Beni-Suef University
Faculty of Veterinary Medicine

Course specification (2017-2018)

1-Basic information

Course Code:	S2-ANAT
Course title :	Anatomy and Embryology
Academic year:	Second Academic Year
Program title:	B. Sc. Veterinary Medical sciences
Contact hours/ week	6 hours/week, (Lecture 3hrs/week, Practical 3hrs/week)
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

After completing the undergraduate course in Veterinary Anatomy, the student will be able to progress to the preclinical and clinical years with a thorough understanding of the fundamentals of veterinary anatomy, beginning with the development, and the gross anatomy of the digestive, urinary, genital, nervous, and lymphatic systems of the domestic animals.

3- Intended learning outcomes of course (ILOs)

a-Knowledge and understanding:

By the end of this course the student should be able to:

a1. Recall the correct anatomical terms when giving topographical description of directional or positional anatomical detail.

a2. Elicit the nomenclature for the planes used in anatomical presentation of specimens.

a3. Recognize a comprehensive knowledge about the gross anatomy of the digestive, urogenital, nervous and lymphatic system of domestic animals.

a4. Enumerate the skeletal and muscular components of the equine head, neck, abdomen and pelvis.

a5. Conclude the typical structures of the central nervous system, peripheral nervous system and autonomic nervous system.

a6. Define the basic anatomy of the equines central nervous system, (brain and spinal cord) and peripheral nervous system.

a7. Mention the topographical position, afferent and efferent lymph drainage in ox.

a8. Set the comparative points of the various visceral organs in domestic animals with special reference to their clinical significances.

a9. Enumerate the components of the equine skull, mandible, and cervical, lumbar, sacral and caudal vertebrae.

a10. Ascertain the surface landmarks of the underling bones, muscles, tendons and internal structures (main nerves, vessels and viscera).

a11. Set the correlation of the anatomical facts to the clinical problems.

a12. Mention the developmental stages of digestive, urogenital and nervous systems.

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b-Intellectual skills:

By the end of this course the student should be able to:

b1. Distinguish the site of origin of the different peripheral nerves.
b2. Compare between the different organs of the urinary, genital and digestive systems of different animals.
b3. Analyze the diversity of knowledge in the term of gross anatomical characteristics of each organ and/or structure.
b4. Identify the different surface markings of the equine head, abdomen and pelvis.
b5. Identify isolated bones of the equines head, abdomen and pelvis.
b6. Assess the lymph nodes and normal lymph pass-ways in bovine body.
b7. Differentiate the bones of animals head, neck, abdomen and pelvis.
b8. Recognize the origin and insertion of different skeletal muscles of equines head, neck, abdomen and pelvis.
b9. Describe the muscles and major named vessels and nerves of the equine head, neck, abdomen and pelvis in terms of functional groups.
b10. Recognize the process of the development of digestive, urinary, genital and nervous systems and its relation to the congenital malformations.
b11. Determine the normal anatomical structures and topography of the different visceral organs (digestive, urinary and genital systems) in domestic animals.
b12. Distinguish with evidence and confidence characteristic features of each organ and/or structure in each animal class.
b13. Compare between the visceral organs of different domestic animals.
b14. Relate structure-functions relation of those organs system components.
b15. Explain the interrelationships within and between anatomical and physiological systems of the animal's body.
b16. Estimate the problems related to the visceral organs in different animals based on the gained knowledge about their normal anatomy and position.
b17. Correlate the anatomical facts to the clinical problems.
b18. Analyze the gained anatomical facts of importance in the field of practice.

c-Professional and practical skills

By the end of this course the student should be able to:

c1. Correlate anatomical facts with their applied aspects in the veterinary field.
c2. Draw labeled diagrams and illustrations of visceral organs, structures associated with body regions, cavities, head, neck, abdomen, pelvis and sense organs.
c3. Investigate the normal anatomical structures of the equine brain and spinal cord.
c4. Interpret the clinical findings of the lymph nodes in ox.
c5. Detect the shape and position of isolated and assembled bones of different domestic animals.
c6. Coordinate the radiographic anatomy of the head, neck, abdomen and pelvis to clarify some field problems.
c7. Interpret graphs of anatomical and physiological data
c8. Differentiate between isolated viscera of different animals.

