

University of Agriculture, Faisalabad

Department of Veterinary Pathology

Course Outline

Program	DVM	Course Instructor	Dr. M. Tariq Javed Dr. Fazal Mahmood
Year/Semester	3 rd semester	E-mail	mtjaved_uaf@yahoo.com
Name of the Course	General Pathology		
Course No.	PATH 201		
Credit Hours	4 (3-2)		
Prerequisites	Semester first and second courses		
Follow Up	Systemic Pathology, Clinical Pathology, Poultry Pathology, Pathology Clinics.		
Category	Core Course		
Aims	General Pathology is an important course in the veterinary medical education and it help understand the disease processes which is the ultimate goal over which the treatment is based. The understanding of the course of general pathology make a sound background of students and helps to identify the disease process, its intensity and nature and thus aids in the effective treatment of the suffering animal.		
Objectives	At the completion of the course the student are expected to be able to: <ol style="list-style-type: none">1. Understand various mechanisms of disease.2. Identify and name various abnormalities/lesions.3. Differentiate various lesions both grossly and microscopically.		

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Syllabus		<p>Theory 1) Introduction to historical background. 2) Terminology 3) Cell injury and cell death; different types, mechanism and sequel. 4) Disturbances of mineral metabolism and pigmentation. 5) Disturbances of growth. 6) Disturbances of circulation. 7) Inflammation, repair and healing of wounds and fractures. 8) Neoplasia. 9) Causes of neoplasia. 10) Pathogenesis of neoplasia. 11) Classification of neoplasia. 12) Immunopathology.</p> <p>Practical 1) Demonstration of General, Gross and Microscopic picture of different pathological conditions. 2) Various Staining, histochemical and immunohistochemical techniques.</p>			
Text Books		<p>1) Kumar, V., R.S. Cotran and S.L. Robbins, 2003. Robbins Basic Pathology, 7. th Ed., Saunders, Philadelphia, Pennsylvania, USA. 2) Jones, T.D., R.D. Hunt and N.W. King, 1997. Veterinary Pathology. 6. th Ed., Williams and Wilkins, USA. 3) Slausan, D.O. and B.J. Cooper, 2002. Mechanisms of Disease: A textbook of Comparative General Pathology. 3. rd Ed. Mosby Inc. A Harcourt Sciences Company, St Lousi MO 63146. 4) Irfan, M., 1997. A Text book of Veterinary General Pathology. 1. st . Ed., University of Agriculture, Faisalabad. 5) Macfarlane, P.S., R. Reid and R. Callander, 1999. Pathology Illustrated, 4. th Ed., Churchill Livingstone, Edinburgh, UK.</p>			
Reference Material		<p>1) Javed, M. Tariq, 2001. Basic Pathology, a text book on comparative general pathology, Edition Ist, Published by Maktaba-e-Danishwaran Publications, 8-Alfazal Market, Urdu Bazar, Lahore 2) http://www.geocities.com/mtjaved_uaf 3) http://www.brisbio.ac.uk/ 4) http://155.37.5.42/NAV/Title 5) http://www.med.uiuc.edu/PathAtlas/</p>			
Instructional Aids/ Resources		<p>1) White board and board Markers/ 2) Black board and Chalk 3) Overhead Projector. 4) Transparency sheets (useable with laser pointer) 5) Multimedia 6) Soft Boards 7) Computer and CDs Questioning and explanations</p>			
Teaching Strategies		<p>1) Lectures 2) Topic discussion 3) Discussion 4) Close circuit TV aided Discussion demonstration and discussion. 5) Questioning and explanations</p>			
Assessment Criteria	Marks in %	Sessional	Mid	Final	Total 100%
	Theory	Quizes	Paper (22.5%)	Paper (45.0%)	75 %
		Assignments (7.5%)			
	Practical			Practical paper and performance	25 %
Result	<ul style="list-style-type: none"> • Results will be displayed after one week of Mid and Final Exams. • Mid term and final term papers will be shown to the students and discussed. 				
Recommendation		Seminars or lectures from experts are desired if time permits and opportunity arises.			

