

# The Hong Kong Polytechnic University

## Subject Description Form

<b>Subject Code</b>	ABCT2326
<b>Subject Title</b>	Human Physiology
<b>Credit Value</b>	3
<b>Level</b>	2
<b>Pre-requisite / Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	By completing this subject using an organ system-based approach in teaching and learning, students will be able to demonstrate a basic understanding of the function of the human body and the physiological mechanisms of the operation of major body systems.
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to: <ul style="list-style-type: none"> <li>(a) Demonstrate a basic understanding of the different levels from cells to systems of body organization;</li> <li>(b) Understand the function and inter-relatedness of the major body systems;</li> <li>(c) Describe the basic physiologic mechanisms of how body systems work and interact;</li> <li>(d) Discuss the importance of communication and homeostasis at different levels of body organization in health and disease;</li> <li>(e) Collect and interpret the data derived from scientific experimentation to address physiological question.</li> </ul>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b><u>Indicative Content</u></b></p> <p><b>Introduction to cell physiology</b> (structure and function of cell organelles; plasma membrane; cytoplasm and its organelles; nucleus and gene expression; protein synthesis and secretion; DNA synthesis and cell division)</p> <p><b>Level of body organization from cells to systems</b> (homeostasis and feedback control; primary tissues; organization of organs and systems)</p> <p>Body systems including</p> <ol style="list-style-type: none"> <li>1) <b>Respiratory system</b> (structure of respiratory system; physical aspects of ventilation; mechanics of breathing; gas exchange; transport of blood gases; regulation of breathing; control of ventilation rate)</li> <li>2) <b>Cardiovascular system</b> (structure of heart; cardiac cycle; electrical activity of heart; nervous and endocrine control of cardiac function; blood composition; overview of blood vessels; systemic, pulmonary and lymphatic circulations; cardiac output; haemodynamics and regulation of blood flow)</li> <li>3) <b>Renal system</b> (structure of renal system; structure and function of nephron; glomerular filtration; water and salt reabsorption; renal plasma clearance; renal control of electrolyte and acid base balance)</li> <li>4) <b>Digestive system</b> (digestion and absorption; from mouth to stomach; small intestine; large intestine; digestive role of liver, gallbladder and pancreas; neural and endocrine regulation of digestive process)</li> <li>5) <b>Nervous system</b> (structure and function of neurons and synapses; electrical activity of neurons; overview of membrane potential, grade potential and action</li> </ol>

	<p>potential; mechanism of neurotransmission; organization and function of central and peripheral nervous system and autonomic nervous system; sensory and motor cortex)</p> <p>6) <b>Reproductive system</b> (male and female reproductive physiology; endocrine regulation of reproduction; menstrual cycle; fertilization and pregnancy)</p> <p>7) <b>Endocrine system</b> (endocrine glands; classification and function of hormones; mechanisms of hormone action; control of hormone secretion; pituitary, adrenal, thyroid glands and pancreas; autocrine and paracrine regulation; physiological link of nervous and endocrine systems)</p> <p>8) <b>Musculoskeletal system</b> (structure of skeletal muscle; classification of muscle and muscle contraction, mechanism of muscle contraction; energy requirement of skeletal muscle; neural control of muscle contraction; structure of bone and cartilage; growth and remodeling of bone; calcium homeostasis)</p> <p>9) <b>Immune system</b> (defense mechanisms; B and T lymphocytes; active and passive immunity; diseases caused by immune system)</p>																																	
<p><b>Teaching/Learning Methodology</b></p>	<p><b>Lecture</b> will be used to explain and impart understanding of the factual material including basic concepts and principles of physiology. Mass lecturing with the aids of multimedia tools such as animations will be adopted to facilitate the conceptual learning of the students.</p> <p><b>Tutorial</b> will be used to supplement lectures. The tutorial will be conducted separately based on the grouping of health professional disciplines. Tutorial will include the use of interactive multimedia, online activities and case study to reinforce important concepts. Class activities involving physiological problems in health professions will be designed to engage students' learning in regard to their health care disciplines.</p> <p><b>Laboratory Practical</b> will be used to introduce the scientific experimentation consisting of data collection and interpretation for addressing physiological questions. Practical will be focused on the investigation of cardiovascular, pulmonary and endocrine physiological response to different stimuli.</p>																																	
<p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b></p>	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>1. Continuous Assessment</td> <td>50%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Examination</td> <td>50%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><i>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</i></p> <p><b>Continuous Assessment</b> In-class quizzes and mid-term test will be used to assess the intended learning outcomes (a) to (d). The continuous assessment will also consist of practical laboratory reports which will assess the intended learning outcome (e).</p> <p><b>Examination</b> The examination will consist of multiple choice questions and short questions. The questions will be designed to assess the intended learning outcomes (a) to (d).</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a	b	c	d	e	1. Continuous Assessment	50%	✓	✓	✓	✓	✓	2. Examination	50%	✓	✓	✓	✓		Total	100%					
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2. Examination	50%	✓	✓	✓	✓																													
Total	100%																																	
	<p>Class contact:</p>																																	

<b>Student Study Effort Expected</b>	▪ Lecture	24 Hrs
	▪ Tutorial	12 Hrs
	Additional Activity:	
	▪ Laboratory	6 Hrs
	Other student study effort:	
	▪ Independent study and preparation for mid-term test and examination	65 Hrs
	Total student study effort:	107 Hrs
<b>Reading List and References</b>	<p><b><u>Textbook</u></b>  Martini FH, Nath JL and Bartholomew EF. (2015). <i>Fundamentals of Anatomy and Physiology</i> (10th ed.). Pearson, ISBN 10:0-321-73553-6.</p> <p>Human Physiology (2015) 14<sup>th</sup> Ed. Fox SI. Publisher: McGraw Hill.</p> <p>Seeley's Anatomy and Physiology (2010) 9<sup>th</sup> Ed. Vanputte C, Regan J &amp; Russo A. Publisher: McGraw Hill.</p> <p><b><u>Suggested Reference Books</u></b>  Vander's Human Physiology: The Mechanisms of Body Function (2010) 12<sup>th</sup> Ed. Widmaier EP, Raff H &amp; Strang KT. Publisher: McGraw Hill.</p>	