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c9. Apply the anatomy and embryology facts in solving and explanation of different clinical problems.
c10. Implement surface anatomy knowledge on the living animals and in approaching some field cases.
c11. Interpret on clinical findings inside different animal bodies based on known normal anatomy background.
c12. Dissect probably different regions of animal's body.
c13. Apply the anatomical facts of the veterinary anatomy in relation to the surgery, medicine, and physical methods of diagnosis.
c14. Use correctly the surgical instrumentation to carry out cadaver dissection.

d-General and transferable skills

By the end of studying the course, the student should be able to:

d1. Appreciate the team working and time management.
d2. Value the ethics and respect to all individuals inside and outside the dissecting room and pay appropriate respect to the animal's cadavers.
d3. Recognize the scope and limits of their role as students as well as the necessity to seek and apply collaboration with other colleagues.
d4. Maintain a professional image concerning behavior, dress and speech. d5. Be responsible toward work.
d6. Communicate effectively with public, colleagues and appropriate authorities.
d7. Achieve computer skills necessary to make use of medical databases and use the internet for communication.
d8. Prepare a scientific paper and essay.

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4-Topics and contents

Course	Topic	Pract.	Lect.	Total no. of hours
Second Year - First Semester General Anatomy (Comparative and applied) 6 hours / weak (Lec. 3hrs/wk - Pract. 3hrs/wk)	1. Development of the digestive system (primitive gut, mouth cavity, salivary glands, pharynx, pharyngeal apparatus, esophagus, stomach, intestine, pancreas, liver, gall bladder, cloaca).	-	6	6
	2. Gross anatomy of the digestive system (mouth cavity, lips, cheeks, hard palate, soft palate, tongue, salivary glands, pharynx, esophagus, stomach, duodenum, ileum, jejunum, cecum, colon, rectum, anal canal, liver, pancreas)	12	15	27
	3. Development of the urogenital system (derivatives of the hind gut, pronephros, mesonephros metanephros, urinary bladder, urethra, gonads, genital ducts, descent of testes and ovaries, external genital organs).	-	6	6
	4. Gross anatomy of the urinary system (kidneys, ureters, urinary bladder, urethra).	3	3	6
	5. Gross anatomy of the male genital system (testes, epididymis, ductus deferens, spermatic cord, scrotum, urethra, penis, prepuce, accessory genital glands).	6	6	12
	6. Gross anatomy of the female genital system (ovaries, fallopian tube, uterus, urethra, vagina, vulva).	3	3	6
	7. Lumbar, sacral and caudal vertebrae of domestic animals.	3	-	3
	8. Dissection of the equine abdomen (abdominal muscle, abdominal cavity)	6	-	6
	9. Dissection of the equine pelvis (male and female)	6	-	6
	Total	39	39	78

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Course	Topic	Pract.	Lect.	Total no. of
Second year – Second semester General Anatomy (Comparative and applied) 6 hours / weak (Lec. 3hrs/wk - Pract. 3hrs/wk)	1. Development of the nervous system (neural tube, spinal cord, neural crest)	-	3	3
	2. Gross anatomy of the equine nervous system (Classification, meninges, brain, brain ventricles, cranial nerves, spinal nerves, autonomic nerves).	3	15	18
	3. Blood supply of equine head and neck (common carotid artery; external carotid artery, internalcarotid artery, occipital artery).	3	3	6
	4. Gross anatomy of ox lymphatic system (large ly mph trunks and ducts, lymph centers of the head, ne ck, thorax, thoracic limb, abdomen, pelvis, and pelvic limb)	3	12	15
	5. Gross anatomy of the eyes (orbit, Periorbita and orbital fascia, eyelids, conjunctiva, ocular muscles, lacrimal apparatus, sclera, cornea, choroid, iris, ciliary body, retina, chambers of the eye, optic nerve)	3	3	6
	6. Gross anatomical features of equine head (skull mandible, hyoid bone, muscles, vessels, nerves, viscera), neck (cervical vertebrae, muscles, vessels, nerves, viscera).	27	-	27
	7. Applied anatomy (sites of local nerve blocks in the head region, laryngeal ventriculectomy in horse, tracheotomy in horse, guttural pouch, lymph nodes, esophagus, thorax).	-	3	3
	Total	39	39	78

5-Teaching and learning methods

5.1. Lectures (brain storming, discussion) in which one or more of the following facilities are used:

5.1.1. White board and data-show presentations.

5.1.2. Educational animal models, bones and preserved specimens.

5.1.3. Illustrations, anatomical charts, CD's, PowerPoint slides and recorded anatomy videos.

5.2. Laboratory sessions in which one or more of the following facilities are used:

5.2.1. Tutor presentation followed by students' small group sessions.

5.2.2. Freshly donkeys

5.2.3. Prepared bones from euthanatized animals.

5.2.4. Demonstrating formalin preserved cadavers.

5.3. Independent (laboratory and home assignments supervised by tutor)

5.3.1. Writing reports and assignments (computer researches and faculty library attendance).

5.3.2. Preparation of colored posters and slide presentation.
5.3.3. Preparation of bones and preserving specimens.
5.3.4. Group discussion.

