## COURSE OUTLINE

### SBI102

<table>
<thead>
<tr>
<th>Course:</th>
<th>Biology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Code:</td>
<td>SBI102</td>
</tr>
<tr>
<td>Times &amp; Location:</td>
<td>On-line</td>
</tr>
<tr>
<td>Course Coordinator:</td>
<td>Juana M. Gonzalez-Santos, PhD</td>
</tr>
<tr>
<td>Instructors/Teaching Assistants:</td>
<td><a href="mailto:Jgonzalez-santos@ccnm.edu">Jgonzalez-santos@ccnm.edu</a></td>
</tr>
<tr>
<td>E-mail:</td>
<td><a href="mailto:Jgonzalez-santos@ccnm.edu">Jgonzalez-santos@ccnm.edu</a></td>
</tr>
<tr>
<td>Office Hours:</td>
<td></td>
</tr>
<tr>
<td>Office Location:</td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation:

<table>
<thead>
<tr>
<th></th>
<th>PERCENT</th>
<th>TEST DATE / DUE DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Quizzes</td>
<td>20</td>
<td>Two quizzes per week</td>
</tr>
<tr>
<td>1 Assignment</td>
<td>5</td>
<td>TBA</td>
</tr>
<tr>
<td>Tutorials</td>
<td>5</td>
<td>Weekly</td>
</tr>
<tr>
<td>Midterm Test (online)</td>
<td>30</td>
<td>TBA</td>
</tr>
<tr>
<td>Final Exam (with a proctor)</td>
<td>40</td>
<td>TBA</td>
</tr>
</tbody>
</table>

Plagiarism and cheating are academic offenses and will be treated seriously by the College. Students should refer to the College’s policies on academic misconduct posted on in the [Academic Calendar](#).
Course Description

Human Biology (SBI102) is a 3-credit, 8-week introductory course that will provide students with a solid core foundation in basic and applied human biology. Through on-line self-study modules, tutorials, quizzes, exercises, and assignments, students will learn to use relevant terminology and concepts in a biological context. The course will introduce the structure and function of tissues and organ systems.

Students will have complete weekly on-line self-study modules and will interact online with the course instructor one evening a week in an on-line tutorial session. Students are expected to be prepared for these tutorial sessions (i.e. have completed the on-line modules), and will be graded using a variety of assessments including quizzes, tests, assignments/labs, and a final exam. Most of the assigned material will come from the required course textbook.

The application of biology fundamentals to naturopathic medicine is integrated throughout the course, providing students with a unique opportunity to learn biology within the context of naturopathic medicine.

Course Outcomes:

This course is designed to:
• A core foundation for their knowledge of cellular and molecular biology
• The basis for applying biological concepts to the human body
• Use the relevant vocabulary and concepts correctly in a biological and clinical context
• Acquire an understanding of the known mechanisms by which the cells and organisms function and achieve homeostasis
• Challenge and engage the student where he/she may independently work to enrich their learning.
• Equip students with the necessary knowledge to enter the ND program. Where applicable, apply human biology to Naturopathic principles.

Required Texts:


Recommended Texts and other readings:

Any first year university or introductory biology or physiology text will prove to be a useful reference. Selected PowerPoint slides from lectures, supplementary resources, and assignments will be weekly posted in Moodle.
Prerequisites:

There are no prerequisites required for this course.

Course Format:

Each course is delivered in a blended learning style which combines online self-study modules with weekly live interactive online tutorial sessions from 7:30 - 9 p.m. ET (one evening per week) with the course instructor. The passing grade is 60% and evaluations/assessments will consist of tutorial attendance/participation (5%), one quiz per module (20%), one assignment (5%), as well as one midterm exam (30%) and a final exam (40%) which are invigilated at CCNM’s testing centre as part of the course, or under the guidance of a suitable invigilator (college/university or secondary school academic professional, librarian, or testing centre) in your local area, costs of which will be the responsibility of the student.

