

Amendments to the BVSc. Student Handbook of the Batch 2020/21
Faculty of Veterinary Medicine and Animal Science
University of Peradeniya

Dear Students of the Batch 2020/21,

This is an official communication regarding the revisions made to the BVSc. curriculum of the semesters one and two of the first year. These amendments have been approved and effective immediately for the batch 2020/21. An updated version of the handbook will be available with the subsequent amendments that will be effective for the 2nd, 3rd, 4th and 5th academic years in the due course.

Revisions made are as follows.

1. Veterinary Anatomy and Physiology I, II and III will be offered as separate four courses, namely Veterinary Anatomy I, II and Veterinary Physiology I, II during the first year (semesters 1 and 2) and will not be continued into semester 3 (second year).
2. Veterinary Anatomy I and II will be offered as two five-credit courses in semesters 1 and 2; Veterinary Physiology I and II will be offered as four and three-credit courses in semesters 1 and 2 respectively.
3. Animal Science I was previously offered in semester 1. This will be offered as two one-credit courses in semesters 1 (Animal Restraint & Handling) and 2 (Animal Welfare & Behaviour).
4. Professional Studies I and II were offered as a two and one-credit course, respectively, in semesters 1 and 2 previously. This will be offered as a one and two-credit course, respectively, in semesters 1 and 2.
5. English I and II were previously offered as two credit (non-GPA) courses in semesters 1 and 2. These will now be offered as one credit (non-GPA) courses extending from semesters 1-4.
6. Animal Science II (three credits) previously offered in semester 2 will be shifted to the semester 3.
7. Course structure and the course specifications of the revised courses of the first academic year (semesters 1 and 2) are available in Table 1 and Annexure 1 respectively.

Table 1: Existing and proposed course structure of the first year (semester 1 and semester 2) of the BVSc 2020 curriculum

Semester	Course code	Course Title	Credit Value
Year 1 Semester 1	VS1101	Veterinary Anatomy I	5
	VS1102	Biochemistry I*	3
	VS1103	Professional Studies I	1
	VS1104	Animal Restraining and Handling	1
	VS1105	English I	1 (Non-GPA)
	VS1106	Integrated Veterinary Sciences I*	1
	VS1107	Veterinary Physiology I	4
Year 1 Semester 2	VS1207	Veterinary Anatomy II	5
	VS1208	Biochemistry II*	3
	VS1209	Professional Studies II	2
	VS1210	Animal Welfare and Behaviour	1
	VS1211	English II	1 (Non-GPA)
	VS1212	Integrated Veterinary Sciences II*	1
	VS1213	Veterinary Physiology II	3

*Courses that were not revised

Dean,
Faculty of Veterinary Medicine and Animal Science
26. 04. 2023

Annex 1

Specifications of the revised courses to be offered in the first year (semester 1 and 2) of the BVSc 2020 curriculum

Semester:	1		
Course Code:	VS1101		
Course Name:	Veterinary Anatomy I		
Credit Value:	5 (Notional hours: 250)		
Pre-requisites:	None		
Core/Optional	Core		
Hourly Breakdown	Lecture hrs	Practical class hrs	Independent Learning & Assessment hrs
	45	60	145
Course Aim: To impart knowledge on the topographic, macroscopic, microscopic, and developmental anatomy of the cardiovascular, respiratory, musculoskeletal (axial and thoracic limb), and endocrine systems of domestic animals to enable the student to be able to apply this knowledge and practice in techniques of the discipline in subsequent years of the veterinary curriculum as required.			
Intended Learning Outcomes: At the end of the course, with reference to the cardiovascular, respiratory, musculoskeletal (axial and thoracic limb), and endocrine systems of domestic animals, the student should be able to: <ul style="list-style-type: none"> • describe their topographic, macroscopic and microscopic anatomy. • perform the skills (dissection, microscopic skills) gained in the above discipline. • apply the above knowledge to differentiate normal from abnormal conditions in domestic animals. • link the above knowledge and apply them to clinical problems/ situations as required. 			
Course Content: Cell biology; Basic tissues; Lymphatic system; General embryology, Musculoskeletal system – axial skeleton and forelimb, Cardiovascular system; Respiratory system; Endocrine system.			
Teaching /Learning Methods: Lectures and practical classes.			
Assessment Strategy:			
Continuous Assessment: 20 %		Final Assessment: 80%	
Details: Mid-semester (Theory) 10% OSPE/ spots 10%		Theory (%) 40	Spots (%) 40
Recommended Reading: <ol style="list-style-type: none"> i. Dyce, K.M., W.O. Sack and C.J.G. Wensing (2010). Textbook of Veterinary Anatomy (4th Ed.). Saunders Elsevier Inc., St. Louis, Missouri, U.S.A. ii. Eurell, J.A. and B.L. Frappier (2006). Dellman’s Textbook of Veterinary Histology (6th Ed.). Blackwell Publishing Ltd., Ames, Iowa, U.S.A. iii. McGeady, T.A., P.J. Quinn, E.S. Fitzpatrick, M.T. Ryan, D. Kilroy and P. Lonergan (2017). Veterinary Embryology (2nd Ed.). Blackwell Publishing Ltd., Oxford, U.K. 			

