



Course Specification of Histology (1)

I. Course Identification and General Information:						
1	Course Title:	Histology (1)				
2	Course Number & Code:	ANT233				
3	Credit hours: 3	C.H				
		Theoretical	Practical	Training	Seminar	Total
		2	1	0	0	3
4	Study level/ semester at which this course is offered:	Second Year: First Semester				
5	Pre –requisite (if any):	FR112				
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	Location of teaching the course:	Faculty of Veterinary Medicine				
10	Prepared by:	Dr. Saleh Ahmed Mohammed Ali Alomaisi				
11	Date of approval:					

II. Course description:

Histology course, the students will acquire the scientific knowledge about the cell components and histological structure of different tissues and systems of domestic animals. As well, as gain the skills to differentiate different tissues with routine and special stain under light microscopes. Also has been to compare the histologic structure of organs in a variety of domestic animals. Wherever differences exist, we have tried to provide examples that are characteristic of a particular group of animals. Describe the methods of studying cells and tissues. Mention and describe the specific characteristic of cell components in relation to the functions of each component. Appreciate the reflection of the method used on the picture observed

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and become familiar (with the various methods and their applications.

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:
<p>A1- Demonstrate a sound knowledge and understanding of concepts and principles of general culture, basic science, and that support veterinary medicine.</p> <p>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.</p>	<p>a1- Define and describe the histological characteristics of normal cells.</p> <p>a2- Define the microscopic structure of the four basic body tissues (Epithelial, Connective, muscular and nervous tissues).</p>

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:		
<p>a1- Define and describe the histological characteristics of normal cells.</p> <p>a2- Define the microscopic structure of the four basic body tissues (Epithelial, Connective, muscular and nervous tissues).</p>	<p>Lectures</p> <p>Practical application (Labs)</p> <p>Dialogue and discussion</p> <p>Scientific trips</p> <p>Simulation and demos</p> <p>Brainstorming</p>	<p>The written test (Monthly, Midterm, Final)</p> <p>Short tests (Quizzes)</p> <p>Oral tests</p>

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		Self education	Practical tests (Lab Test) Projects Presentations
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(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-	Differentiate between the normal histological structures of different tissues based on histological data.
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-	Select appropriate methods to reveal specific microscopic features of cells and tissues.

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:		Lectures Practical application (Labs) Dialogue and discussion Scientific trips Simulation and demos Brainstorming	The written test Oral tests Practical tests Note the performance Achievement file (Accomplishments) Evaluation of reports
b1-	Differentiate between the normal histological structures of different tissues based on histological data.		
b2-	Select appropriate methods to reveal specific microscopic features of cells and		

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tissues.	Self education Research costs and projects	Evaluating student presentations
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(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-	Use the procedure of specimen taken its processing, cutting and stained sections for light microscopic examination.
C2-	Practices practical, diagnostic, clinical and research skills, including the collection of samples in various fields of veterinary medicine and related sciences, in a safe and effective manner, taking into account the ethics of the profession.	c2-	Perform the histological microscopic examination of various tissues of animals, birds.

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:		<ul style="list-style-type: none"> Practical application (Labs) Problem Solving Cooperative learning and working groups 	<ul style="list-style-type: none"> Practical tests Note the performance The written test Oral tests Achievement file
c1-	Use the procedure of specimen taken its processing, cutting and stained sections for light microscopic examination.		
c2-	Perform the histological microscopic examination of various tissues of animals, birds.		

