

## WTCS Repository

10-806-179 Adv Anatomy & Physiology

# Course Outcome Summary

### Course Information

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|  | Description | This course is the second semester in a two-semester sequence that studies normal human anatomy and physiology using a body systems approach with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization through learning and laboratory activities.  The course continues examination of these topics: cellular metabolism; individual components of body systems; and homeostatic mechanisms and their relationship to fluid, electrolyte, acid-base balance and blood.  The course also includes integration of genetics to human reproduction and development.  |
|  | Total Credits | 4 |

### Course History

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|  | Last Revision Date | 3/24/2025 |
|  | Revised By | Owen Smith (smitho) |

Pre/Corequisites

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| Prerequisite | Each Wisconsin Technical College determines the General Education course prerequisites used by their academic institution. If prerequisites for a course are determined to be appropriate, the final Course Outcome Summary must identify the prerequisites approved for use by the individual Technical College. |

### Course Competencies

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| 1. | Analyze how the individual components of the nervous system work as an integrated whole |
|  | Assessment Strategies |
|  | 1.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 1.1. | examine sensory function |
|  | 1.2. | examine motor and sensory neural pathways |
|  | 1.3. | describe the role of the autonomic nervous system in maintaining homeostasis |
|  | 1.4. | describe neuro-physiology including potential generation, impulse conduction and synaptic transmission |
|  | 1.5. | evaluate the actions of neurotransmitters |
| 2. | Analyze how the individual components of the endocrine system work as an integrated whole |
|  | Assessment Strategies |
|  | 2.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 2.1. | relate endocrine function to homeostasis |
|  | 2.2. | identify the advanced mechanisms of hormone actions |
|  | 2.3. | identify the mechanism of hormone transport |
|  | 2.4. | correlate the relationship of neural function and hormonal secretion |
|  | 2.5. | correlate the major hormones to the tissues and organs that secrete them |
|  | 2.6. | correlate the major hormones to their respective target tissues |
|  | 2.7. | explain control of hormone secretion |
|  | 2.8. | describe hormonal response to physiological stress |
| 3. | Analyze the processes of cellular metabolism |
|  | Assessment Strategies |
|  | 3.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 3.1. | compare the processes of aerobic and anaerobic respiration |
|  | 3.2. | distinguish between anabolism and catabolism |
|  | 3.3. | compare the mechanism of carbohydrate, lipid and protein metabolism |
|  | 3.4. | correlate appropriate cellular organelles and transport mechanisms with their roles in cellular metabolism |
| 4. | Correlate muscle physiology to normal body function |
|  | Assessment Strategies |
|  | 4.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 4.1. | identify the microscopic anatomy of the muscle fiber |
|  | 4.2. | identify the physiology of muscle contraction |
|  | 4.3. | explain the physiology involved in myoneural junctions |
|  | 4.4. | explain energy production, storage and consumption in the muscle cell |
| 5. | Analyze the roles of DNA and RNA in controlling cell function and genetics  |
|  | Assessment Strategies |
|  | 5.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 5.1. | describe DNA replication |
|  | 5.2. | show relationship to enzyme production |
|  | 5.3. | describe effect of mutations on cell function |
|  | 5.4. | contrast DNA and RNA structures and functions |
|  | 5.5. | distinguish among the three types of RNA |
|  | 5.6. | describe the processes involved in protein synthesis |
| 6. | Evaluate the components of defense and immunity that support homeostasis |
|  | Assessment Strategies |
|  | 6.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 6.1. | correlate blood components and composition to homeostasis |
|  | 6.2. | distinguish among active and passive immunity |
|  | 6.3. | describe the components of the immune system |
|  | 6.4. | describe specific and nonspecific immunity |
| 7. | Analyze cardiovascular physiology to normal body function |
|  | Assessment Strategies |
|  | 7.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 7.1. | examine the conduction system of the heart |
|  | 7.2. | examine the coronary circulation system |
|  | 7.3. | examine blood flow dynamics |
|  | 7.4. | analyze factors affecting blood pressure |
|  | 7.5. | relate extrinsic and intrinsic factors that influence cardiac function |
|  | 7.6. | correlate the cardiac cycle with EKG and blood flow dynamics |
| 8. | Analyze renal physiology |
|  | Assessment Strategies |
|  | 8.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 8.1. | correlate nephron structure to filtration, re-absorption and secretion |
|  | 8.2. | analyze factors affecting urine formation |
|  | 8.3. | explain the role of the juxtaglomerular apparatus |
|  | 8.4. | explain the role of the kidney's vascular system in urine formation |
|  | 8.5. | explain the normal and abnormal constituents of urine and their significance |
| 9. | Evaluate the roles of different organ systems in maintaining adequate tissue perfusion and oxygenation |
|  | Assessment Strategies |
|  | 9.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 9.1. | explain the mechanisms that influence hemodynamics |
|  | 9.2. | include mechanisms responsible for controlled blood flow through tissues |
|  | 9.3. | include compensatory mechanisms |
|  | 9.4. | explain how alterations in blood, pC02, pH, and p02 influence ventilation |
|  | 9.5. | include the exchange of oxygen and carbon dioxide in the tissues and lungs |
|  | 9.6. | explain the mechanisms of gas transport |
| 10. | Distinguish among the processes of digestion, absorption, and assimilation |
|  | Assessment Strategies |
|  | 10.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 10.1. | examine absorption of nutrients |
|  | 10.2. | examine transport and storage of nutrients |
|  | 10.3. | examine regulations of digestive processes |
|  | 10.4. | examine the role of the liver, gall bladder and pancreas in digestive and related metabolic functions |
| 11. | Correlate fluid, electrolyte and acid-base balance to the homeostatic mechanisms responsible for their control |
|  | Assessment Strategies |
|  | 11.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 11.1. | identify fluid compartments and the water and solute movement between them |
|  | 11.2. | describe the mechanisms by which the water and electrolyte content of the body fluid is regulated |
|  | 11.3. | compare the composition of intracellular and extracellular fluids |
|  | 11.4. | describe mechanisms for regulating pH |
|  | 11.5. | describe acidosis, alkalosis, and compensatory mechanisms |
| 12. | Integrate genetics, development and human reproductive physiology |
|  | Assessment Strategies |
|  | 12.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 12.1. | compare mitosis with meiosis |
|  | 12.2. | distinguish between spermatogenesis and oogenesis |
|  | 12.3. | describe the events of fertilization/fetal development |
|  | 12.4. | recognize fetal circulation |
|  | 12.5. | describe the hormonal control of reproductive cycles |
|  | 12.6. | evaluate the patterns of human inheritance |
| 13. | Use appropriate scientific laboratory methods and safety precautions |
|  | Assessment Strategies |
|  | 13.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 13.1. | identify hazards and safety equipment in the lab |
|  | 13.2. | select appropriate personal protective equipment |
|  | 13.3. | follow all laboratory practice expectations of the college |