Credit Hours 4 (3-2)Teaching Schedule of Course No. PATH 201Title of Course GENERAL PATHOLOGY

Lect. #	WEEK	CONTENTS TO BE COVERED	NAME OF BOOK / ARTICLE etc.	PAGE NO.
	1	ENROLMENT		
1	2	Introduction, History,	Slauson and Cooper, (2002)	2-4, 7-9
2	2	Important terms,	Kumar et al. (2003)	4,
3	2	Adaptation: Atrophy, Metaplasia	Slauson and Cooper (2002)	22-23, 30-31
1	3	Hyperplasia, Hypertrophy, Hypoplasia	Slauson and Cooper (2002)	31-33, 300-302
2	3	Cell Injury: Pathogenesis of cell injury, Hypoxic cell injury	Slauson and Cooper (2002)	49 50-55
3	3	Cell injury due to membrane damage	Slauson and Cooper (2002)	56-59
1	4	Reversible cell injury – cell swelling and hydropic change	Kumar et al., (2003)	11-12
2	4	Hyalin Mucoid degeneration	Slauson and Cooper, (2002)	65
3	4	Intracellular lipid accumulation	Slauson and Cooper, (2002)	65-66
1	5	Amyloid and amyloidosis Glycogen	Slauson and Cooper (2002) Kumar et al., (2003)	69-73 18-19
2	5	Necrosis Apoptosis	Kumar et al., (2003)	12-13 13-14
3	5	Types of necrosis: Coagulative necrosis Caseous necrosis Liquefactive necrosis Fat necrosis, Zenker's necrosis	Slauson and Cooper (2002)	44-46 48 44-46 44-46 44-46
1	6	Consequences of cell injury	Slauson and Cooper (2002)	48-49

2	6	Autolysis, Difference between autolysis and necrosis,	Kumar et al., (2003)	12-13
3	6	Gangrene, Difference between gangrene and necrosis	Slauson and Cooper (2002)	48
1	7	Exogenous and endogenous pigments	Kumar et al., (2003)	19-20
		Melanin	Slauson and Cooper (2002)	67-69
		Ceroid		
		Haemosiderin		
		Lipofuscin		
2	7	Bilirubin	Slauson and Cooper (2002)	69
		Different types of jaundice	Kumar et al., (2003)	518-519
3	7	Calcification	Slauson and Cooper (2002)	69
		Gout	Kumar et al., (2003)	682-686
1	8	MID TEST		
2	8	Circulatory Disturbances:		
		Hyperaemia, Congestion	Slauson and Cooper (2002)	78-83
3	8	Oedema	Slauson and Cooper (2002)	129-136
1	9	Haemorrhage	Slauson and Cooper (2002)	83-88
2	9	Thrombosis	Slauson and Cooper (2002)	89-112
3	9	Embolism	Slauson and Cooper (2002)	113-119
1	10	Postmortem thrombi	Slauson and Cooper (2002)	111-112
2	10	Hypovolaemic Shock, Haemorrhagic Shock, Septic Shock	Slauson and Cooper (2002)	87, 193
3	10	Inflammation: Causes	Slauson and Cooper (2002)	146
1	11	Inflammatory process	Slauson and Cooper (2002)	148-154
2	11	Biochemical mediators: General features of mediators, Vasoactive amines (histamine and serotonin), Kinins, Arachidonic acid metabolites	Slauson and Cooper (2002)	206-214
3	11	Biochemical mediators: Complement system, Nitric oxide, others	Slauson and Cooper (2002)	214-218 230
			Kumar et al. (2003)	34-40

1	12	Cells of inflammation: Neutrophils, Lymphocytes	Slauson and Cooper (2002)	167-172 180-183
2	12	Macrophage, Eosinophils, Basophils, others	Slauson and Cooper (2002)	176-180 172-174 174-176 183-185
3	12	Types of inflammatory exudates	Slauson and Cooper (2002)	154-159
1	13	Severity	Slauson and Cooper (2002)	149-150
2	13	Manifestation of acute inflammation.	Slauson and Cooper (2002)	160-166
3	13	Chronic Inflammation	Kumar et al., (2003)	41-43
1	14	Healing by parenchymal regeneration.	Slauson and Cooper (2002)	226-230
2	14	Healing by connective tissue replacement, Role of growth factors.	Slauson and Cooper (2002)	230-237
3	14	Fever, Release of lysosomal enzymes and tissue injury	Kumar et al. (2003) Slauson and Cooper (2002)	41, 202-206
1	15	Neoplasia Epidemiological considerations	Slauson and Cooper (2002)	306
2	15	Nomenclature and classification	Slauson and Cooper (2002)	306-315
3	15	Morphological Characteristics	Slauson and Cooper (2002)	315-316
1	16	Grading and staging	Slauson and Cooper (2002)	316-317
2	16	Pathogenesis	Slauson and Cooper (2002)	317-331
3	16	causes	Slauson and Cooper (2002)	366-376
1	17	Genetic aspect of oncogenesis	Slauson and Cooper (2002)	331-341
2	17	Mechanism of metastasis	Slauson and Cooper (2002)	341-356
3	17	Tumour immunology	Slauson and Cooper (2002)	359-366