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		<ul style="list-style-type: none"> • Scientific trips • Case Study • Field and clinical training • Simulation and practical presentations • Research costs and projects 	<ul style="list-style-type: none"> ▪ Evaluation of reports ▪ Evaluating student presentations
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(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-	Communicates effectively with other fellow professions and animal owners and expresses his ideas clearly and objectively.
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	Impress teamwork to get a specific task in histology

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:	<ul style="list-style-type: none"> • Dialogue and 	<ul style="list-style-type: none"> ▪ Achievement

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d1-	Communicates effectively with other fellow professions and animal owners and expresses his ideas clearly and objectively.	discussion	file
d2-	Impress teamwork to get a specific task in histology	<ul style="list-style-type: none"> • Cooperative learning and working groups • Scientific trips • Research costs and projects • Self education • Demo and practical presentations • Problem Solving 	<ul style="list-style-type: none"> ▪ Evaluation of reports ▪ Evaluating student presentations. ▪ Note the performance. ▪ Practical tests. (Lab Test)

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	Cytology and histochemistry	a1- a2- b1- b2-c1- c2- d1- d2		1	2
2	Epithelial tissues	a1- a2- b1- b2-c1- c2- d1- d2		2	4
3	Connective tissue	a1- a2- b1- b2-c1- c2- d1- d2		2	4
4	Lymphatic tissue & immunity	a1- a2- b1- b2-c1- c2- d1- d2		1	2
5	Muscular tissue	a1- a2- b1- b2-c1- c2- d1- d2		1	2
6	Blood and bone marrow	a1- a2- b1- b2-c1- c2- d1- d2		2	4

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7	Nervous tissues	a1- a2- b1- b2-c1- c2- d1- d2		2	4
8	Cardio vascular system	a1- a2- b1- b2-c1- c2- d1- d2		1	2
9	Cartilage and Bone	a1- a2- b1- b2-c1- c2- d1- d2		2	4
Number of Weeks /and Units Per Semester				14	28

b- Training Aspect:				
Order	Training Tasks	CILOs (symbols)	Number of weeks	Contact hours
1	Histological Techniques	a1- a2- b1- b2-c1- c2- d1- d2	1	2
2	Cytology	a1- a2- b1- b2-c1- c2- d1- d2	1	2
3	Epithelial tissue	a1- a2- b1- b2-c1- c2- d1- d2	2	4
4	Connective tissue	a1- a2- b1- b2-c1- c2- d1- d2	1	2
5	Cartilage and Bone	a1- a2- b1- b2-c1- c2- d1- d2	1	2
6	Lymphatic tissue& immunity	a1- a2- b1- b2-c1- c2- d1- d2	1	2
7	Muscular tissue	a1- a2- b1- b2-c1- c2- d1- d2	1	2
8	Blood and bone marrow	a1- a2- b1- b2-c1- c2- d1- d2	1	2
9	Nervous tissues	a1- a2- b1- b2-c1- c2- d1- d2	2	2
10	Cardio vascular system	a1- a2- b1- b2-c1- c2- d1- d2	2	4
11	Review	a1- a2- b1- b2-c1- c2- d1- d2	1	2
Number of Weeks /and Units Per Semester			14	28

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V. Teaching strategies of the course:

- In class lectures using PowerPoint presentation
- In class/lab quiz
- Written exams will take place during the semester
- Practical session on histopathological slides and or tissue
- Student will be encouraged to work together in groups
- Oral Exam

3-Assessment Methods:

- 1.Quizzes should take place for lectures/labs at least once a week with a total of 20 quizzes through the semester (100 points)
- 2.Three written exams through the semester (100 points each)
3. Practical exam on histopathological slides or tissue specimens (100 points)

Grading Scale:

Grades are awarded on a scale from A to F, where A is the best grade(90-100) 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 quizzes and assignments	1-12	10	10%	a1- a2- b1- b2-c1- c2-d1- d2
2	Mid-semester exam	7	10	10%	a1- a2- b1- b2-c1- c2-d1- d2
3	Practice exam	13	20	20%	a1- a2- b1- b2-c1- c2-d1- d2
5	Oral exam	13	5	5%	a1- a2- b1- b2-c1- c2-

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					d1- d2
	Final Exam	16	55	55%	a1- a2- b1- b2-c1- c2- d1- d2
	Total		100	100%	

VII. Students' Support:-	
Office Hours/week	Other Procedures (if any)
Saturday-Wednesday from 8:00 a.m.-9:00 a.m.	Student can contact me via email

