



## Course specification (2017-2018)

### 1-Basic information

|                     |   |
|---------------------|---|
| Course Code:        | S1-ANAT   |
| Course title :      | Anatomy and Embryology                                |
| Academic year:      | First Academic Year                                   |
| Program title:      | B. Sc. Veterinary Medical sciences                    |
| Contact hours/ week | 5hours/week, (Lecture 2hrs/week, Practical 3hrs/week) |
| Approval Date       |   |

### 2-Professional information

#### Overall aims of the course:

This course aims to:

Provide the students with anatomical terminology and principle information about the general anatomy and different developmental stages of domestic animals that will enable them to gain skills for comparative anatomy of the limbs and thorax (bones, joints, muscles, main vessels and nerves) and the respiratory and cardiovascular systems of different domestic animals, beside it also provide the students with the basic information about the fowl and fish anatomy.

### 3-Intended learning outcomes of the course(ILOs)

#### a-Knowledge and understanding:

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

- a1. Recall the different technical and topographical anatomical terms.
- a2. Distinguish the principle component of the locomotor system with special references to the thoracic limb, pelvic limb and thorax.
- a3. Conclude the typical structure of the respiratory and cardiovascular system of the domestic animals.
- a4. Ascertain the surface landmarks of the underling bones, muscles, tendons and internal structures (main nerves, vessels and viscera).
- a5. Set the correlation of the anatomical facts to the clinical problems.
- a6. Mention the different prenatal stages of animal's development.
- a7. Distinguish the basic anatomical structures of avian and fish body.

#### b-Intellectual skills:

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

- b1. Analyze the diversity of knowledge in the term of gross anatomical characteristics of each organ and/or structure.
- b2. Identify the different surface markings of the animal's limbs and thorax.
- b3. Identify isolated bones of the limbs of the domestic species.
- b4. Differentiate the bones of limbs for all animal species in addition to the joints of equine limbs.



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- b5. Predict the effect on limb stance and locomotion caused by paralysis of specific nerves or muscle tendon rupture.
- b6. Differentiate between the normal and abnormal position and deviated movements and malformations of the different joint in both limbs of equines.
- b7. Recognize the origin and insertion of different skeletal muscles of equines limbs and thorax.
- b8. Describe the muscles and major named vessels and nerves of the equine limbs and thorax in terms of functional groups.
- b9. Recognize the process of the development of different body parts and its relation to the congenital malformations.
- b10. Determine the normal anatomical structures and topography of the different visceral organs (respiratory and heart) in domestic animals.
- b11. Distinguish with evidence and confidence characteristic features of each organ and/or structure in each animal class.
- b12. Compare between the lungs of different domestic animals.
- b13. Relate structure-functions relation of those organs system components.
- b14. Explain the interrelationships within and between anatomical and physiological systems of the animal's body.
- b15. Discuss the essential normal anatomical structures of fowl and fish bodies.
- b16. Estimate the problems related to the intestine and lungs in poultry 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. Detect the shape and position of isolated and assembled bones of different domestic animals.
- c2. Coordinate the radiographic anatomy of the bones and thorax to clarify some field problems.
- c3. Draw labeled diagrams and illustrations of each normal anatomical structure and developed organs and systems.
- c4. Interpret graphs of anatomical and physiological data
- c5. Differentiate between isolated bones and lungs of different animals.
- c6. Apply the anatomy and embryology facts in solving and explanation of different clinical problems.
- c7. Perform postmortem dissection of poultry.
- c8. Implement surface anatomy knowledge on the living poultry and in approaching some field cases.
- c9. Interpret on clinical findings inside poultry and fish bodies based on known normal anatomy background.
- c10. Assess the viability and usefulness of fish used for food intake depends on the normal gross anatomy.
- c11. Dissect probably different regions of animal's body.



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### 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.

### 4-Topics and contents

| Course   | Topic   | Pract.    | Lect.     | Total no. of hours |
|--|---|-----------|-----------|--------------------|
| First Year – First Semester<br>General Anatomy and Embryology<br>5 hours / week<br>(Lec. 2hrs/wk - Pract. 3hrs/wk) | 1 – General osteology (Anatomical technical terms, skeletons, types of bones, bone structure).                              | -         | 2         | 2                  |
|  | 2– General arthrology (Definition, classification of joints, movements of joints).  | -         | 4         | 4                  |
|  | 3– General embryology (Embryological terms, gametogenesis, ovulation, fertilization, cleavage, gastrulation, placentation). | -         | 10        | 10                 |
|  | 4- Fowl anatomy   | 3         | 4         | 7                  |
|  | 5- Fish anatomy   | 3         | 4         | 7                  |
|  | 6- Rabbit anatomy   | 3         | 2         | 5                  |
|  | 7– Bones of the thoracic limbs of domestic animals (scapula, humerus, radius, ulna, carpus, metacarpus, digits, and hoof).  | 18        | -         | 18                 |
|  | 8– Dissection of the thoracic limb (muscles of lateral aspect, muscles of medial aspect, blood vessels and nerves)          | 12        | -         | 12                 |
|  | <b>Total</b>  | <b>39</b> | <b>26</b> | <b>65</b>          |



