



*essentials of*  
**Human**  
**Anatomy &**  
**Physiology**

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STANDARDS	PAGE REFERENCES
<b>Human Anatomy and Physiology</b>	
<p><b>Course Description</b>  Human Anatomy and Physiology is a laboratory science course that consists of an in-depth study of the body systems that maintain homeostasis from anatomical, physiological, and histological perspectives. Students explore the body's structures and functions through an inquiry approach.</p>	
<b>Embedded Inquiry</b>	
<p><b>Conceptual Strand</b>  <i>Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21<sup>st</sup> century.</i></p>	
<p><b>CLE 3251.Inq.1</b> Recognize that science is a progressive endeavor that reevaluates and extends what is already accepted.</p>	<p><b>Student Edition:</b>  2, 50, 116, 211, 289, 507, 538  <i>Genetics Connection</i> 394-395, 464, 562-563  <i>Topic of Interest</i> 90-91, 196, 308-309, 528-529, 544, 550-551</p>
<p><b>CLE 3251.Inq.2</b> Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts, and compare opposing theories.</p>	<p><b>Student Edition:</b>  See the Laboratory Manual for <i>Hole's Essentials of Human Anatomy and Physiology</i>. This manual contains 49 laboratory exercises and reports, which are integrated closely to the textbook.</p>

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<b>CLE 3251.Inq.3</b> Use appropriate tools and technology to collect precise and accurate data.	<b>Student Edition:</b> See the Laboratory Manual for <i>Hole's Essentials of Human Anatomy and Physiology</i> . This manual contains 49 laboratory exercises and reports, which are integrated closely to the textbook.
<b>CLE 3251.Inq.4</b> Apply qualitative and quantitative measures to analyze data and draw conclusions that are free of bias.	<b>Student Edition:</b> See the Laboratory Manual for <i>Hole's Essentials of Human Anatomy and Physiology</i> . This manual contains 49 laboratory exercises and reports, which are integrated closely to the textbook.
<b>CLE 3251.Inq.5</b> Compare experimental evidence and conclusions with those drawn by others about the same testable question.	<b>Student Edition:</b> See the Laboratory Manual for <i>Hole's Essentials of Human Anatomy and Physiology</i> . This manual contains 49 laboratory exercises and reports, which are integrated closely to the textbook.
<b>CLE 3251.Inq.6</b> Communicate and defend scientific findings.	<b>Student Edition:</b> See the Laboratory Manual for <i>Hole's Essentials of Human Anatomy and Physiology</i> . This manual contains 49 laboratory exercises and reports, which are integrated closely to the textbook.
<b>Embedded Technology and Engineering</b>	
<p><b>Conceptual Strand</b></p> <p><i>Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.</i></p>	
<b>CLE 3251.T/E.1</b> Explore the impact of technology on social, political, and economic systems.	<b>Student Edition:</b> 76, 94, 339, 507 <i>Genetics Connection</i> 562-563 <i>Topic of Interest</i> 186, 308-309, 517, 528-529, 544, 550-551
<b>CLE 3251.T/E.2</b> Differentiate among elements of the engineering design cycle: design constraints, model building, testing, evaluating, modifying, and retesting.	<b>Student Edition:</b> See the Laboratory Manual for <i>Hole's Essentials of Human Anatomy and Physiology</i> . This manual contains 49 laboratory exercises and reports, which are integrated closely to the textbook.
<b>CLE 3251.T/E.3</b> Explain the relationship between the properties of a material and the use of the material in the application of a technology.	<b>Student Edition:</b> <i>Topic of Interest</i> 34
<b>CLE 3251.T/E.4</b> Describe the dynamic interplay among science, technology, and engineering within living, earth-space, and physical systems.	<b>Student Edition:</b> 50, 139, 339, 507 <i>Genetics Connection</i> 394-395, 562-563 <i>Topic of Interest</i> 103, 186, 196, 517, 528-529, 544

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<b>Standard 1 – Anatomical Orientation</b>	
<b>Conceptual Strand 1</b> <i>Anatomy and physiology investigates the interdependence of structure and function to form a living, integrated whole.</i>	
<b>CLE 3251.1.1</b> Distinguish between anatomy and physiology.	<b>Student Edition:</b> 3
<b>CLE 3251.1.2</b> Investigate the interrelationship between the structures and functions of the body systems.	<b>Student Edition:</b> 12-14
<b>CLE 3251.1.3</b> Investigate the body cavities, the subdivisions of each cavity, and the organs within each area.	<b>Student Edition:</b> 8-11
<b>CLE 3251.1.4</b> Use correct anatomical terminology when discussing body structures, sections, and regions.	<b>Student Edition:</b> 14-17
<b>CLE 3251.1.5</b> Describe the body mechanisms that maintain homeostasis.	<b>Student Edition:</b> 5-8, 135
<b>Standard 2 – Protection, Support, Movement</b>	
<b>Conceptual Strand 2</b> <i>The integumentary, skeletal, and muscular systems work together to support, protect, and move body structures as well as maintain homeostasis.</i>	
<b>CLE 3251.2.1</b> Identify structures of the integumentary, skeletal, and muscular systems and show the relationship between these structures and their functions.	<b>Student Edition:</b> 116-117, 117-122, 122-124, 124-125, 125-126, 130-131, 131-132, 133-135, 135-139, 139-141, 142-147, 147-151, 152, 153-154, 155-157, 157-159, 159-161, 161-169, 176-177, 177-180, 181-186, 187-189, 189-190, 190, 190-192, 193-206  <i>Genetics Connection</i> 191 <i>Organization</i> 127, 168, 207 <i>Topic of Interest</i> 121, 126, 136-137, 186, 188, 196

