCIENCES



Program Anesthesia Technician

Course Specification of Physics and measurements 1

Course No. (08 03 840)

2024

Template for Course Syllabus

15

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean
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i. معلومات عن أستاذ المقرر Information about Faculty Member Responsible for the Course							
(3 أسبوعيا)		الساعات المكتبية (أسبوعيا) Office Hours				Dr. Sadek Al theely	الاسم Name
الخميس THU	الأربعاء WED	الثلاثاء TUE	الاثنين MON	الأحد SUN	السبت SAT		المكان ورقم الهاتف Location & Telephone No.
							البريد الإلكتروني E-mail
I. Course Identification and General Information:							
1	Course Title:					Physics and measurmens 1	
2	Course Code & Number:					08 03 840	
3	Credit Hours:					Credit Hours	Theory Hours Lecture Field
						2	2 -- --
4	Study Level/ Semester at which this Course is offered:					Level2\term1	
5	Pre –Requisite (if any):					None	
6	Co –Requisite (if any):					None	
7	Program (s) in which the Course is Offered:					Bachelor of Anesthesia Technician	
8	Language of Teaching the Course:					English	
9	Study System:					Semester Based System	
10	Mode of Delivery:					Full Time	
11	location of teaching the course:					faculty of medical applied science	

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12	prepared by:	dr. Sadek Al theely
13	date of approval:	2024-1446 ^{ah}

ii. course description:

Physics and Measurements 1 is an introductory course designed to explore fundamental principles of physics along with the significance and methods of measurement in science. The course will cover essential topics, equip students with problem-solving skills, and emphasize hands-on experimentation.

course intended learning outcomes (ciolos)

a1	Describe fundamental concepts of motion, force, energy, and momentum.
a2	Mentioned the principles governing physical phenomena and their real-world applications.
a3	Explain of way Utilize various measurement techniques and tools for collecting data accurately and precisely.
b1	Perform dimensional analysis to ensure the consistency of physical equations.
b2	Analyze experimental results, including error analysis and uncertainty propagation.
c1	Use dimensional analysis to verify the consistency of physical equations and perform unit conversions effectively.
c2	Collect, analyze, and interpret data to draw meaningful conclusions, recognizing the effect of errors and uncertainties.
C3	Utilize mathematical reasoning and critical thinking to solve physics problems across various topics.
d1	Communicate with the patient and his family effectively in professional manner using the principles of communication techniques
d2	Discuss the legal and ethical issues that arise in the emergency care setting.

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CIOLs)
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1	Potential Topics for a Course	○ Introduction to physics and its significance. • Detailed study of measurements and the importance of precision and accuracy. ○ An exploration of fundamental concepts in physics with an emphasis on measurement and experimentation.	1	2	a1,a2.a3. d2
2	Measurement:	○ Understanding the International System of Units (SI) is crucial. Common units include meters (m) for distance, kilograms (kg) for mass, seconds (s) for time, and newtons (N) for force. 7. Dimensional Analysis: ○ This involves checking the dimensions of physical equations to ensure they are consistent. It's a useful tool for converting units and solving problems. 8. Significant Figures: ○ This concept deals with the precision of measurements. When performing calculations, the number of significant figures must be maintained to reflect the precision of the measurements involved.	1	2	a1, b1.c2.c3.c1

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		9. Measurement Tools and Techniques: - Familiarity with various instruments (like rulers, balances, and calipers) is essential. Each tool has its own level of precision and uncertainty. 10. Errors in Measurement: - Understanding systematic and random errors is crucial. Systematic errors can be reduced by calibration, while random errors can be minimized by taking multiple measurements and averaging them. 11. Basic Physics Concepts: - Kinematics (motion), dynamics (forces), energy, momentum, thermodynamics, and waves are foundational topics that build on measurement principles.			
		• Mad exam	1	2	
6	Key Topics	7. Units and Measurement: - The metric system and SI units. - Conversion of units and application of significant figures.	6	12	a1, b1.c2.c3.c1d2

