

Course Syllabus CAPS 301 Human Physiology

CAPS 301 - Human Physiology:

A lecture course on body function with particular reference to mammalian and human physiology. Please consult course director and UBC Calendar for prerequisites.

This is a third-year level 6 credit course; 72 – 76 lecture hours; Two terms course.

For Winter session, both Term-1 and Term-2 must be taken during the same session of the academic year. For Summer session, both Term-1 and Term-2 must be taken during the same summer session of the academic year.

Course Director:

Dr. Barry Mason

Life Science Centre Rm. 1382

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Text book:

Suggested: **HUMAN PHYSIOLOGY**, From Cells to Systems; Lauralee Sherwood and Robert Kell, Latest Canadian Edition, Nelson

MindTap Course Key: MTPN-M7PN-JQX3

Assessment:

Course grade determined by multiple choice question (MCQ) examination for both Term I & Term II.

There will be 4 non-cumulative MCQ exams – a midterm and a final for each semester.

There are 2 MCQ questions allocated to each lecture. The total number of questions are determined by the total number of exams.

Grade breakdown: Each term (midterm plus final) is worth 50% of overall mark.

**Students must write all 4 examinations before a final mark is assigned.

Class Location and Class Schedule:

Monday, Wednesday, Friday, 11:00 a.m. – 12:00 p.m.; IRC Lecture Hall #2

Detailed Schedule below:

Topic	HOURS	DATES	Faculty
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TERM 1: 2020

Neurophysiology	7	Sept. 9, 11, 14, 16, 18, 21, 23	Mason
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CNS	12	Sept. 25, 28, 30, Oct. 2, 5, 7, 9, 14, 16, 19, 21, 23	Mason
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Midterm 1		Oct 26	
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Muscle	4	Oct. 28, 30, Nov 2, 4	Moukhles
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Body Fluids/Blood	5	Nov. 6, 9, 13, 16	Hull
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Cardiovascular	7	Nov. 18, 20, 23, 25, 27, 30, Dec. 2	Acilli
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TERM 2: 2021

Pulmonary	8	Jan. 4, 6, 8, 11, 13, 15, 18, 20	Osborne
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Renal	8	Jan. 22, 25, 27, 29 Feb. 1, 3, 5, 8	Hull
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Midterm 2		Feb. 12	
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Gastrointestinal	7	Feb. 22, 24, 26 Mar. 1, 3, 5, 8,	Mason
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Endocrinology I	5	Mar. 10, 12, 15, 17, 19	Kindler
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Endocrinology II	3	Mar. 22, 24, 26	Johnson
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Reproduction	3	Mar. 29, 31, Apr. 7	Kindler
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IMPORTANT DATES:

W1 2020

Sept. 8 First day of Term I

Term II

Oct. 12 Thanksgiving

Oct 26 Midterm I

Nov. 11 Remembrance Day

Dec. 03 Last day of Classes

Classes

Dec. 7–22 Examination Period
period

W2 2021

Jan. 4 First day of

Feb 12 Midterm 2

Feb. 15 Family Day

Feb. 15 – 19 Winter Break

Apr. 8 Last day of

Apr. 12 – 27 Examination

CAPS 301: COURSE OUTLINE.

Term 1

Neurophysiology

Ionic basis of resting potentials, Nernst equation. Voltage-gated ion channels and the action potential. Refractoriness. Myelination and saltatory conduction. Electrical and chemical synapses. Ligand-gated ion channels. EPSPs and IPSPs. The neuromuscular junction. Overview of the autonomic nervous system and autonomic reflexes.

CNS and Special Senses

Overview of functional anatomy of CNS and motor, sensory and autonomic function of cranial and spinal nerves. General properties of sensory receptors. Synaptic transmission in spinal cord. Spinal reflexes. Muscle spindle and muscle tone. Spinal, brainstem and cortical mechanisms in transmission of touch, proprioception pain and temperature. Corticospinal and corticobulbar systems. Functions of cerebellum and basal ganglia. Functions of the visual, vestibular and auditory systems.

Muscle

Comparison of structure/function relationships in smooth, cardiac and skeletal muscle. Excitation-contraction coupling. Neuromuscular junction.

Body fluids/Blood

Distribution and composition of body fluids. Composition and functions of blood: formed elements and plasma. Regulation of Haemopoiesis: iron metabolism, heme formation, haemoglobin synthesis. Functions and formation of platelets. Haemostasis: platelet aggregation, plug formation, biological and classical model of coagulation, clot formation and retraction, and fibrinolysis. Prevention and disorder of haemostasis.

Cardiovascular Physiology

Systemic and pulmonary circulations. Electrical and mechanical events during cardiac cycle. Neuronal, hormonal and intrinsic control of cardiovascular function. Starling's forces and fluid exchange. Blood pressure control and heart failure.

Term 2

Pulmonary Physiology

Structure of respiratory system. Pressure/volume relationships in airways and lung. Control of airway caliber. Ventilatory muscles and mechanical aspects of ventilation. Gas exchange in alveoli. Pulmonary circulation. Gas transport in blood. Respiration and acid/base balance. Control of ventilation.

Renal Physiology

Functional anatomy of the kidney. Renal circulation. Glomerular filtration. Concept of Clearance. Renal tubular transport and handling of solutes. Renal handling of sodium and potassium. Renal regulation of acid/base. Formation of dilute and concentrated urine. Regulation of body fluid osmolality and volume. Functional anatomy of bladder. Micturition.

Gastrointestinal Physiology

Functional anatomy of digestive tract. Functions of various GI polypeptides. Neuronal and hormonal control of exocrine secretions of salivary, gastric, pancreatic and intestinal glands. Functions of the Liver and the formation of bile. Regulation of bile secretion and its functions. Functions and control of GI motility. Digestion and absorption of nutrients, including sugars, carbohydrates and fats, in the GIT. Distribution and functions of intestinal microbata.

Endocrine

Hormones: classes, modes of delivery, transport and action. Pituitary gland and pituitary-hypothalamus interactions. Endocrine regulation of growth. Synthesis and function of thyroid hormones. Adrenal gland. Thyroid and metabolism. Endocrine control of calcium metabolism and circulating Ca^{++} levels. Role of renin-angiotensin-aldosterone in electrolyte homeostasis and body fluid volume/osmolality maintenance. Regulation of “fuel homeostasis” – insulin, glucose, cortisol, adrenaline, growth hormone.

Reproduction

Structure of male and female reproductive systems. Testis and spermatogenesis. Role of hormones of the hypothalamo-pituitary-gonadal axis in male and female reproduction. Ovary and follicular development. Menstrual cycle. Placenta. Hormonal control of pregnancy.

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available [here](https://senate.ubc.ca/policies-resources-support-student-success) (<https://senate.ubc.ca/policies-resources-support-student-success>)