6-Teaching and learning methods for the students with disabilities

6.1. Students with difficulties are encouraged to contact department instructors in office hours to discuss their individual needs for learning accommodation that may affect their ability to participate in course activities or to meet the course requirements.
6.2. At the end of practical sessions, overall revision was done for all students to overcome the problem of non-attendance any practical session.

7-Student assessment

7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Written Exam	a1-a12	b1-b18		d1
Practical Exam		b2, b4, b5, b7, b8, b9, b11, b13	c1-c11	d2,d3,d4 , d5,d8
Oral Exam	a1-a12	b1-b18	c1-c9	d6,

7.2. Assessment schedules/semester:

Method	Week(s)
Writing exam	15th week
Final exams	Managed by faculty administration
Oral Exams	Managed by department administration
Student activities	Along the semester

7.3. Weight of assessments:

Assessment	Weight of assessment
Writing exam	50%
Practical exam	30%
oral exams	20%
Student activities	----
Total	100%

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8- List of references

8.1. Notes and books:

Department notes

8.2. Essential books:

8.2.1. Sisson and Grossman's the anatomy of the domestic animals, 5th edition (Getty, R., 1975), published by W.B. Saunders Company, Philadelphia, London and Toronto. ISBN: 0-7216-4102-4- vol.1 and 0-7216-4107-5- Vol.-2.

8.2.2. Anatomy and physiology of farm animals. 6th edition (Frandson, R.D., Wilke, W.l. and Fails, A.D., 2003), published by Lippicott Williams and Wilkins, Awolters Kluwer Company, ISBN: 0-7817-3358-8.

8.2.3. Clinical dissection guide for large animals, horse and large ruminants, 2nd edition (Constantinescu, G.M. and Constantinescu, I.A., 2004), published by Iowa State Press, ISBN: 0-8138-0319-5.

8.2.4. Miller's anatomy of the dog (Evans, H.E. and Christensen, G.C., 1979), published by W.B. Saunders Company, Philadelphia, London, Toronto, Mexico city, Rio de -Janeiro, Sydney and Tokyo, ISBN:0-7216-3438-9.

8.2.5. Anatomy of the dromedary (Smuts, M.S. and Bezuidenhout, A.J., 1987), published by Clarendon press, Oxford, ISBN: 0-19-857188-7.

8.2.6. Atlas anatomy of the horse, (G.A. Swielim, 1997), published by Faculty of veterinary medicine- Cairo, ISBN: 977-19-4770-2.

8.2.7. Anatomy of the horse, an illustrated text, 2nd edition (Budras, K.D., Sack, W.O. and Röck, S., 1994), published by Mosby work. Hanover Germany, ISBN: 07234-19213.

8.2.8. Bovine anatomy, an illustrated text, 1st edition (Budras, K.D., Habel, R.E., Wiinsche, A. and Buda, S. 2003), published by Hanover, Germany, ISBN: 3-89993-000-2.

8.2.9. Text book of veterinary anatomy (Dyce, K.M.; Sack, W.O. and Wensing, C.J.G.1987), published by W.B. Saunders Co., Philadelphia, London, Toronto, Montreal, Sydney, Tokyo, ISBN: 0-7216-1332-2.

8.2.10. The Embryology of the domestic animals, developmental mechanisms and malformations (Nodern, D.M. and De-Lahunta, A.1986), published by Williams and Wilkins, Baltimore, London, Los Anglos, Sydney, ISBN: 0-683-06545-9.

*These books are available in the library of faculty of Veterinary Medicine, Beni-Suef University.

8.3. Recommended textbooks:

8.3.1. Anatomy of the horse, fifth, revised edition (Klaus-Dieter Budras W.O. Sack Sabine Röck, 2009), Schlütersche Verlagsgesellschaft mbH & Co. KG., Hans-Böckler-Alle 7, 30173 Hannover, printed in Germany, ISBN 978-3-89993-044-3.