Biology (SBI102) Schedule

<table>
<thead>
<tr>
<th>Module</th>
<th>Topics</th>
<th>Activities</th>
<th>Due Date</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Nervous System</td>
<td>Quiz 1</td>
<td>TBA</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>2</td>
<td>Sensory System</td>
<td>Quiz 2</td>
<td>TBA</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>3</td>
<td>The Endocrine System</td>
<td>Quiz 3</td>
<td>TBA</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>4</td>
<td>Blood</td>
<td>Quiz 4</td>
<td>TBA</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>5</td>
<td>The Cardiovascular System</td>
<td>Quiz 5</td>
<td>TBA</td>
<td>Chapter 11 and 12</td>
</tr>
<tr>
<td>6</td>
<td>Body Defense Mechanisms</td>
<td>Quiz 6</td>
<td>TBA</td>
<td>Chapter 12 and 13</td>
</tr>
<tr>
<td>7</td>
<td>The respiratory System</td>
<td>Quiz 7</td>
<td>TBA</td>
<td>Chapter 14</td>
</tr>
<tr>
<td>8</td>
<td>The Digestive System</td>
<td>Quiz 8</td>
<td>TBA</td>
<td>Chapter 15</td>
</tr>
<tr>
<td>9</td>
<td>The Urinary System</td>
<td>Quiz 9</td>
<td>TBA</td>
<td>Chapter 16</td>
</tr>
<tr>
<td>10</td>
<td>The Reproductive System</td>
<td>Quiz 10</td>
<td>TBA</td>
<td>Chapter 17</td>
</tr>
<tr>
<td>11</td>
<td>Review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Biology (SBI102) Learning Outcomes

Module 1: The Nervous System (Chapter 8)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
- Compare the functions of the central and peripheral, somatic and autonomic, and parasympathetic and sympathetic divisions of the nervous system.
- Identify the location and list the function of each component of the central nervous system.
- Describe the function of the somatic and autonomic nervous systems and the sympathetic and parasympathetic nervous systems.
- Explain the cause and seriousness of common health problems and injuries of the nervous system.

Focus on: Drugs and the Mind
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
- Describe the mechanism of psychoactive drugs.
- Differentiate between tolerance, cross-tolerance, and physical tolerance.
- List the effects of alcohol on the various body systems, nutrition, cancer, and fetal development.
- Explain the effects of THC and the long-term effects of marijuana on the body.
- List the stimulants described in the chapter and describe how each of these stimulants acts on the CNS.
- Describe the danger of hallucinogenic drugs.
- Compare the positive and negative aspects of opiates.

Module 2: Sensory System (Chapter 9)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
- Explain the term sensory receptors.
- List the five classes of sensory receptors and their stimuli.
- Differentiate between general senses and special senses.
- Label the parts of the eye and explain the function of each part in the perception of sight.
- Label the parts of the ear and describe the role of each part in hearing.
- Explain how we perceive and maintain balance.
- Describe the mechanism of taste buds and olfactory receptors.

Module 3: The Endocrine System (Chapter 10)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Explain the role of hormones as chemical messengers and give an example of hormone regulation.
· List the effect of each of the six anterior pituitary hormones and the two posterior pituitary hormones.
· Describe the effect of thyroid hormone, including oversecretion and undersecretion.
· Explain the regulation of blood calcium by calcitonin and parathyroid hormone.
· Name and describe the effects of the hormones produced by the adrenal gland.
· Compare the effects of the two pancreatic hormones, glucagon and insulin, on the regulation of glucose blood level.
· Describe the effect of the thymus gland on the health of the immune system.
· Relate the production of melatonin to seasonal affective disorder and name the gland that is involved.
· Define prostaglandins and describe their mechanism of action as compared with endocrine hormones.

Focus on: Diabetes mellitus

Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· List the four types of diabetes, their characteristics, and their prevalence.
· Distinguish between type 1 and type 2 diabetes in terms of their symptoms, diagnosis, treatment, and prognosis.
· Summarize the symptoms, diagnosis, and treatment of gestational diabetes, emphasizing the unique characteristics.

Module 4: Blood (Chapter 11)

Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· List the functions of blood.
· Describe the composition of blood and the function of platelets, red blood cells, and each type of white blood cell.
· Explain the cause and treatment of the various types of anemia and leukemia.
· Explain how antibodies and antigens determine blood type and transfusion relationships.
· Sequence the steps leading to a blood clot.

Module 5: The Cardiovascular System (Chapter 12)

Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· List the functions of the cardiovascular system.
· Compare the structure of arteries, veins, and capillaries and explain how the structure facilitates the function of each type of vessel.
· Contrast the exchange of gas in the pulmonary and systemic circuits.
· Describe the internal conduction system of the heart and the resulting cardiac cycle.
· Define blood pressure and differentiate between systolic and diastolic pressure.
Focus on: Cardiovascular Diseases
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Answer the question: Why is cardiovascular disease important to understand?
· Distinguish between a thrombus and an embolism and explain their dangers and treatment.
· Describe hypertension and atherosclerosis, explain why they are life-threatening, and present treatment options including lifestyle changes.
· Differentiate between a heart attack and progressive heart failure.
· Provide specific data on the impact of cigarette smoking on cardiovascular disease.
· List heart-healthy lifestyle habits.

