### Subject Outline

**Subject Name:** Human Biological Science 1  
**Subject Code:** BIOH111

#### SECTION 1 - GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Award/s:</th>
<th>Total Course Credit Points:</th>
<th>Level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Health Science (Acupuncture)</td>
<td>128</td>
<td>1st Year</td>
</tr>
<tr>
<td>Bachelor of Health Science (Naturopathy)</td>
<td>128</td>
<td>1st Year</td>
</tr>
<tr>
<td>Bachelor of Health Science (Nutritional and Dietetic Medicine)</td>
<td>96</td>
<td>1st Year</td>
</tr>
<tr>
<td>Bachelor of Health Science (Myotherapy)</td>
<td>96</td>
<td>1st Year</td>
</tr>
<tr>
<td>Bachelor of Complementary Medicine</td>
<td>48</td>
<td>2nd Year</td>
</tr>
</tbody>
</table>

**Duration:** 1 Semester  
**Subject Coordinator:** Robyn Friend (Brisbane campus)  
**Subject is:** Core  
**Subject Credit Points:** 4

#### Student Workload:

<table>
<thead>
<tr>
<th>No. timetabled hours per week:</th>
<th>No. personal study hours per week:</th>
<th>Total hours per week:</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

**Delivery Mode:**  
- **Face to Face** (On campus): 2 x 2 hour lectures, 2 x 1 hour tutorials  
- **e-Learning** (Online): Narrated PowerPoint presentations, Tutorials: Asynchronous tutor moderated discussion forum and activities, Student handouts and web-based resources  
- **Intensive Delivery** (Summer School): Contact hours are delivered over 5 weeks with 4 x 4 hour days delivered per week  
  - Content: Combination lecture and tutorial activities  
  - Assessment: Online Quiz - Week 2; Written Assignment - Week 2; Concept Map - Week 5; Final Written Exam - Week 6  
  - Full Time  
  - Part Time

**Pre-requisites:** Nil  
**Co-requisites:** Nil

#### SECTION 2 – ACADEMIC DETAILS

**Subject Rationale**  
Human Biological Science 1 introduces students to the concepts of human anatomy and physiology, from the scientific concept of the cell, through the various levels of structural organisation to the organism as a whole. Students will develop conceptual understanding of the skeletal, muscular, nervous, endocrine and integumentary systems by considering their components, structure and functions. This subject also explores how these body systems integrate to maintain homeostasis within the body and participate in control mechanisms, growth, development and replacement. A basic knowledge and understanding of the structure and functioning of cells, tissues and organs of healthy people is essential for subsequent studies in pharmacology and pathology, and for laying the foundation for developing problem solving skills required in the clinical setting.
Learning Outcomes

1. Identify and describe components of the cells, relate them to their individual functions and apply this to define and describe cellular processes essential to life, including transcription, translation and cell division.

2. Define and discuss the different types of tissue structure and function.

3. Describe the anatomy and physiology of the integumentary system and relate this to the process of wound healing and burns.

4. Identify and apply appropriate anatomical terminology, including anatomical positions, directional terms, planes and sections to describe position of the different systems in the human body.

5. Describe the anatomy and physiology of the skeletal system, and extend this into the importance of blood calcium levels and facilitation of movement.

6. Explain the sliding filament theory in the context of muscle physiology and describe muscle anatomy and metabolism.

7. Explain the mechanism of action potential and release of neurotransmitters and relate this to the anatomy and physiology of the whole nervous system, including CNS, PNS and ANS.

8. Describe and relate the structure and function of reflex arcs and explain their importance in facilitating information between PNS and CNS or ANS.

9. Describe the anatomy and physiology of the endocrine system and apply this to the importance of homeostasis and its maintenance by feedback systems.

10. Demonstrate an integrated knowledge of the anatomy and physiology of the skeletal, muscular, nervous, endocrine and integumentary systems, and how they contribute to homeostasis in the human body.