8.3.2. Textbook of veterinary anatomy, fourth edition (K.M. Dyce, C.J.G. Wensing), Saunders elsevier, 3251 Riverport Lane, St. Louis, Missouri, 63043, ISBN: 978-1-4160-6607-1.

8.3.3. Miller's anatomy of the dog, fourth edition (H.E. Evans, A. de-Lahunta, 2011),

Saunders elsevier, 3251 Riverport Lane St. Louis, Missouri 63043, ISBN: 978-143770812-7.

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8.3.4. Essentials of domestic animal embryology, first edition, (Hyttel, P., Sinowatz, F. and Vejlested, M., 2010), Saunders Elsevier, Edinburgh, London, New York, Oxford, Philadelphia, St Louis, Sydney, Toronto, ISBN: 978-0-7020-2899-1.

*These books are available online through Google search (www.google.com).

8.4. Journals, Websites ……..etc

Journals

Anatomia, Histologia, Embryologia - Wiley Online Library
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1439-0264
The Anatomical Record - Wiley Online Library
http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1932-8494
Journal of Anatomy- Wiley Online Library
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1469-7580
Annals of Anatomy - Journal-Elsevier
http://www.journals.elsevier.com/annals-of-anatomy/
Journal of Veterinary Anatomy
http://www.vetanat.com/
Indian Journal of Veterinary Anatomy
http://epubs.icar.org.in/ejournal/index.php/IJVA
International Journal of Animal Anatomy and Physiology
http://internationalscholarsjournals.org/journal/ijaap
Journal of Advanced Research in Veterinary Science and Technology
http://www.adrpublications.com/Journal-of-Advanced-Research-in-Veterinary-Science-and-Technology.html
Beni-Suef Veterinary Medical journal
http://www.bsuv.bsu.edu.eg/vetmed.aspx#

Websites

Google search www.google.com
Sciencedirecthttp://www.sciencedirect.com.
Pubmed http://www.Pubmed.
Colorado State university online http://www.online.colostate.edu/courses/VS/VS333.dot
The university of adelaide https://www.adelaide.edu.au/course-outlines/104377/1/sem-1/
Veterinary anatomy courses http://vanat.cvm.umn.edu/vanatCourses/CVM6100.html
Anatomy museum http://skeletonmuseum.com/
Animals skeletons -www.animalskeletons.net
VET Veterinary Educational Toolshttp://www.cvmbs.colostate.edu/vetneuro/
Education platformhttp://ivsascove.wix.com/eduplatform#!anatomy-hist-embr/ctsm
Veterinary anatomy http://vetmedicine.about.com/od/anatomy/
Online Veterinary Anatomy Museum http://www.onlineveterinaryanatomy.net/
Imaging Anatomy Website http://vetmed.illinois.edu/courses/imaging_anatomy/
Real 3D anatomy http://www.real3danatomy.com/
Interactive Programs for Canine Anatomyhttp://www.tabanat.com
Virtual Canine Anatomyhttp://www.cvmbs.colostate.edu/vetneuro/VCA3/vca.html
Veterinary anatomy museum http://vanat.cvm.umn.edu/museum/

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Veterinary neurobiology laboratory preview/reviewhttp://vanat.cvm.umn.edu/neurolab/

Carnivore and developmental anatomy lectureshttp://vanat.cvm.umn.edu/TFFlect.html
Rooney's guide to the dissection of the horsehttp://www.vet.cornell.edu/oed/horsedissection/
Interactive drawings for veterinary anatomistshttp://www.images4u.com/
Veterinary anatomy: directions and planeshttp://vanat.cvm.umn.edu/anatDirections/
Canine planar anatomyhttp://vanat.cvm.umn.edu/planar/
Gaits: gait foot-fall patterns http://vanat.cvm.umn.edu/gaits/
Sheep brain dissection guidehttp://academic.uofs.edu/department/psych/sheep/
Anatomical Society of Great Britain and Ireland, http://www.anatsoc.org.uk/
Sheep brain atlashttps://www.msu.edu/~brains/brains/sheep/index.html
Neuroanatomy correlation labhttp://instruction.cvhs.okstate.edu/neurology/
Primate anatomy and physiology http://pin.primate.wisc.edu/aboutp/anat/
Functional anatomy of the horse foot
http://extension.missouri.edu/xplor/agguides/ansci/g02740.htm