Module 6: Body Defense Mechanisms (Chapter 12 and 13)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Describe the functions and structures of the lymphatic system.
· Use the word pathogen to explain why our body needs a defense mechanism.
· Describe in detail each of the three lines of defense.
· Define antigen and MHC markers and explain their role in cell identity.
· Compare an antibody-mediated immune response with a cell-mediated immune response.
· List the steps in an adaptive immune response, the cells that are involved, and the mechanism of defense.
· Differentiate between active and passive immunity.
· Describe monoclonal antibodies and list some of their uses.
· Explain the cause of autoimmune disorders and the development of an allergic reaction.
Focus on: Infectious Diseases
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Define pathogen, list the pathogens discussed in the chapter, and provide an example of each.
· List the mechanisms by which disease can be spread.
· Define epidemiology, sporadic diseases, endemic diseases, epidemic disease, and pandemic.

Module 7: The respiratory System (Chapter 14)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· List the four functions of the respiratory system. List the organs/structures of the respiratory system, and explain their role in gas exchange.
· Explain how inhalation and exhalation are accomplished, including the muscles that are involved and the changes in air pressure.
· Describe how oxygen and carbon dioxide are carried in the blood and exchanged within the tissues.
· Discuss the respiratory control centers in the brain and how the level of blood gases affects breathing rate.
· Identify various disorders of the respiratory system, including their symptoms and treatment.

Module 8: The Digestive System and Nutrition (Chapter 15)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Describe the passage of food through the gastrointestinal tract from the mouth to the anus.
· Explain the function of each organ and accessory organ of the digestive system and describe any specialized structural features.
· Compare neural and hormonal control of digestion and give examples of each.
· Describe a well-balanced diet as represented by MyPlate.
· State the dietary value of lipids, carbohydrates, proteins, vitamins, minerals, and water.
· List the information found on a food label and explain how that information can help you make healthy choices.
· Explain how the body uses energy and what happens to excess food calories.
· Define the Body Mass Index (BMI), explain how it can be used to determine a desirable weight, and then explain the risks of being overweight.
· Describe the characteristics of successful weight-loss programs.
· Compare obesity, anorexia nervosa, and bulimia and explain how they are serious health risks.

Focus on: The Obesity Epidemic
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Describe obesity, including an explanation of the Body Mass Index (BMI).
· Discuss the health risks of obesity, including possible cardiovascular problems, the incidence and implications of Type 2 Diabetes, and cancer.
· Describe the regulation of food intake as governed by the hypothalamus, hormones, and epigenetics.
· Explain the components of weight management and the yo-yo effect of weight loss and gain.
Module 9: The Urinary System (Chapter 16)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· List the organs and systems that eliminate waste.
· Identify and give the function of each of the organs of the urinary system.
· Explain the role of the kidneys in maintaining homeostasis in the body.
· Describe the structure of the nephron and the processes of glomerular filtration, tubular reabsorption, and tubular secretion.
· Explain the role of the kidney in the maintenance of acid-base balance, red blood cell production, activation of vitamin D, and water conservation including the relevant hormonal control.
· Differentiate between acute and chronic renal failure and describe the processes of dialysis and kidney transplant surgery.
· Explain the voluntary and involuntary components of urination and the causes of urinary incontinence.
· Name various urinary tract infections and identify common causes of these infections.

Module 10: The Reproductive System (Chapter 17)
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· State the function of the gonads.
· Compare and contrast the roles of the male and female in reproduction.
· Describe the function of each organ of the male reproductive system, the development of sperm, the formation of semen, and hormonal control of male reproduction.
· Describe the function of each organ of the female reproductive system; the ovarian and uterine cycles and the interplay between them; and the hormonal control of the female reproductive system.
· Explain the causes and symptoms of health problems of the female reproductive system.
· List the stages involved in the human sexual response and the physiological changes that accompany them.
· Name each method of birth control presented in the chapter and explain how it works, why it prevents pregnancy, and its relative effectiveness.

Focus on: Sexually Transmitted Diseases and AIDS
Learning Objectives
After reading the textbook and studying the material in this chapter, the student should be able to:
· Describe the long-lasting effects of STDs and STIs.
· Differentiate between the treatments and/or cures for STDs caused by bacteria and for those caused by viruses.
· Develop a table listing the symptoms, causative organisms, and treatments of chlamydia, gonorrhea, syphilis, genital herpes, and genital warts.
· Explain the progression of an HIV infection and its diagnosis as AIDS.