Course Specification of Toxicology and Forensic Medicine

I.	Course Identification and General Information:					
1	**Course Title:**	Toxicology and Forensic Medicine				
2	**Course Number & Code:**	IM463				
3	**Credit hours:**	**C.H**				**Total**
		Theoretical	**Practical**	**Training**	**Seminar**	
		2	1	0	0	3
4	**Study level/ semester at which this course is offered:**	Second Semester of Fourth Year				
5	**Pre –requisite (if any):**	ANT232, ANT234, PH345				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Veterinary Medicine				
8	**Language of teaching the course:**	English				
9	**Location of teaching the course:**	Faculty of Veterinary Medicine Building				
10	**Prepared by:**	Dr. Hussein Abdulhadi Nasser Al-Wadei				
11	**Date of approval:**					

II. Course description:

Forensic Medicine deals with the techniques applied in medical science for the purpose of law and Toxicology is about detecting and isolating of symptoms produced by a poison or toxin on living being (human, animal, etc.). Forensic Medicine will teach students how to define death and identify its types, determining the early and late stages of death and an in-depth study of a variety causing deaths such as homicide, malnutrition, diseases, starvation and accidents.

In toxicology, the students are familiarized with the general characteristics of various poisons, the toxic principle present in them, their mechanism of action, their fatal period and fatal dose, the signs and symptoms associated with each poison, the post-mortem appearances associated with them, their medico-legal aspects, and lastly their isolation and detection techniques.

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III. Intended learning outcomes (ILOs) of the course:			
(A) Knowledge and Understanding:			
Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Knowledge and Understanding.**			

Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding		**Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding**	
After completing this program, students will be able to:		After completing this course, students will be able to:	
A2-	Clarifies basic concepts, principles, and theories related to animal production, animal health and nutrition, behavior management, breeding and care that is related to animal ethical codes.	a1-	Identify the types and sources of toxicants polluting the animal, avian and aquatic environments and the diseases caused by them and to understand the methods of animal identification, possible causes of death
A3-	Identifies various causes of animal diseases, animal epidemics and how they can be diagnosed; including common and life-threatening diseases of animals, poultry and fish.	a2-	Have knowledge and an understanding of how to interpret from clinical signs, laboratory diagnosis, and history, the final diagnosis of forensic and toxicological problems and adapt the proper treatment for such cases.

Teaching And Assessment Methods For Achieving Learning Outcomes:		
Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:		

Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding		**Teaching strategies/methods to be used**	**Methods of assessment**
completing this course, students will be able to:		• Lectures • Dialogue and discussion • Practical application (Labs)	The written test (Monthly, Midterm, Final) Short tests (Quizzes)
a1-	Identify the types and sources of toxicants polluting the animal, avian and aquatic environments and the diseases caused by them and to understand the methods of animal		

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	identification, possible causes of death	• Scientific trips • Field and clinical training • Simulation and demos • Brainstorming • Self education	Oral tests Practical tests (Lab Test) Evaluation of reports Assignments (Homeworks) Projects Presentations
a2-	Have knowledge and an understanding of how to interpret from clinical signs, laboratory diagnosis, and history, the final diagnosis of forensic and toxicological problems and adapt the proper treatment for such cases.		

(B) Intellectual Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
B1-	Competently practices analytical and critical thinking skills in studying and assessing health problems and reading the results of animal medical examinations that is related to sciences.	b1-	Identify risk factors, advantages and disadvantages of different epidemiological examinations. and to analyze the clinical evidence relevant to toxicological diseases.
B2-	Predicts an appropriate medical diagnosis for the most common disease states through analysis of clinical story data and the results of medical examinations of a sick animal.	b2-	Choose appropriate quantitative and qualitative methodologies requested for laboratory diagnosis.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills.	Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:	- Dialogue and discussion - Lectures	▪ The written test ▪ Oral tests

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b1-	Identify risk factors, advantages and disadvantages of different epidemiological examinations. and to analyze the clinical evidence relevant to toxicological diseases.	- Practical application (Labs) - Problem Solving - Cooperative learning and working groups - Scientific trips - Field and clinical training - Simulation and demos - Research costs and projects	▪ Practical tests ▪ Note the performance ▪ Achievement file (Accomplishments) ▪ Evaluation of reports ▪ Evaluating student presentations
b2-	Choose appropriate quantitative and qualitative methodologies requested for laboratory diagnosis.		