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		- Accuracy, precision, and error analysis in measurements. 8. Kinematics: - Motion in one and two dimensions. - Graphical analysis of motion. - Concepts of speed, velocity, and acceleration. 9. Dynamics: - Newton's laws of motion. - Understanding forces, mass, and acceleration. - Applications of forces in various scenarios. 10. Work, Energy, and Power: - Work done by a force and its measurement. - Kinetic and potential energy. - Conservation of energy principles. 11. Momentum and Collisions: - Linear momentum and its conservation. - Types of collisions and their characteristics. 12. Thermodynamics (Introduction):			
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		- Concepts of temperature, heat, and energy transfer. - Basic laws of thermodynamics.			
7	Laboratory Component	Laboratory Component - Hands-on experiments to reinforce theoretical principles. - Data collection, analysis, and interpretation. - Emphasis on the scientific method and proper lab reporting	3	6	a2, c2, d2
8		•	3	6	a2, c2, d2.C3
	Final term exam	Final term exam	1	2	a2, b2, c2, d2
Number of Weeks /and Units Per Semester			16	32	

C. Tutorial Aspect:

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

V. Teaching Strategies of the Course:

- Interactive lecture
- Seminars and student presentations
- Brain storming
- Role-play and simulation

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- Small group discussion
- Learning tasks and activities
- Problems solving
- Case study analysis

VI. Assessment Methods of the Course:

- Assignments
- Quizzes
- Mid-term exam
- Final term exam

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignment 1: common abbreviations	W5	5	a1, b1
2	Assignment 2: drug classification	W11	5	a2, b2,
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	W5,11	10	10%	a1, b1, a2, b2

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2	Quizzes 1 & 2	W3, 9	10	10%	a1, a2
3	Mid-Term Theoretical Exam	W7	20	20%	a1, b1, c1, d1
4	Final Theoretical Exam	W16	60	60%	a2, b2, c2, d2
Total			100	100%	

IX. Learning Resources:

- *Written in the following order:* Author, Year of publication, **Title**, Edition, Place of publication, Publisher.

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

- "Measurement and Instrumentation: Theory and Application" by Alan S. Morris and Reza Malekian
- "Principles of Measurement and Instrumentation" by Alan S. Morris
- "Experimental Methods in the Physical Sciences" by William W. McMillan
- "The Art of Measurement: Theory and Practice" by Robert J. S. T. M. de Gouveia and Geert M. W. van der Heide.

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3- Electronic Materials and Web Sites etc.:

Websites:

7. "Introduction to Measurement: Accuracy, Calibration, and the General Principles of Measurement" by John F. Gibbons
8. "Physical Measurements: A Practical Guide" by David A. Smith
9. "Metrology: Principles and Applications" by D. J. E. B. Anne and S. M. J. Tan
10. "Modern Electronic Instrumentation and Measurement Techniques" by Albert D. Helfrick and

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William D. Cooper
11. "Measurement Science and Technology" (Journal) for articles on the latest advancements in measurement techniques and technology.
12. "Understanding the Measurement of Physical Quantities" by S. G. Krishnan and P. S. S. Ra
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○ "Measurement and Instrumentation: Theory and Application" by Alan S. Morris and Reza Malekian
○ "Principles of Measurement and Instrumentation" by Alan S. Morris
○ "Experimental Methods in the Physical Sciences" by William W. McMillan
○ "The Art of Measurement: Theory and Practice" by Robert J. S. T. M. de Gouveia and Geert M. W. van der Heide.
○
3- Electronic Materials and Web Sites etc.:
Websites:
13. "Introduction to Measurement: Accuracy, Calibration, and the General Principles of Measurement" by John F. Gibbons
14. "Physical Measurements: A Practical Guide" by David A. Smith
15. "Metrology: Principles and Applications" by D. J. E. B. Anne and S. M. J. Tan
16. "Modern Electronic Instrumentation and Measurement Techniques" by Albert D. Helfrick and William D. Cooper
17. "Measurement Science and Technology" (Journal) for articles on the latest advancements in measurement techniques and technology.
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○
3- Electronic Materials and Web Sites etc.:
Websites:

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

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	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.

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean
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