Reference/Text Books:

- 1) Slauson, D.O. and B.J. Cooper, (2002). Mechanisms of Disease: A textbook of Comparative General Pathology. 3rd Ed. Mosby Inc. A Harcourt Sciences Company, St Louis MO 63146.

- 2) Kumar, V., R.S. Cotran and S.L. Robbins, (2003). Robbins Basic Pathology, 7th Ed., Saunders, Philadelphia, Pennsylvania, USA.
- 3) Jones, T.D., R.D. Hunt and N.W. King, 1997. Veterinary Pathology. 6th Ed., Williams and Wilkins, USA.
- 4) Irfan, M., 1997. A Text book of Veterinary General Pathology. 1st Ed., University of Agriculture, Faisalabad.
- 5) Macfarlane, P.S., R. Reid and R. Callander, 1999. Pathology Illustrated, 4th Ed., Churchill Livingstone, Edinburgh, UK.

Suggested for further Reading

- 1) Javed, M. Tariq, 2001. **Basic Pathology**, a text book on comparative general pathology, Edition Ist, Published by Maktaba-e-Danishwaran Publications, 8-Alfazal Market, Urdu Bazar, Lahore.
- 2) http://www.geocities.com/mtjaved_uaf
- 3) <http://www.brisbio.ac.uk/>
- 4) <http://155.37.5.42/NAV/Title.HTM>
- 5) <http://www.med.uiuc.edu/PathAtlasf/titlePage.html>
- 6) <http://www.uniud.it/dmmm/anpat/pathgallery/>
- 7) <http://www.pathguy.com/~lulo/gallery.htm>
- 8) <http://alf3.urz.unibas.ch/pathopic/e/intro.htm>
- 9) <http://erl.pathology.iupui.edu/c603/>
- 10) <http://www.path.uiowa.edu/virtualslidebox/>
- 11) http://www.palms.med.usyd.edu.au/pathology_museum/

Assignment No. 1	History of Medicine / Pathology
Assignment No. 2	Ultrastructural changes in cell Injury
Assignment No. 3	Tabulate diseases in relation to inflammatory exudate
Assignment No. 4	Recent developments in the field of neoplasia
Assignment No. 5	Role of cytokines in inflammation.
Assignment No. 6	Micorobicidal mechanism by Macrophages/Neutrophils

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**PRACTICAL SCHEDULE FOR GENERAL PATHOLOGY
PATH-201**

Week 1	ENROLMENT
Week 2	Introduction to Pathology Lab.
Week 3	Preservation and fixation of morbid tissues,
Week 4	General rules for identification of gross changes in various organs/tissues
Week 5	Preparation of microscopic slides (Tissue processing, embedding and staining)
Week 6	Demonstration of microscopic slides, degenerative changes
Week 7	Demonstration of microscopic slides, degenerative changes
Week 8	Demonstration of microscopic slides of various infiltrations
Week 9	Demonstration of microscopic slides of various infiltrations
Week 10	Demonstration of microscopic slides of different types of necrosis
Week 11	Demonstration of microscopic slides of different types of necrosis
Week 12	Demonstration of microscopic slides with vascular disturbances
Week 13	Demonstration of microscopic slides with vascular disturbances
Week 14	Demonstration of microscopic slides with changes in growth
Week 15	Demonstration of microscopic slides showing inflammatory changes in various organs
Week 15	Demonstration of microscopic slides showing inflammatory changes in various organs
Week 16	Demonstration of important neoplasms of animals
Week 17	PRACTICAL EXAMINATION