VIII. Learning Resource (MLA style or APA style)S:	
1- Required Textbook(s) (maximum two)	
	<p>Course Notes</p> <p>Lecture notes (printed): Basic Veterinary Histology</p> <p>Notes on histology and Colored Atlas of Histology by staff members of histology Department</p>
2- Recommended Readings and Reference Materials	
	<p>Bloom, W. and D. W. Fawcett (1994): Textbook of Histology; 12th Ed. W. B. Saunders C., Philadelphia.</p> <p>Cheville, N.F. and Stasko, J. (2014): Techniques in Electron Microscopy of Animal Tissue. Veterinary Pathology, 51(1):28-41.</p> <p>Cormack,H.D.(1987): A text book of Histology,9th edition, Lippincott,J.B. Company.</p> <p>Drury, R.A.B. and Wallington, E.A. (1980): Carleton's histological technique. Fifth Ed. Oxford University. USA.</p> <p>Eurell, J.A. and Frappier, B.L. (2006): Dellmann's textbook of veterinary histology. Sixth edition. Black USA. Pp (156-158)(337-338).</p>

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	<p>Fawcett(1994):A Text Book of Histology,12th ed.Chapman and Hall,New York,London. Pears,A.G.E.(1985): Histochemistry theoretical and applied,4th ed.Churchill Livingstone,Melbourne and New York.</p> <p>Junqueira, Carneino and Kelly (1995): Basic Histology, 7th ed.Librairie du liban and lang buruit,London,New York.</p> <p>Nomina Histologica Veterinaria (2017): International committee on veterinary Histological Nomenclature (ICVHN). General assemble of the world association of veterinary anatomists, 2018 by the General Assembly of the WAVA. 1stEd., Hannover (Germany), Columbia, MO (U.S.A.), Ghent (Belgium), Sapporo (Japan).</p> <p>Suvarna, S.K., Layton, c. and Bancroft, J.D. (2019): Bancroft's theory and practical of histological techniques. Eighth ed. Elsevier. China, ISBN: 978-0-7020-6864-5.</p>
<p>3- Essential References</p>	
	<p>Bloom, W .and Fawcett, W. (1997): Concise Histology, Chapman and Hall, New York and London. Cormack, D.H. (1997): Essential Histology, Lippincoff-Raven, Philadelphia and New York. Dellmann, H.D. and Brown, E.M. (1998): Textbook of Veterinary Histology, 5th Edition, Williams and Wilkins, Philadelphia and London. Junqueira Histology Textstack, Eighth Edition, by Junqueira, Carneiro and Kelley. Leslie, P.G., James, L.H. and Judy, M.S. (1993): Cell Biology and Histology, 2nd Edition, Williams and Wilkins, Philadelphia and London.</p>
<p>4- Electronic Materials and Web Sites etc.</p>	
	<p>Periodicals and Web Sites of histology, http://www.med-edonline.org/ http://www.histology.to/links.html www.pubmed.com Science direct</p> <p>Students are free to search online for any available course materials related to the course subjects and taught lectures in the class.</p>
<p>5- Other Learning Material:</p>	
	<p>-</p>

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X. Course Policies:	
1	<p>Class Attendance: MANDATORY TO ATTEND ALL COURSE LECTURES AND LABS</p>
2	<p>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.</p>
3	<p>Exam Attendance/Punctuality: Attendance is mandatory; absence is accepted with valid excuse.</p>
4	<p>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.</p>
5	<p>Cheating: Not tolerated and may lead to EXPELLING the student from the program</p>
6	<p>Plagiarism: Not tolerated AT ALL and may lead to EXPELLING the student from the program</p>
7	<p>Other policies:</p> <ol style="list-style-type: none"> 1. All devices must be on silent or at least on vibration during lectures/labs. 2. Before any exam (written, practical, oral) we must check student's identity (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/exams and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.