Semester:	1		
Course Code:	VS1103		
Course Name:	Professional Studies I		
Credit Value:	1 (Notional hours: 50)		
Pre-requisites:	None		
Core/Optional	Core		
Hourly Breakdown	Lecture hrs	Practical class hrs	Independent Learning & Assessment hrs
	10	10	30
Course Aim:			
To develop students' understanding of professional and personal aspects of being a veterinarian, including their obligations to themselves, colleagues, University, profession and the society			
Intended Learning Outcomes:			
At the end of the course students should be able to;			
<ul style="list-style-type: none"> • explain and display behavior that is consistent with their role as professionals, both in and outside the class • apply basic concepts of education to veterinary undergraduate studies, • explain, in the context of a veterinary professional, basic principles of psychology, including sensation, perception, memory processes, motivation and learning, • explain the importance of, and be able to adopt strategies for a healthy lifestyle by managing stress, emotions and improving social awareness, • display professional behavior befitting of a veterinarian, including ethical conduct, honesty and integrity as responsible members of the society and university's community 			
Course Content:			
Introduction to the veterinary profession; day-1 competencies of BVSc graduate; effective learning habits; self-management, including time and stress management, mindfulness, physical wellbeing and personal financial planning; basic concepts of education, and human behavior including introductions to sociology and psychology; partnership between the student and the university, ethics, and expected conduct from the students, and consequences of misconduct (student bylaws).			
Teaching /Learning Methods:			
Lectures and practical classes.			
Assessment Strategy:			
Continuous Assessment: 50 %		Final Assessment: 50%	
Details:		Theory (%)	OSPE and Viva (%)
Mid-semester - OSPE and Viva 50%		20	30
Recommended Reading:			
<ol style="list-style-type: none"> i. Robert J. Brym and John Lie (2005). Sociology. (2nd Ed.). Wadsworth/ Thomson Learning. USA. ii. Paul Hersey, Blanchard K.H. and Johnson D.E. (2003).. Management of organizational behavior. (8th Ed.) Prentice Hall of India. iii. Stephen Robbins, and T.A. Robbins (2007). Organizational behavior. (12th Ed.). Prentice Hall. iv. Wayne Weiten (2004). Psychology Themes and Variations. (6th Ed.). Wadsworth/ Thomson Learning. USA v. Stephen R. Covey (1989). The 7 Habits of highly effective people. Simon Schuster. Australia and Sydney. 			

Semester:	1			
Course Code:	VS1104			
Course Name:	Animal Restraining and Handling			
Credit Value:	1 (Notional hours: 50)			
Pre-requisites:	None			
Core/Optional	Core			
Hourly Breakdown	Lecture hrs	Demonstrations hrs	Practical class hrs	Independent Learning & Assessment hrs
	04	05	12	29
Course Aim: To introduce the basic principles of handling and restraining of common domestic animal species in Sri Lanka.				
Intended Learning Outcomes: At the end of the course, the student should be able to: <ul style="list-style-type: none"> • select an appropriate method of handling and restraint and use these methods effectively and safely. • assess the risks involved in handling and restraining the animal • monitor the animal's response to handling and restraint and take appropriate action if there is a negative reaction. • Identify your own limitations and ensure that you meet the legal responsibilities if any. 				
Course Content: Why animals may require handling and restraint, safe and effective methods of handling different animals and the equipment used, balance lines, blind spots, possible risks involved in handling and how to minimize and respond to them.				
Teaching /Learning Methods: Lectures, demonstrations and practical classes.				
Assessment Strategy:				
Continuous Assessment: 20 %			Final Assessment: 80%	
Details: Mid-semester - MCQ 20%			Theory (%) 20	OSPE (%) 60
Recommended Reading: <ol style="list-style-type: none"> Animal Handling Study Guide (2018). Massey University RS Anderson and ETB Edney (1991). Practical Animal Handling.(1st Ed.). Pergamon Press Kevin J Stafford (1997). Cattle Handling Skills. Massey University, New Zealand Safe Cattle Handling (2014). Good Practice Guidelines, New Zealand 				