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| Course   | Topic   | Pract. | Lect. | Total no. of hours |
|--|---|--------|-------|--------------------|
| First Year – Second semester<br>General Anatomy and Embryology<br>5 hours / eak<br>(Lec. 2hrs/wk - Pract. 3hrs/wk) | 1– Gross anatomy of animals' respiratory system (nostrils, nasal cavity, paranasal sinuses, nasopharynx, larynx, trachea, lung, mediastinum, pleura). | 6      | 8     | 14                 |
|  | 2 – Gross anatomy of equine cardiovascular system except head and neck (heart, coronary arteries, thoracic aorta, abdominal aorta)                    | 3      | 10    | 13                 |
|  | 3- Special arthrology (joints of equine thoracic limb, joints of the equine pelvic limb).   | -      | 10    | 10                 |
|  | 4- Bones of the pelvic limb of domestic animals (os coxae, femur, tibia and fibula).  | 9      |       | 9                  |
|  | 5- Dissection of the equine pelvic limb (muscles of the lateral aspect, muscles of the medial aspect, blood vessels, nerves)                          | 12     | -     | 12                 |
|  | 6- Dissection of equine thorax (thoracic cage, muscles, vessels and nerves of thoracic wall, thoracic cavity).  | 12     | -     | 12                 |
|  | Total   | 42     | 28    | 70                 |

#### 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. Bones and preserved specimens.
  - 5.1.3. Illustrations 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 died donkeys
  - 5.2.3. Educational models and lung air-dried specimens.
  - 5.2.4. Prepared bones from euthanatized animals.
  - 5.2.5. Demonstrating formalin preserved cadavers.
  - 5.2.6. Freshly died fowl and fish specimens.
- 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.



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### 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  | IS  | P&P.S                                   | G.S                    |
| Final Exam     | a1, a3, a4,<br>a5, a6, a7                                  | b5, b6, b9, b10,<br>b11, b12, b13,<br>b14, b15, b16,<br>b17, b18, | c1, c2, c3,<br>c4, c5, c6, c8,<br>c9,   | d1                     |
| Practical Exam |  | b1, b2, b3, b4,<br>b7, b8, b10,<br>b11, b12,                      | c1, c2, c5, c7,<br>c8, c9, c10,<br>c11, | d1, d2, d3,<br>d4, d5, |
| Oral Exam      | a1-a7  | b1-b18  | c1, c2, c4, c5,<br>c6, c8, c9, c10      | d3, d6,                |

#### 7.2. Assessment schedules/semester:

| Method             | Week(s)                              |
|--------------------|--------------------------------------|
| Writing exam       | 15 <sup>th</sup> week                |
| Practical exam     | Managed by faculty administration    |
| Oral Exams         | Managed by department administration |
| Student activities | Along the semester                   |

#### 7.3. Weight of assessments:

| Assessment       | Weight of assessment |
|------------------|----------------------|
| Practical and    | 30%                  |
| Final exams      | 50%                  |
| oral exams       | 20%                  |
| Student activity | ----                 |
| Total            | 100%                 |



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### 8-List of references

#### 8.1. Notes and books:

None

#### 8.2. Essential books:

8.2.1. Sisson and Grossman's the anatomy of the domestic animals, 5<sup>th</sup> 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. 6<sup>th</sup> edition (Frandsen, R.D., Wilke, W.I. 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, 2<sup>nd</sup> 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, 2<sup>nd</sup> 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, 1<sup>st</sup> 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](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](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](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](http://www.google.com)

Scienedirect <http://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](http://www.animalskeletons.net)

VET Veterinary Educational Tools <http://www.cvmb.colostate.edu/vetneuro/>

Education platform <http://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/](http://vetmed.illinois.edu/courses/imaging_anatomy/)

Real 3D anatomy <http://www.real3danatomy.com/>

Interactive Programs for Canine Anatomy <http://www.tabanat.com>

Virtual Canine Anatomy <http://www.cvmb.colostate.edu/vetneuro/VCA3/vca.html>

Veterinary anatomy museum <http://vanat.cvm.umn.edu/museum/>

Veterinary neurobiology laboratory preview/review <http://vanat.cvm.umn.edu/neurolab/>