(C) Professional and Practical Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills

Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
C1-	Accurately records a comprehensive pathological story of a sick animal including information on healthy behavior and the necessary checks	c1-	Collect, preserve and transport of AM and PM samples, performing standard practical laboratory techniques, interpreting laboratory results
C3-	Reads the results of laboratory investigations and diagnostic scans and writes reports and prescriptions for all common cases in a proper way.	c2-	Interpret forensic and toxicological data and solving forensic-based problems

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:	▪ Practical	▪ Practical tests

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c1-	Collect, preserve and transport of AM and PM samples, performing standard practical laboratory techniques, interpreting laboratory results	application (Labs) • Problem Solving • Cooperative learning and working groups • Scientific trips • Case Study • Field and clinical training • Simulation and practical presentations • Research costs and projects	▪ Note the performance ▪ The written test ▪ Oral tests ▪ Achievement file ▪ Evaluation of reports ▪ Evaluating student presentations
c2-	Interpret forensic and toxicological data and solving forensic-based problems		

(D) General / Transferable Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **General and Transferable skills**	
Program Intended Learning Outcomes (PILOs) in General / Transferable skills	**Course Intended Learning Outcomes (CILOs) in General / Transferable skills**
After completing this program, students will be able to:	After completing this course, students will be able to:
D1- Communicates effectively with other fellow professions and animal owners and expresses his ideas clearly and objectively.	**d1-** Work effectively as a member of a teamwork in the delivery of services to community
D2- Develops his scientific, professional, research capabilities on his own, and follows what is emerging in his field of specialization, including computer applications and information and communication technology.	**d2** Use new technology and have access to internet veterinary web sites and retrieve information

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Teaching And Assessment Methods For Achieving Learning Outcomes:		
Alignment of Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:		
Course Intended Learning Outcomes (CILOs) in General and Transferable Skills	**Teaching strategies/methods to be used**	**Methods of assessment**
After completing this course, students will be able to:	• Dialogue and discussion • Cooperative learning and working groups • Scientific trips • Research costs and projects • Self-education • Demo and practical presentations • Problem Solving	▪ Achievement file ▪ Evaluation of reports ▪ Evaluating student presentations. ▪ Note the performance. ▪ Practical tests. (Lab Test)
d1- Work effectively as a member of a teamwork in the delivery of services to community		
d2- Use new technology and have access to internet veterinary web sites and retrieve information		

IV. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect					
Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	-Reading Syllabus & Knowing each other -Etiquette and ethics of the profession of Veterinary Medicine	a1, d1, d2		1	2
2	Signs & Changes of Death	a1, a2, b1,b2, c1, c2	Differences between hypostasis and contusions	1	2
3	Causes of Death	a1, a2, b1,b2, c1, c2	-Identification of used instruments in firearm wound	2	4

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			-How to differentiate Automortem and Postmortem -Death due to different causes		
4	Wounds, Burns, & Head Injuries, Choke	a1, a2, b1,b2, c1, c2	-Classification of Wounds -Frostbite -Types of chokes	1	2
6	Asphyxial Death & Drowning	a1, a2, b1,b2, c1, c2	-Diagnosis (external & Postmortem examination - Stages of Asphyxia	1	2
7	Blood & Semen Stain Examinations Pregnancy, Abortion and Sexual Offences	a1, a2, b1,b2, c1, c2	Bestiality	1	2
8	Forensic Toxicology Medico-legal Report	a1, a2, b1,b2, c1, c2	-Medico-legal important of teeth examination	1	2
9	Concepts of General Toxicology	a1, a2, b1,b2, c1, c2		1	2
10	-Toxic Gases and Corrosives -Biotoxins (Mycotoxins, Zoo toxins, Bacterial Toxins) -Metallic Toxicity	a1, a2, b1,b2, c1, c2	-Chronic Toxicity of Lead -Clinical Picture -Mercury Toxicity -Arsenic Toxicity	2	4
11	Pesticides, Insecticides, Rodenticides, Fungicides, Herpicides	a1, a2, b1,b2, c1, c2		1	2
12	-Food Poisoning -Plant Poisoning -Animal Poisoning	a1, a2, b1,b2, c1, c2	-Poisonous Plants -Salmonellosis, Clostridium -Snake Venom, Scorpion sting, Toads	1	2
13	-Irritant Toxicants -Drugs & Feed Toxicants	a1, a2, b1,b2, c1, c2	Classification of poisons	1	2
Number of Weeks /and Units Per Semester				**14**	**29**

b- Training Aspect:

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Order	Training Tasks	CILOs (symbols)	Number of weeks	Contact hours
1	Reading Syllabus & Laboratory Tour	a1, a2, b1,b2, c1, c2	1	2
2	Safety Tests in Toxicology	a1, a2, b1,b2, c1, c2	1	2
3	Hair Examination (Human, Animal, Rat)	a1, a2, b1,b2, c1, c2	1	2
4	Preparation of hair sampling of different animals	a1, a2, b1,b2, c1, c2	1	2
5	Firearm Wound	a1, a2, b1,b2, c1, c2	1	2
6	Identification of Blood Stains (Chemical Examination) (Preliminary, Gniacum Test, Kastle Mayer Test, Lauco-Malachite Green Test)	a1, a2, b1,b2, c1, c2	2	4
7	Identification of Blood Stains…. Cont. (Confirmatory Test) Lachman Test, Takayama Test (hemochromogen), Spectro scopical examination, serological test, Blood fill test	a1, a2, b1,b2, c1, c2	1	2
8	Detection of Metallic Toxicity	a1, a2, b1,b2, c1, c2	1	2
9	Quantitative detection of Aflatoxin	a1, a2, b1,b2, c1, c2	1	2
10	Identification of Plant Poisons (Fruits, seeds, roots)	a1, b1, b2, c2	1	2
11	Detection of Pesticide Poisons	b1, b2, c1, c2	1	2
12	Detection of Metallic Toxins Using of Stomach Tube (Stomach tube of large animal, rat, & mice)	a1, a2, b1,b2, c1, c2	2	4
Number of Weeks /and Units Per Semester			**14**	**28**

V. Teaching strategies of the course:

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- Lectures

- Group discussions

- Literature Review

- Brainstorming

- Practical Seminars
- Individual assignments

3-Assessment Methods:

- The written test

- Short tests (Quizzes)

- Oral tests

- Evaluation of reports

- Assignments (Homeworks)

- Projects

- Presentations

Grading Scale:

Grades are awarded on a scale from A to F, where A is the best grade (91-100) and F is a fail (<65).
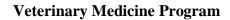
VI. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Participation and quizzes and Assignments	2-14	10	10%	a-d
2	Mid-semester exam	8	10	10%	a-d

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3	Mid-Term Practical Exam	8	10	10%	a-d
4	Final Practical Exam	16	10	10%	a-d
5	Final Oral Exam	16	5	5%	a-d
6	Final Written Exam	16	55	55%	a-d
	Total		**100**	**100%**	

VII. Students' Support:

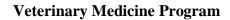| Office Hours/week	Other Procedures (if any)
Saturday-Wednesday from 8:00 a.m.-2 p.m.	Student can contact me via email

VIII. Learning Resource (MLA style or APA style)S:

1- Required Textbook(s) (maximum two)

1. Text book of Forensic Medicine and Toxicology by V.V. Pillay, 15th Edition, Paras Medical Publishing, Hyderabad.

2. Fundamentals of Forensic Medicine and Toxicology by R. Basu, PublishersBooks and Allied (P) Ltd, Kolkata.

3. Guharaj Forensic Medicine, 2nd Edition by P.V. Guharaj, Edited by M.R. Chandran, Orient Longman, Hyderabad.

2- Recommended Readings and Reference Materials

1-

3- Essential References

4- Electronic Materials and Web Sites *etc*.

PubMed https://www.ncbi.nlm.nih.gov/pubmed/

Students are free to search online for any available course materials related to the course subjects and taught lectures in the class.