Assessment Tasks

<table>
<thead>
<tr>
<th>Type</th>
<th>Learning Outcomes Assessed</th>
<th>Session Content Delivered</th>
<th>Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Quiz</td>
<td>1-2</td>
<td>1-5</td>
<td>Week 5</td>
<td>20%</td>
</tr>
<tr>
<td>multiple choice, definitions and diagrams (50 minutes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written Assignment</td>
<td>1-6 &amp; 10</td>
<td>1-12</td>
<td>Non-teaching Week</td>
<td>15%</td>
</tr>
<tr>
<td>(1000 words)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept Map</td>
<td>10</td>
<td>1-21, 23-25</td>
<td>Week 13</td>
<td>20%</td>
</tr>
<tr>
<td>Final Written Exam</td>
<td>3-9</td>
<td>1-21, 23-25</td>
<td>Final Examination Period</td>
<td>45%</td>
</tr>
<tr>
<td>multiple choice, short answers, definitions and extended responses (2 hours)</td>
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</table>

All written assessments and online quizzes are due at 11:55 p.m. and submitted through the LMS
Prescribed Readings:

Recommended Readings:

### Subject Content

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Tutorials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Session 1</strong>&lt;br&gt;Introduction (Subject Outline / Subject Aims / Assessment / Teaching Resources)&lt;br&gt;Levels of Organisation&lt;br&gt;Homeostasis&lt;br&gt;The Cellular Level of Organisation&lt;br&gt;• Cytoplasm, organelles and nucleus</td>
<td>Activities are developed to allow the students to explore relevant concepts, expand on ideas and have peer and lecturer interaction. Activities also allow for formative assessment and feedback&lt;br&gt;• Interconnection of cellular organelles&lt;br&gt;• Hands-on activity: DNA extraction</td>
</tr>
<tr>
<td>Session 2</td>
<td>The Cellular Level of Organisation&lt;br&gt;• Central dogma: Transcription and translation&lt;br&gt;• Plasma membrane structure&lt;br&gt;• Plasma membrane function: Passive and active transport</td>
<td>• Revision of transcription and translation processes&lt;br&gt;• Model of plasma membrane&lt;br&gt;• Hands-on activity: Osmosis/ Diffusion experiments</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Session 3</strong>&lt;br&gt;The Cellular Level of Organisation&lt;br&gt;• Cellular communication – vesicular transport&lt;br&gt;  o Endocytosis&lt;br&gt;  o Exocytosis&lt;br&gt;  o Extracellular matrix</td>
<td></td>
</tr>
<tr>
<td>Session 4</td>
<td><strong>Session 4</strong>&lt;br&gt;The Cellular Level of Organisation&lt;br&gt;• Cellular communication – signalling&lt;br&gt;  o Cell division: mitosis and meiosis&lt;br&gt;  o Cell death</td>
<td>• Online activity describing the process of cell signalling&lt;br&gt;• Microscope-based activity with worksheets describing process of mitosis</td>
</tr>
<tr>
<td>Session</td>
<td>The Tissue Level of Organisation</td>
<td>Microscope-based activity with worksheets describing epithelial, connective, muscle and nervous tissue</td>
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<td>---------</td>
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<tr>
<td>5</td>
<td>The Tissue Level of Organisation</td>
<td>Microscope-based activity with worksheets describing epithelial, connective, muscle and nervous tissue</td>
</tr>
<tr>
<td>Session 6</td>
<td>The Integumentary System – Structure and Function of the Skin</td>
<td>Microscope-based activity with worksheets describing epithelial, connective, muscle and nervous tissue</td>
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<tr>
<td>4</td>
<td>Session 7</td>
<td>Support for the Written Assignment</td>
</tr>
</tbody>
</table>
| Session 8 | An Introduction to Medical Terminology | • Discussion of the role of medical terminology in reading and writing science information  
• Practising the use of and interpretation of medical terminology using worksheets in class |
<p>| 5       | Session 9                       | The Skeletal System                                                                              |
| 6       | Session 11                      | The Muscular System                                                                               |
| 7       | Session 13                      | The Muscular System                                                                               |</p>
<table>
<thead>
<tr>
<th>Session 14</th>
<th>Revision Session</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NON-TEACHING WEEK</strong> (note that make-up classes may be scheduled in this week)</td>
<td></td>
</tr>
<tr>