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Course Plan of Histology (1)

I. - Information about Faculty Member Responsible for the Course:						
Name of Faculty Member	Dr. Saleh Ahmed Mohammed Ali Alomaisi	Office Hours				
Location & Telephone No.	Sana'a , Thamar Governorate 776017635	SAT	SUN	MON	TUE	WED
E-mail	alomisy78@gmail.com alomisy78@yahoo.com	8am 2pm	8am 2pm	8am 2pm	8am 2pm	8am 2pm

I. Course Identification and General Information:						
1	Course Title:	Histology (1)				
2	Course Number & Code:	ANT233				
3	Credit hours: 3	C.H				Total
		Theoretical	Practical	Training	Seminar	
		2	1	0	0	3
4	Study level/ semester at which this course is offered:	Second Year: First Semester				
5	Pre –requisite (if any):	FR112				
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 / Semesters				
10	Mode of delivery:	Lectures and Practical				
11	Location of teaching the course:	Faculty of Veterinary Medicine				

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X. Course Description:

Histology course, the students will acquire the scientific knowledge about the cell components and histological structure of different tissues and systems of domestic animals. As well, as gain the skills to differentiate different tissues with routine and special stain under light microscopes. Also has been to compare the histologic structure of organs in a variety of domestic animals. Wherever differences exist, we have tried to provide examples that are characteristic of a particular group of animals. Describe the methods of studying cells and tissues. Mention and describe the specific characteristic of cell components in relation to the functions of each component. Appreciate the reflection of the method used on the picture observed and become familiar (with the various methods and their applications).

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

After completing this course, students will be able to:

a1. Define and describe the histological characteristics of normal cells..

a2. Define the microscopic structure of the four basic body tissues (Epithelial, Connective, muscular and nervous tissues).

b1. Differentiate between the normal histological structures of different tissues based on histological data.

Differentiate between the normal histological structures of different tissues based on histological data.

b2. Select appropriate methods to reveal specific microscopic features of cells and tissues.

c1- Use the procedure of specimen taken its processing, cutting and stained sections for light microscopic examination.

c2- Perform the histological microscopic examination of various tissues of animals, birds.

d1. Communicates effectively with other fellow professions and animal owners and expresses his ideas clearly and objectively.

d2. Impress teamwork to get a specific task in histology

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X. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Cytology and histochemistry	1-2	4
2	Epithelial tissues	3-4	4
3	Connective tissue	5	2
4	Lymphatic tissue & immunity	6	2
5	Muscular tissue	7	2
6	Mid-Term Exam	8	2
7	Blood and bone marrow	9-10	4
8	Nervous tissues	11-12	4
9	Cardio vascular system	13-4	4
10	Cartilage and Bone	15	2
11	Final Exam	16	2
Number of Weeks /and Units Per Semester		16	32

b- Training Aspect:

Order	Training Tasks	Week Due	Contact hours
1	Histological Techniques	1	2
2	Cytology	2	2
3	Epithelial tissue	3-4	4
4	Connective tissue	5-6	4

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5	Cartilage and Bone	7	2
6	Mid-Term Exam	8	2
7	Lymphatic tissue& immunity	9	2
8	Muscular tissue	10	2
9	Blood and bone marrow	11-12	4
10	Nervous tissues	13	2
11	Cardio vascular system	14	2
12	Review	15	2
13	Final Exam	16	2
Number of Weeks /and Units Per Semester		16	32

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XI. Teaching strategies of the course:

- Lectures using board, data shows and multimedia aids.
- Self-learning by preparing essay and presentations (computer and faculty library)
- Brainstorm
- Discussion
- Cooperative learning
- Practical training (Clinical demonstrations, practice of skills, and discussions).
 - (a) Field visits (farms and villages)
 - (b) General experimental animal teaching
 - (c) Clinical and small group sessions
 - (d) Outpatient clinic
- Tutorial classes (small group teaching)

II. Assessment Methods:

- Written exam
- Practical exam
- Oral exam
- Quizzes
- Report assignments
- Discussion.