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	5- Other Learning Material:
	-

X.	Course Policies:
1	**Class Attendance:** MANDATORY TO ATTEND ALL COURSE LECTURES AND LABS
2	**Tardiness:** Not allowed at all. Students must be in class or in the practical session 10 minutes prior to the beginning of lectures or practical session
3	**Exam Attendance/Punctuality:** Attendance is mandatory; absence is accepted with valid excuse. Students must be on time; tardiness is not permissible.
4	**Assignments & Projects:** All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse
5	**Cheating:** Not tolerated and may lead to **EXPELLING** the student from the program
6	**Plagiarism:** Not tolerated **AT ALL** and may lead to **EXPELLING** the student from the program
7	**Other policies:** 1. All devices must be on silent or at least on vibration during lectures/labs 2. Before any exam (written, oral) student's identity will be checked (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room. 3. Any of type/ form of cheating is not allowed no matter what. 4. Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.

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REPUBLIC OF YEMEN
SANA'A UNIVERSITY
Faculty Of Veterinary Medicine
Veterinary Medicine Program

Course Plan of Toxicology and Forensic Medicine

X. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Hussein Abdulhadi Al-Wadei	**Office Hours**					
Location & Telephone No.	Faculty of Veterinary Medicine Building	SAT	SUN	MON	TUE	WED	THU
E-mail	haalwadei@gmail.com	8am 2pm	8am 2pm	8am 2pm	8am 2pm	8am 2pm	

XI. Course Identification and General Information:						
1-	**Course Title:**	Toxicology and Forensic Medicine				
2-	**Course Number & Code:**	IM463				
3-	**Credit hours:**	**C.H**				**Total**
		Th.	**Seminar**	**Pr.**	**F. Tr.**	
		2	-	1	-	3
4-	**Study level/year at which this course is offered:**	Second Semester of Fourth Year				
5-	**Pre –requisite (if any):**	ANT232, ANT234, PH345				
6-	**Co –requisite (if any):**	None				
7-	**Program (s) in which the course is offered**	Veterinary Medicine				
8-	**Language of teaching the course:**	English				
9-	**System of Study:**	Regular / Semester				
10-	**Mode of delivery:**	Lectures and Practical				
11-	**Location of teaching the course:**	Faculty of Veterinary Medicine Building				

II. Course Description:

Forensic Medicine deals with the techniques applied in medical science for the purpose of law and Toxicology is about detecting and isolating of symptoms produced by a poison or toxin on living being (human, animal, etc.). Forensic Medicine will teach students how to define death and identify its types, determining the early and late stages of death and an in-depth study of a variety causing deaths such as

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homicide, malnutrition, diseases, starvation and accidents.

In toxicology, the students are familiarized with the general characteristics of various poisons, the toxic principle present in them, their mechanism of action, their fatal period and fatal dose, the signs and symptoms associated with each poison, the post-mortem appearances associated with them, their medico-legal aspects, and lastly their isolation and detection techniques.

II. Intended learning outcomes (ILOs) of the course:

After completing this course, students will be able to:

a1- Identify the types and sources of toxicants polluting the animal, avian and aquatic environments and the diseases caused by them and to understand the methods of animal identification, possible causes of death

a2- Have knowledge and an understanding of how to interpret from clinical signs, laboratory diagnosis, and history, the final diagnosis of forensic and toxicological problems and adapt the proper treatment for such cases.

b1- Identify and examine risk factors, advantages and disadvantages of different epidemiological examinations. and to analyze the clinical evidence relevant to toxicological diseases.

b2- Choose and apply appropriate quantitative and qualitative methodologies requested for laboratory diagnosis.

c1- Collect, preserve and transport of AM and PM samples, performing standard practical laboratory techniques, interpreting laboratory results

c2- Interpret forensic and toxicological data and solving forensic-based problems

d1- Work effectively as a member of a teamwork in the delivery of services to community

d2- Use new technology and have access to internet veterinary web sites and retrieve information

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V. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	-Reading Syllabus & Knowing each other -Etiquette and ethics of the profession of Veterinary Medicine	1	2
2	Signs & Changes of Death	2	2
3	Causes of Death	3	2
4	Wounds, Burns, & Head Injuries, Choke	4	2
5	**Exam 1** Fire-arm Injuries	5	2
6	Asphyxial Death & Drowning	6	2
7	Blood & Semen Stain Examinations Pregnancy, Abortion and Sexual Offences (bestiality)	7	2
8	**Midterm Exam**	8	2
9	Forensic Toxicology	9	2
10	Medico-legal Report	10	2
11	Concepts of General Toxicology	11	2
12	Pesticides, Insecticides, Rodenticides, Fungicides, Herpicides	12	2
13	-Food Poisoning -Plant Poisoning -Animal Poisoning	13	2
14	-Irritant Toxicants -Drugs & Feed Toxicants	14	2
15	-Toxic Gases and Corrosives -Biotoxins (Mycotoxins, Zoo toxins, Bacterial Toxins) -Metallic Toxicity	15	2
16	**Final Exam**	16	2