<td><strong>Semester 1</strong> - This aligns with the week after Easter so it may fall between Weeks 6 to 8</td>
<td></td>
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<tr>
<td><strong>Semester 2 &amp; Online students</strong> - The non-teaching week falls between Weeks 7 and 8</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Session 15</th>
<th>The Nervous System</th>
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</thead>
<tbody>
<tr>
<td>Overview to the major components and organisation of the nervous system</td>
<td></td>
</tr>
<tr>
<td>Histology of nervous tissue</td>
<td></td>
</tr>
<tr>
<td>Neurons, neuroglia and myelination</td>
<td></td>
</tr>
<tr>
<td>Interactive tutorial around division of nervous system and neuron structure/function relationship</td>
<td></td>
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<tr>
<td>Interactive myelination tutorial followed by student summary</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 16</th>
<th>The Nervous System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical signals – The action potential</td>
<td></td>
</tr>
<tr>
<td>The synapse and neurotransmitters</td>
<td></td>
</tr>
<tr>
<td>Regeneration and repair of the nervous system</td>
<td></td>
</tr>
<tr>
<td>Worksheets describing action potential initiation and propagation</td>
<td></td>
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<tr>
<td>Interactive tutorial on the final actions of the action potential at the synapse – neurotransmitters classes, EPSP and IPSP</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 17</th>
<th>The Nervous System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain organisation and protection</td>
<td></td>
</tr>
<tr>
<td>The brain stem: Structure &amp; function</td>
<td></td>
</tr>
<tr>
<td>The cerebellum: Structure &amp; function</td>
<td></td>
</tr>
<tr>
<td>The diencephalon: Structure &amp; function</td>
<td></td>
</tr>
<tr>
<td>The cerebrum: Structure &amp; function</td>
<td></td>
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<tr>
<td>Cranial nerves</td>
<td></td>
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<tr>
<td>Use of the Virtual Body for learning brain anatomy</td>
<td></td>
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<tr>
<td>Cranial nerves and functional neuroanatomy</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 18</th>
<th>The Nervous System</th>
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</thead>
<tbody>
<tr>
<td>Sensation</td>
<td></td>
</tr>
<tr>
<td>Somatic sensations</td>
<td></td>
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<tr>
<td>The special senses</td>
<td></td>
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<tr>
<td>Olfaction</td>
<td></td>
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<tr>
<td>Gustation</td>
<td></td>
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<tr>
<td>Vision</td>
<td></td>
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<tr>
<td>Hearing and equilibrium</td>
<td></td>
</tr>
<tr>
<td>Interactive worksheet outlining the initiation of the action potential through sensation</td>
<td></td>
</tr>
<tr>
<td>Worksheets outlining physiology of different special senses</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 19</th>
<th>The Nervous System</th>
</tr>
</thead>
<tbody>
<tr>
<td>The spinal cord anatomy</td>
<td></td>
</tr>
<tr>
<td>The spinal cord physiology</td>
<td></td>
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<tr>
<td>Reflex arcs</td>
<td></td>
</tr>
<tr>
<td>Use of the Virtual Body for learning spinal cord and spinal nerves anatomy</td>
<td></td>
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<tr>
<td>Worksheet outlining components of the reflex arcs</td>
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<table>
<thead>
<tr>
<th>Session 20</th>
<th>The Nervous System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal nerves</td>
<td></td>
</tr>
<tr>
<td>Somatic sensory and motor pathways</td>
<td></td>
</tr>
<tr>
<td>Use of the Virtual Body for learning spinal cord and spinal nerves anatomy</td>
<td></td>
</tr>
<tr>
<td>Interactive worksheet from Session 18 consolidating the initiation of action potential with the sensory and motor tracts and final motor output</td>
<td></td>
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<tr>
<td>11. Session 21</td>
<td>The Autonomic Nervous System:</td>
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<tr>
<td>----------------</td>
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</tr>
<tr>
<td>- Anatomy of the ANS</td>
<td></td>