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Carnivore and developmental anatomy lectures <http://vanat.cvm.umn.edu/TFFlect.html>  
Rooney's guide to the dissection of the horse <http://www.vet.cornell.edu/oed/horsedissection/>  
Interactive drawings for veterinary anatomists <http://www.images4u.com/>  
Veterinary anatomy: directions and planes <http://vanat.cvm.umn.edu/anatDirections/>  
Canine planar anatomy <http://vanat.cvm.umn.edu/planar/>  
Gaits: gait foot-fall patterns <http://vanat.cvm.umn.edu/gaits/>  
Sheep brain dissection guide <http://academic.uofs.edu/department/psych/sheep/>  
Anatomical Society of Great Britain and Ireland, <http://www.anatsoc.org.uk/>  
Sheep brain atlas <https://www.msu.edu/~brains/brains/sheep/index.html>  
Neuroanatomy correlation lab <http://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 (b)              | G.T.S (d) |
| First Year - First Semester<br>General Anatomy and Embryology<br>5 hours / week | 1- Introduction and technical anatomical terminology.  | 1                 | 1                                    | 1                         | 1                    | 1-8       |
|   | 2- General osteology (skeletons, types of bones, bone structure).  | 1                 | 1                                    | 1                         | 1                    |           |
|   | 3- General arthrology (definition, classification of joints, movement of joints).  | 2, 3              | 1, 2                                 | 1, 2                      | 1, 2                 |           |
|   | 4- General embryology (embryological terms, Gametogenesis, ovulation, fertilization, cleavage, gastrulation, placentaion).         | 4, 5, 6, 7, 8     | 6                                    | 9                         | 9                    |           |
|   | 5- Special arthrology (joints of the equine thoracic limb, joints of the equine pelvic limb).                                      | 9, 10, 11, 12, 13 | 2, 5                                 | 1, 2, 4, 5, 6, 11, 17, 18 | 1, 2, 4, 5, 6, 11    |           |
|   | 6- Bones of the thoracic limb of different domestic animals (scapula, humerus, radius and ulna, carpus, metacarpus, digits, hoof). | 2, 3, 4, 5, 6     | 1, 2, 4                              | 1, 2, 3, 4, 11            | 1, 2, 3, 4, 11       |           |
|   | 7- Dissection of the equine thoracic limb (muscles of the lateral aspect, muscles of the medial aspect, blood vessels, nerves).    | 7, 8, 9, 10       | 1, 2, 4, 5                           | 1, 2, 5, 6, 7, 8, 11      | 1, 2, 5, 6, 7, 8, 11 |           |
|   | 8- Bones of the pelvic limb of different domestic animals (os-coxae, femur, tibia and fibula, tarsus, metatarsus).                 | 11, 12, 13        | 1, 2, 4, 5                           | 1, 2, 3, 4, 7, 8, 11      | 1, 2, 3, 4, 7, 8, 11 |           |

| Topic   |  | Week           | Intended learning outcomes of course |                        |            |           |
|---|--|----------------|--------------------------------------|------------------------|------------|-----------|
|   |  |                | K&U                                  | I.S (b)                | I.S (b)    | G.T.S (d) |
| First Year - Second Semester<br>Special Anatomy and Embryology<br>5 hours / week<br>(Lec. 2hrs/wk - Pract. 3hrs/wk) | 1- Gross anatomy of animals' respiratory system (nostrils, nasal cavity, paranasal sinuses, nasopharynx, larynx, trachea, lungs, mediastinum, pleura). | 1, 2, 3, 4, 5  | 3, 4, 5                              | 1,10,11,12,13,14,17,18 | 3,5,6,11   | 1-8       |
|   | 2- Gross anatomy of equine cardiovascular system except head and neck (heart, coronary arteries, thoracic aorta, abdominal aorta).                     | 6, 7, 8, 9, 10 | 3, 4, 5                              | 1,10,11,13,14,17,18    | 3,6,11     |           |
|   | 3-Fowl anatomy (external features, skeleton, digestive system, respiratory system, urinary system, male genital system, female genital system).        | 11, 12         | 5, 7                                 | 15, 16                 | 3,7,8,9,11 |           |
|   | 4- Fish anatomy (external features, skeleton, digestive system, respiratory system, urinary system, male genital system, female genital)               | 13             | 5, 7                                 | 15                     | 3,10,11    |           |
|   | 5- Dissection of the equine pelvic limb (muscles of the lateral aspect, muscles of the medial aspect, blood vessels, nerves).                          | 3, 4, 5, 6     | 1, 2, 4, 5                           | 1,2,5,6,7,8,11         | 3,4,11     |           |
|   | 6- Dissection of the equine thorax (thoracic cage, muscles, vessels and nerves of the thoracic wall, thoracic cavity).                                 | 9, 10, 11      | 1, 2, 4, 5                           | 1,2,7,8,11             | 2,3,4,5,11 |           |