Semester:	1		
Course Code:	VS1105		
Course Name:	English I		
Credit Value:	1 (Notional hours: 50)		
Pre-requisites:	None		
Core/Optional	Core (None GPA)		
Hourly Breakdown	Lecture hrs	In-class Assignments hrs	Independent Learning & Assessment hrs
	05	20	25
Course Aim:			
To introduce students to Academic English so that they will be able to cope with the change of the medium of instruction from Sinhala/Tamil to English			
Intended Learning Outcomes:			
At the end of the course students should be able to;			
<ul style="list-style-type: none"> • construct grammatically accurate sentences, engage in formal writing processes of approximately 500 words. • apply reading comprehension skills in reading general and academic texts. • use the English language effectively to communicate with peers, including articulating ideas and opinions, providing explanations, and generating discussions. • use general words and veterinary-specific terms appropriately when communicating in disciplinary contexts and professional clinical settings. 			
Course Content:			
Reading: Selected reading passages describing people, places, disciplinary themes (250 –500 words), texts with appropriate punctuation exercises (full stop, comma, colon, semi-colon, quotation marks, apostrophe), relevant passages with appropriate and sequenced vocabulary elements from Basic Sciences.			
Writing: Short descriptions of self, immediate environment and selected disciplinary themes from Veterinary Anatomy, Physiology and Biochemistry of up to 500 words, comparing and contrasting information, laboratory reports, clinical histories, formal and informal letters, email and similar communication.			
Listening: Instructions and directions, announcements, basic questions and answers, discourse markers (e.g., when comparing and contrasting, talking about similarities, additions, cause and effects, giving examples, marking sequence, etc.), and conjunctions/connectives, short speeches and dialogues, telephone conversations related to general and disciplinary themes.			
Speaking: Sharing personal information appropriately, using and explaining quantitative and qualitative data at a basic level, making short speeches, asking and answering questions, communicating in disciplinary contexts and professional clinical settings			
Teaching /Learning Methods:			
Lectures and in-class assignments.			
Assessment Strategy:			
Continuous Assessment: 40 %		Final Assessment: 60%	
Details:		Theory (%)	Other (%)
Mid-semester - Theory 40%		60	
Recommended Reading:			
i. Amundson, R. J (2015). An illustrated guide to veterinary medical terminology. Albany NY.– 1999.–125–131 p.			
ii. Herriot, J (1995). James Herriot’s Favorite Dog Stories. Martin’s Press.			
iii. Herriot, J (1998). All Creatures Great and Small. Macmillan.			
iv. Hewings, M (2013). Advanced grammar in use with answers: A self-study reference and practice book for advanced learners of English. Cambridge university press.			