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<tr>
<td>- Physiology of ANS</td>
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<tr>
<td>- Reflex arcs</td>
<td></td>
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<tr>
<td>- Neurotransmitters of the ANS</td>
<td></td>
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<tr>
<td>- Physiological effects and control of the ANS</td>
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</tr>
<tr>
<td>• Worksheet outlining components of the ANS reflex arcs and its comparison with the somatic reflex arcs</td>
<td></td>
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<tr>
<td>• Case-based identification and description of two ANS subdivisions</td>
<td></td>
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<tr>
<td>• ANS control</td>
<td></td>
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<table>
<thead>
<tr>
<th>Session 22</th>
<th>The Endo-cannabinoid System</th>
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<tbody>
<tr>
<td>• Interactive session on the contemporary system that integrates nervous system with receptor biology and regulation of homeostasis</td>
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<table>
<thead>
<tr>
<th>12. Session 23</th>
<th>The Endocrine System</th>
</tr>
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<tbody>
<tr>
<td>- Endocrine glands</td>
<td></td>
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<tr>
<td>- Hormone activity</td>
<td></td>
</tr>
<tr>
<td>- Hormone mechanisms and control</td>
<td></td>
</tr>
<tr>
<td>• Biochemical nature of hormones</td>
<td></td>
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<tr>
<td>• Worksheet on hormone cellular actions</td>
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<table>
<thead>
<tr>
<th>Session 24</th>
<th>The Endocrine System</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Hypothalamus, pituitary, thyroid and parathyroid glands</td>
<td></td>
</tr>
<tr>
<td>- Formation, actions and control of hormone secretion</td>
<td></td>
</tr>
<tr>
<td>• Use of interactive worksheets in class outlining anatomy and physiology of specific glands</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>13. Session 25</th>
<th>The Endocrine System</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Pancreas, adrenals and other glands</td>
<td></td>
</tr>
<tr>
<td>- Formation, actions and control of hormone secretion</td>
<td></td>
</tr>
<tr>
<td>- Integration of hormone actions into hormonal system axes</td>
<td></td>
</tr>
<tr>
<td>• Use of interactive worksheets in class outlining anatomy and physiology of specific glands</td>
<td></td>
</tr>
<tr>
<td>• Case studies consolidating endocrine axes</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 26</th>
<th>Integration of Nervous and Endocrine Systems Revision Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stress response as an example of nervous and endocrine system integration</td>
<td></td>
</tr>
<tr>
<td>• Revision and integration of knowledge – exam preparation</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14. Non-Teaching Week/Practical Examination Week 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note that make-up classes may be scheduled in this week</td>
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</table>

<table>
<thead>
<tr>
<th>15. Non-Teaching Week/Practical Examination Week 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note that make-up classes may be scheduled in this week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16. Final Examination Week 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>On campus enrolled students: Refer to the Examination Timetable for your local campus for the exact day and time of exam</td>
</tr>
<tr>
<td>Online enrolled students: You are required to sit examinations on campus per the Examination Policy - Higher Education. The Examination Weeks for subjects offered online are identified in the Online Calendar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17. Final Examination Week 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>On campus enrolled students: Refer to the Examination Timetable for your local campus for the exact day and time of exam</td>
</tr>
<tr>
<td>Online enrolled students: You are required to sit examinations on campus per the Examination Policy - Higher Education. The Examination Weeks for subjects offered online are identified in the Online Calendar</td>
</tr>
</tbody>
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