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Topic		Week	Intended learning outcomes of course			
			K&U	I.S (b)	I.S	G.T.S (d)
Second Year - First Semester General Anatomy (Comparative and applied) 6 hours / weak (Lec. 3hrs/wk - Pract. 3hrs/wk)	1. Development of the digestive system (primitive gut, mouth cavity, salivary glands, pharynx, pharyngeal apparatus, esophagus, stomach, intestine, pancreas, liver, gall bladder, cloaca).	1, 2	12	10	2, 9	1-8
	2. Gross anatomy of the digestive system (mouth cavity, lips, cheeks, hard palate, soft palate, tongue, salivary glands, pharynx, esophagus, stomach, duodenum, ileum, jejunum, cecum, colon, rectum, anal canal, liver, pancreas)	3, 4, 5, 6, 7	1, 2, 8, 11	3, 11, 12, 13, 14, 15, 16	2, 5, 8	
	3. Development of the urogenital system (derivatives of the hind gut, pronephros, mesonephros metanephros, urinary bladder, urethra, gonads, genital ducts, descent of testes and ovaries, external genital organs).	8, 9	12	10	2, 9	
	4. Gross anatomy of the urinary system (kidneys, ureters, urinary bladder, urethra,)	9, 10	1, 2, 3, 11	2, 3, 11, 12, 13, 14, 15, 16	2, 5, 8	
	5. Gross anatomy of the male genital system (testes, epididymis, ductus deferens, spermatic cord, scrotum, urethra, penis, prepuce, accessory genital glands).	10, 11, 12	1, 2, 3, 8, 11	2, 3, 11, 12, 13, 14, 15, 16	2, 5, 8,12	
	6. Gross anatomy of the female genital system (ovaries, fallopian tube, uterus, urethra, vagina, vulva).	13	1, 2, 3, 8, 11	2, 3, 11, 12, 13, 14, 15, 16,17	2, 5, 8,13	
	7. Lumbar, sacral and caudal vertebrae of domestic animals.	1	1, 2, 4, 8, 9, 10, 11	3, 4, 7, 12	2, 5, 6	
	8. Dissection of equine abdomen (abdominal wall and abdominal cavity).	2, 3	1, 2, 4, 8, 10, 11	3, 4, 5, 7, 9, 12, 14,18	2, 5, 6	
	9. Dissection of equine pelvis (male and female).	8	1, 2, 4, 8, 10, 11,12	3, 5, 7, 9, 14	2, 6,14	

Topic		Week	Intended learning outcomes of course			
			K&U	I.S (b)	I.S	G.T.S (d)
Second Year - First Semester General Anatomy (Comparative and applied) 6 hours / weak (Lec. 3hrs/wk - Pract. 3hrs/wk)	7. Development of the nervous system (neural tube, spinal cord, neural crest).	1	1	10	2, 9	1-8
	2. Gross anatomy of the equine nervous system (Classification, meninges, brain, brain ventricles, cranial nerves, spinal nerves, autonomic nerves).	2, 3, 4, 5, 6	2, 3, 4, 5, 6	1, 3, 12, 15, 16	2, 3	
	3. Blood supply of equine head and neck (common carotid artery; external carotid artery, internal carotid artery, occipital artery).	7	7	3, 12, 15	2, 6	
	4. Gross anatomy of ox lymphatic system (large lymph trunks and ducts, lymph centers of the head, neck, thorax, thoracic limb, abdomen, pelvis, and pelvic limb)	8, 9, 10, 11	8, 9, 10, 11	3, 6, 12, 15	2, 4	
	5. Gross anatomy of the eyes (orbit, Periorbita and orbital fascia, eyelids, conjunctiva, ocular muscles, lacrimal apparatus, sclera, cornea, choroid, iris, ciliary body, retina, chambers of the eye, optic nerve)	13	13	3, 12, 15	2	
	6. Gross anatomical features of equine head (skull, mandibl e, hyoid bone, muscles, vessels, nerves, viscera), neck (cervical vertebrae, muscles, vessels, nerves, viscera).	1, 2, 3, 5, 6, 8, 9, 10, 12	1, 2, 3, 5, 6, 8, 9, 10, 12	3, 4, 5, 7, 9, 12, 14, 15	2, 5, 6, 8	
	7. Applied anatomy (sites of local nerve blocks in the head region, laryngeal ventriculectomy in horse, tracheotomy in horse, guttural pouch, lymph nodes, esophagus, thorax).	13	13	3, 4, 12, 17, 18	1, 4, 6, 7, 9, 10, 11,12, 13, 14	