Semester:	1				
Course Code:	VS1107				
Course Name:	Veterinary Physiology I				
Credit Value:	4 (Notional hours: 200)				
Pre-requisites:	None				
Core/Optional	Core				
Hourly Breakdown	Lecture hrs	In-class Assignment hrs	Practical class hrs	Independent Learning & Assessment hrs	
	30	30	30	110	
Course Aim:					
To introduce the students to principles of physiology with emphasis on homeostasis and neuromuscular, endocrine, cardiovascular, immune and respiratory systems of domestic animals in order to apply this knowledge and skills in the subsequent years of veterinary curriculum.					
Intended Learning Outcomes:					
At the end of the course students should be able to;					
<ul style="list-style-type: none"> • explain the scientific basis of physiological mechanisms. • explain the physiological mechanisms of the blood, immune, nerve, muscle, and secretory cells. • describe the physiological mechanisms of neuromuscular, endocrine, cardiovascular, immune and respiratory systems and appreciate the relationship between such systems. • perform relevant laboratory tests and field examinations to assess physiological functions of above systems. • relate physiological principles of above systems to clinical problems. 					
Course Content:					
General physiology concepts, Physiology of blood, Basic immunology, Physiology of excitable tissues, Basic neurophysiology, Physiology of locomotion, Endocrine physiology, Cardiovascular physiology, Respiratory physiology and Exercise physiology					
Teaching /Learning Methods:					
Lectures, in-class assignments and practical classes					
Assessment Strategy:					
Continuous Assessment: 30 %			Final Assessment: 70%		
Details: Mid-semester (Theory) 20% Quizzes – 10%			Theory (%) 40	Spot (%) 15	OSPE (%) 15
Recommended Reading:					
<ol style="list-style-type: none"> i. William O. Reece, Howard H. Erickson, Jesse P. Goff, Etsuro E. Uemura (2015). Dukes' Physiology of Domestic Animals (13th Ed.). Wiley Blackwell ii. Øystein Sjaastad, Olav Sand, Knut Hove (2016). Physiology of Domestic Animals (3rd Ed.). Scandinavian Veterinary Press iii. Eric P. Widmaier, Hershel Raff, Kevin T. Strang (2019). Vander's Human Physiology (15th Ed.). McGraw-Hill Education iv. Sindhu Sonia, Rose Manoj Kumar, Gupta Meenakshi (2015). Practical Veterinary Physiology (1st Ed.). Kalyani Publishers 					

Semester:	2		
Course Code:	VS1207		
Course Name:	Veterinary Anatomy II		
Credit Value:	5 (Notional hours: 250)		
Pre-requisites:	Veterinary Anatomy I		
Core/Optional	Core		
Hourly Breakdown	Lecture hrs	Practical class hrs	Independent Learning & Assessment hrs
	45	60	145
Course Aim: To impart knowledge on the topographic, macroscopic, microscopic, and developmental anatomy of the digestive, musculoskeletal (pelvic limb), urogenital, integumentary, and nervous systems of domestic animals to enable the student to be able to apply this knowledge and practice in techniques of the discipline in subsequent years of the veterinary curriculum as required.			
Intended Learning Outcomes: At the end of the course, with reference to the digestive, musculoskeletal (pelvic limb), urogenital, integumentary, and nervous systems of domestic animals, the student should be able to: <ul style="list-style-type: none"> • describe their topographic, macroscopic and microscopic anatomy. • perform the skills (dissection, microscopic skills) gained in the above discipline. • apply the above knowledge to differentiate normal from abnormal conditions in domestic animals. • link the above knowledge and apply them to clinical problems/ situations as required. 			
Course Content: (<i>Only main topics</i>) Digestive system; Musculoskeletal system – hindlimb; Urinary system, Reproductive system, Integument; Nervous system and Sensory organs.			
Teaching /Learning Methods: Lectures and practical classes.			
Assessment Strategy:			
Continuous Assessment: 20 %		Final Assessment: 80%	
Details: Mid-semester – Theory 10% OSPE/ Spots - 10%		Theory (%) 40	Spots (%) 40
Recommended Reading: <ol style="list-style-type: none"> Dyce, K.M., W.O. Sack and C.J.G. Wensing (2010). Textbook of Veterinary Anatomy (4th Ed.). Saunders Elsevier Inc., St. Louis, Missouri, U.S.A. Eurell, J.A. and B.L. Frappier (2006). Dellman’s Textbook of Veterinary Histology (6th Ed.). Blackwell Publishing Ltd., Ames, Iowa, U.S.A. McGeady, T.A., P.J. Quinn, E.S. Fitzpatrick, M.T. Ryan, D. Kilroy and P. Lonergan (2017). Veterinary Embryology (2nd Ed.). Blackwell Publishing Ltd., Oxford, U.K. 			