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation, quizzes and	2-14	10	10%

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	assignments			
2	Mid-Term Exam	8	10	10%
3	Mid-Term Practical Exam	8	10	10%
4	Final Practical Exam	13	10	10%
5	Oral Exam	13	5	5%
6	Final Exam	16	55	55%
	Total		100	100%

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

1- Required Textbook(s) (maximum two)

Course Notes

Lecture notes (printed): Basic Veterinary Histology

Notes on histology and Colored Atlas of Histology by staff members of histology Department

2- Recommended Readings and Reference Materials

Bloom, W. and D. W. Fawcett (1994): Textbook of Histology; 12th Ed. W. B. Saunders C., Philadelphia.

Cheville, N.F. and Stasko, J. (2014): Techniques in Electron Microscopy of Animal Tissue. Veterinary Pathology, 51(1):28-41.

Cormack,H.D.(1987): A text book of Histology,9th edition, Lippincott,J.B. Company.

Drury, R.A.B. and Wallington, E.A. (1980): Carleton's histological technique. Fifth Ed. Oxford University. USA.

Eurell, J.A. and Frappier, B.L. (2006): Dellmann's textbook of veterinary histology. Sixth edition. Blacky USA. Pp (156-158)(337-338).

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Pears,A.G.E.(1985): Histochemistry theoretical and applied,4th ed.Churchill

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	<p><u>Livingstone, Melbourne and New York.</u></p> <p><u>Junqueira, Carneino and Kelly (1995): Basic Histology, 7th ed. Librairie du liban and lang buruit, London, New York.</u></p> <p><u>Nomina Histologica Veterinaria (2017): International committee on veterinary Histological Nomenclature (ICVHN). General assemble of the world association of veterinary anatomists, 2018 by the General Assembly of the WAVA. 1stEd., Hannover (Germany), Columbia, MO (U.S.A.), Ghent (Belgium), Sapporo (Japan).</u></p> <p><u>Suvarna, S.K., Layton, c. and Bancroft, J.D. (2019): Bancroft's theory and practical of histological techniques. Eighth ed. Elsevier. China, ISBN: 978-0-7020-6864-5.</u></p>
<p>3- Essential References</p>	
	<p><u>Bloom, W .and Fawcett, W. (1997): Concise Histology, Chapman and Hall, New York and London.</u></p> <p><u>Cormack, D.H. (1997): Essential Histology, Lippincott-Raven, Philadelphia and New York.</u></p> <p><u>Dellmann, H.D. and Brown, E.M. (1998): Textbook of Veterinary Histology, 5th Edition, Williams and Wilkins, Philadelphia and London.</u></p> <p><u>Junqueira Histology Textstack, Eighth Edition, by Junqueira, Carneiro and Kelley.</u></p> <p><u>Leslie, P.G., James, L.H. and Judy, M.S. (1993): Cell Biology and Histology, 2nd Edition, Williams and Wilkins, Philadelphia and London.</u></p>
<p>4- Electronic Materials and Web Sites etc.</p>	
	<p><u>Periodicals and Web Sites of histology,</u> <u>http://www.med-edonline.org/</u> <u>http://www.histology.to/links.html</u> <u>www.pubmed.com</u> <u>Science direct</u></p> <p><u>Students are free to search online for any available course materials related to the course subjects and taught lectures in the class.</u></p>
<p>5- Other Learning Material:</p>	

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1. Course Policies:	
1	<p>Class Attendance:</p> <p>MANDATORY TO ATTEND ALL COURSE LECTURES AND LABS</p>
2	<p>Tardy:</p> <p>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.</p>
3	<p>Exam Attendance/Punctuality:</p> <p>Attendance is mandatory; absence is accepted with valid excuse.</p>
4	<p>Assignments & Projects:</p> <p>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.</p>
5	<p>Cheating:</p> <p>Not tolerated and may lead to EXPELLING the student from the program</p>
6	<p>Plagiarism:</p> <p>Not tolerated AT ALL and may lead to EXPELLING the student from the program</p>
7	<p>Other policies:</p> <ol style="list-style-type: none"> 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. Fr any questions students should raise their hand and wait for permission to talk.

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