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Number of Weeks /and Units Per Semester	16	32

b- Training Aspect:

Order	Training Tasks	Week Due	Contact hours
1	Reading Syllabus & Laboratory Tour	1	2
2	Safety Tests in Toxicology	2	2
3	Hair Examination (Human, Animal, Rat)	3	2
4	Preparation of hair sampling of different animals	4	2
5	Firearm Wound	5	2
6	Identification of Blood Stains (Chemical Examination)	6,7	4
7	**Midterm Exam**	8	2
8	Identification of Blood Stains…. Cont. (Confirmatory Test)	9	2
9	Detection of Metallic Toxicity	10	2
10	Quantitative detection of Aflatoxin	11	2
11	Identification of Plant Poisons (fruits, seeds, roots)	12	2
12	Detection of Pesticide Poisons	13	2
13	Detection of Metallic Toxins	14	2
14	Using of Stomach Tube (Stomach tube of large animal, rat, & mice)	15	2
15	**Final Exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

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V. Teaching strategies of the course:

- Lectures

- Group discussions

- Literature Review

- Brainstorming

- Practical Seminars
- Individual assignments

VI. Assessment Methods:

- The written test

- Short tests (Quizzes)

- Oral tests

- Evaluation of reports

- Assignments (Homeworks)

- Projects

- Presentations

Grading Scale:

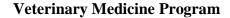Grades are awarded on a scale from A to F, where A is the best grade (91-100) and F is a fail (<65).

N.B.:

1. Any student who pass the 25% of the class attendance will not be allowed for the final exam.
2. Students are advised to study hard in the class during the semester.
3. Retaking an exam is not allowed without valid excuse.

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No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	**Participation and quizzes and Assignments**	**2-14**	**10**	10%
2	**Mid-semester exam**	8	**10**	10%
3	**Mid-Term Practical Exam**	8	**10**	10%
4	**Final Practical Exam**	16	**10**	10%
5	**Final Oral Exam**	16	**5**	5%
6	**Final Written Exam**	16	**55**	55%
	Total		**100**	**100%**

II. Learning Resources:

-

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

1. Textbook of Forensic Medicine and Toxicology by V.V. Pillay, 15th Edition, Paras Medical Publishing, Hyderabad.

2. Fundamentals of Forensic Medicine and Toxicology by R. Basu, PublishersBooks and Allied (P) Ltd, Kolkata.

3. Guharaj Forensic Medicine, 2nd Edition by P.V. Guharaj, Edited by M.R. Chandran, Orient Longman, Hyderabad

2- Essential References.

3- Electronic Materials and Web Sites *etc*.

Students are free to search online on any topic taught in class and then advise to come to discuss with class instructor to be on the same page.

II. Course Policies:

1	**Class Attendance:**

Prepared by	Quality Assurance Unit	Dean of the Faculty	Academic Development
Dr. Hussein Al-Wadei	Dr. Abdulraqeb Alshami	Ass. Prof. Dr. Abdu Alraoof Al-Shawkany	Center & Quality Assurance Ass. Prof. Dr. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas

	MANDATORY TO ATTEND ALL COURSE LECTURES
2	**Tardy:** Not allowed at all. Students must be in class 10 minutes prior to the beginning of lectures
3	**Exam Attendance/Punctuality:** Attendance is mandatory; absence is accepted with valid excuse. Students must be on time, tardiness is not permissible.
4	**Assignments & Projects:** All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse.
5	**Cheating:** Not tolerated and may lead to **EXPELLING** the student from the program
6	**Plagiarism:** Not tolerated **AT ALL** and may lead to **EXPELLING** the student from the program
7	**Other policies:** 1. All devices must be on silent or at least on vibration during lectures/labs. 2. Before any exam (written, practical, oral) student's identity will be checked (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room. 3. Any of type/ form of cheating is not allowed no matter what. 4. Maintain silence during lectures and disturbance is not allowed.

Prepared by
Dr. Hussein Al-Wadei

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