Semester:	2		
Course Code:	VS1209		
Course Name:	Professional Studies II		
Credit Value:	2 (Notional hours: 100)		
Pre-requisites:	None		
Core/Optional	Core		
Hourly Breakdown	Lecture hrs	Practical class hrs	Independent Learning & Assessment hrs
	15	30	55
Course Aim: To further develop communication skills required by a veterinary professional			
Intended Learning Outcomes: At the end of the course students should be able to; <ul style="list-style-type: none"> • describe the principles of verbal and nonverbal communication and listening, and apply these in interpersonal, small group, public, and organizational contexts, and to obtain a complete, organized, patient-centered history while building a rapport with the client, • explain the value of human-animal bond, explain various cultural and societal attitudes towards animals and the implication of such attitudes on human-animal relationships and impact of companion animals on human health, • demonstrate communication skills to deal with situations such as grief, anger, conflict resolution, referrals and euthanasia • apply key aspects of sociology for the understanding of personal and client behavior, and communicate effectively across multiple cultures • understand demographic characteristics of clients including rural small holder farmers in Sri Lanka and effectively communicate and work with them as a leader. • communicate formally using letters, emails, voice calls, other digital platforms, social and mass media, and carryout an effective scientific presentation using Microsoft PowerPoint. 			
Course Content: An introduction to communication; effective writing skills (email and letter); effective presentation skills; human animal bond; four core skills of communication and Calgary Cambridge guide; dealing with grief and anger and communicating mistakes; conflict/ dispute resolution; culture, communication and media, telephone etiquette, understanding diverse veterinary clients.			
Teaching /Learning Methods: Lectures and practical classes.			
Assessment Strategy:			
Continuous Assessment: 50 %		Final Assessment: 50%	
Details: Mid-semester – Essay and SEQ 20% OSPE and or Viva 30%		Theory (%)	OSPE and Viva (%) 50
Recommended Reading: <ol style="list-style-type: none"> Gray, C. & Moffett, J (2013). Handbook of Veterinary Communication Skills (1st Ed). John Wiley & Sons., Chichester, UK Hill, P. Warman, S. & Shawcross, G (2011). One Hundred Top Consultations in Small Animal General Practice (1 st Ed.). Wiley Blackwell, Chichester, UK Powell, L., Rozanski, E. A. & Rush, J. E (2010). Small Animal Emergency and Critical Care Case Studies in Client Communication, Morbidity and Mortality (1 st Ed.) Wiley Blackwell, Ames, Iowa Hall, J.R., Grindstaff, L., & Lo, M. (Eds.) (2012). Handbook of Cultural Sociology. Routledge. Vogt, P.L. (1917). Introduction to Rural Sociology. D. Appleton and Company. 			

Semester:	2		
Course Code:	VS 1210		
Course Name:	Animal Behavior and Welfare		
Credit Value:	1 (Notional hours: 50)		
Pre-requisites:	None		
Core/Optional	Core		
Hourly Breakdown	Lecture hrs	Practical class hrs	Independent Learning & Assessment hrs
	12	06	32
Course Aim: To introduce the fundamental principles of behaviour (ethology) and welfare of common domestic animal species and how these two aspects are compromised during management and role of veterinarian in animal welfare and behaviour.			
Intended Learning Outcomes: At the end of the course, the student should be able to: <ul style="list-style-type: none"> • describe normal behaviour of a range of domestic and captive animal species. • recognise common abnormal behaviours in a range of domestic and captive animal species. • describe common ethical perspectives on the use of animals. • explain what animal welfare is, why it matters and how it can be assessed. 			
Course Content: Tinbergen’s four questions (Ultimate and Proximate causes) of behavior; adaptive significance of a behavior trait in captive animals; normal and abnormal behavior of common domestic and captive animals; domestic animal behavioral concepts in respect to handling and restrain; handling of fearful and anxious animals; animal welfare -two schools of thought on animal welfare; ethics and animal welfare; parameters of animal welfare; development of animal welfare assessment protocols; animal welfare legislature in Sri Lanka; international animal welfare legislature and the role of OIE in maintaining adequate animal welfare; religious animal slaughter; euthanasia and culling; animal transport and welfare; use of animals in experimentation.			
Teaching /Learning Methods: Lectures and practical classes.			
Assessment Strategy:			
Continuous Assessment: 30 %		Final Assessment: 70%	
Details: Mid-semester - MCQ 30%	Theory (%) 40	OSPE (%) 30	
Recommended Reading: <ol style="list-style-type: none"> i. Appleby M. C., Mench J. A., Olsson I. A., & Hughes B. A (2001). Animal Welfare (2nd Ed.). CABI ii. Broom D. M. & Fraser, A. F (2015). Domestic Animal Behaviour and Welfare (5th Ed.). CABI 			

Semester:	2		
Course Code:	VS 1211		
Course Name:	English II		
Credit Value:	1 (Notional hours: 50)		
Pre-requisites:	None		
Core/Optional	Core (None GPA)		
Hourly Breakdown	Lecture hrs	Practical class hrs	Independent Learning & Assessment hrs
	05	20	25
Course Aim: To enable students to further develop their English language skills in order to meet the academic demands of the BVSc Study Program.			
Intended Learning Outcomes: At the end of the course, the student should be able to: <ul style="list-style-type: none"> i. read, understand and respond to texts of academic and general in nature. ii. write paragraphs that are academic in nature up to 500-700 words after summarizing and synthesizing information. iii. demonstrate referencing and citation styles in different forms of written texts. iv. make short speeches and converse in a variety of settings. 			
Course Content: Reading: academic and professional texts (ex: research papers, case studies) from the main field and sub-fields of Veterinary Medicine and Animal Science, reading comprehension passages of general and specific interest to undergraduates taken from anatomy, physiology and biochemistry (of 500-800 words). Writing: academic and professional text writing (approximately 700 words), visuals (tables, charts, graphs), summarizing and paraphrasing and synthesizing information, data commentaries (qualitative and quantitative), reference and citation style guide. Listening: short lectures on veterinary-specific areas, answering listening comprehension exercises, identification of main ideas of verbal/visual texts and providing evidence. Speaking: making impromptu speeches, conducting small-group discussions, delivering short speeches on given topics.			
Teaching /Learning Methods: Lectures and practical classes.			
Assessment Strategy:			
Continuous Assessment: 40 %		Final Assessment: 60%	
Details: Mid-semester – Theory 40%	Theory (%) 60	Other (%)	
Recommended Reading: <ul style="list-style-type: none"> i. Amundson, R. J (2015). An illustrated guide to veterinary medical terminology. Albany NY.– 1999.–125–131 p. ii. Englar, R (2019). Writing Skills for Veterinarians. 5m Books Ltd. iii. Herriot, J (1995). James Herriot’s Favorite Dog Stories. Martin’s Press. iv. Herriot, J (1998). All Creatures Great and Small. Macmillan. v. Hewings, M (2013). Advanced grammar in use with answers: A self-study reference and practice book for advanced learners of English. Cambridge university press 			

Semester:	2				
Course Code:	VS 1213				
Course Name:	Veterinary Physiology II				
Credit Value:	3 (Notional hours: 150)				
Pre-requisites:	None				
Core/Optional	Core				
Hourly Breakdown	Lecture hrs	In-class Assignments hrs	Practical class hrs	Field visits hrs	Independent Learning & Assessment hrs
	30	20	04	06	90
Course Aim: To provide students with a basic understanding of the fundamental processes and physiological mechanisms of digestive, renal, female and male reproductive systems and lactation of domestic animals in order to apply this knowledge and skills in the subsequent years of veterinary curriculum.					
Intended Learning Outcomes: At the end of the course, the student should be able to: <ul style="list-style-type: none"> i. describe the physiological and control mechanisms of digestive processes of domestic animals. ii. describe the physiology of renal functions of domestic animals. iii. explain the hormonal regulation, gametogenesis, reproductive cycle and behavior, pregnancy, parturition and lactation of domestic animals. iv. perform relevant laboratory tests and field examinations to assess physiological functions of above systems. v. relate physiological principles of above systems to clinical problems. 					
Course Content: (<i>Only main topics</i>) Physiology of digestion, Renal physiology, Environmental physiology, Physiology of female reproduction, Physiology of male reproduction, Physiology of avian reproduction and Lactation physiology					
Teaching /Learning Methods: Lectures, in-class assignment, practical classes and field visits					
Assessment Strategy:					
Continuous Assessment: 30 %			Final Assessment: 70%		
Details: Mid-semester – Theory 20% Quizzes – 10%			Theory (%) 40	Spots (%) 30	
Recommended Reading: <ul style="list-style-type: none"> i. William O. Reece, Howard H. Erickson, Jesse P. Goff, Etsuro E. Uemura (2015). Dukes' Physiology of Domestic Animals (13th Ed.). Wiley Blackwell ii. Øystein Sjaastad, Olav Sand, Knut Hove (2016). Physiology of Domestic Animals (3rd Ed.). Scandinavian Veterinary Press iii. Eric P. Widmaier, Hershel Raff, Kevin T. Strang (2019). Vander's Human Physiology (15th Ed.). McGraw-Hill Education iv. Sindhu Sonia, Rose Manoj Kumar, Gupta Meenakshi (2015). Practical Veterinary Physiology (1st Ed.). Kalyani Publishers 					