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<p><b>CLE 3251.2.2</b> Investigate physiological mechanisms that allow the integumentary, skeletal, and muscular systems to function.</p>	<p><b>Student Edition:</b>            116-117, 117-122, 122-124, 124-125, 125-126, 130-131, 131-132, 133-135, 135-139, 139-141, 142-147, 147-151, 152, 153-154, 155-157, 157-159, 159-161, 161-169, 176-177, 177-180, 181-186, 187-189, 189-190, 190, 190-192, 193-206  <i>Genetics Connection</i> 191  <i>Organization</i> 127, 168, 207  <i>Topic of Interest</i> 121, 126, 136-137, 186, 188, 196</p>
<p><b>Standard 3 – Integration and Regulation</b></p>	
<p><b>Conceptual Strand 3</b>  <i>The nervous and endocrine systems work in an integrative manner to maintain homeostasis and communicate with all other body systems.</i></p>	
<p><b>CLE 3251.3.1</b> Compare and contrast the anatomy and physiology of the central and peripheral nervous systems.</p>	<p><b>Student Edition:</b>            211-212, 213-214, 214-219, 219-220, 220-224, 224-225, 225-226, 227, 228-230, 230-232, 232-234, 234-242, 242-248, 248-255  <i>Organization</i> 254  <i>Topic of Interest</i> 221, 245</p>
<p><b>CLE 3251.3.2</b> Describe the structure, function, and developmental aspects of neurons and their supporting glial cells.</p>	<p><b>Student Edition:</b>            212, 213-214, 214-219, 219-220  <i>Topic of Interest</i> 221</p>
<p><b>CLE 3251.3.3</b> Investigate the physiology of electrochemical impulses and neural integration.</p>	<p><b>Student Edition:</b>            220-224, 224-225  <i>Topic of Interest</i> 221</p>
<p><b>CLE 3251.3.4</b> Investigate organs for perception of external stimuli and to the maintenance of homeostasis.</p>	<p><b>Student Edition:</b>            228-230, 248-253, 260-261, 262-265, 266-267, 267-268, 269-273, 273-276, 276-285  <i>Topic of Interest</i> 265</p>
<p><b>CLE 3251.3.5</b> Identify the major organs of the endocrine system and the associated hormonal production and regulation.</p>	<p><b>Student Edition:</b>            289-290, 290-291, 291-294, 294-295, 295-299, 299-301, 301-302, 302-304, 304-307, 307-308, 309-313  <i>Organization</i> 312  <i>Topic of Interest</i> 308-309, 310</p>

STANDARDS	PAGE REFERENCES
<b>Standard 4 – Transport</b>	
<p><b>Conceptual Strand 4</b></p> <p><i>The cardiovascular system transports materials pumped by the heart through blood vessels to all parts of the body. The lymphatic system bathes the body in extracellular fluid and works with the cardiovascular system to provide immunity and regulate fat metabolism.</i></p>	
<p><b>CLE 3251.4.1</b> Identify the molecular and cellular components of the blood and the functions of the blood.</p>	<p><b>Student Edition:</b> 317-319, 319-325, 325-327, 328-331, 331-336 <i>Genetic Connection</i> 333 <i>Topic of Interest</i> 328-329</p>
<p><b>CLE 3251.4.2</b> Explore the anatomy of the heart and describe the pathway of blood through this organ.</p>	<p><b>Student Edition:</b> 339-340, 341-346, 346-350</p>
<p><b>CLE 3251.4.3</b> Describe the biochemical and physiological nature of heart function.</p>	<p><b>Student Edition:</b> 348-352</p>
<p><b>CLE 3251.4.4</b> Describe the relationship between the structure and function of different types of blood vessels.</p>	<p><b>Student Edition:</b> 352-357 <i>Topic of Interest</i> 354</p>
<p><b>CLE 3251.4.5</b> Describe the physiological basis of circulation and blood pressure.</p>	<p><b>Student Edition:</b> 357-361 <i>Topic of Interest</i> 361</p>
<p><b>CLE 3251.4.6</b> Identify the structures of the lymphatic system.</p>	<p><b>Student Edition:</b> 376-377, 377-378, 378-379, 379-380, 380-381, 381-383, 384-385, 385-390 <i>Topic of Interest</i> 389</p>
<p><b>CLE 3251.4.7</b> Describe the details of the immune response.</p>	<p><b>Student Edition:</b> 383, 384-385, 385-390, 390-396 <i>Genetics Connection</i> 394-395 <i>Organization</i> 397 <i>Topic of Interest</i> 389</p>

STANDARDS	PAGE REFERENCES
<b>Standard 5 – Absorption and Excretion</b>	
<b>Conceptual Strand 5</b> <i>The digestive system takes in food and changes it to a usable form. The urinary system removes wastes and maintains osmotic balance.</i>	
<b>CLE 3251.5.1</b> Identify organs of the digestive and urinary systems and describe their functions.	<b>Student Edition:</b> 401-402, 402-404, 404-408, 409, 409-411, 411-414, 414-416, 416-421, 421-426, 426-429, 469-470, 470-474, 474-483, 483-486 <i>Organization</i> 439, 487 <i>Topic of Interest</i> 409, 419, 429, 484
<b>CLE 3251.5.2</b> Investigate mechanisms of digestion and food absorption.	<b>Student Edition:</b> 401-402, 402-404, 404-408, 409, 409-411, 411-414, 414-416, 416-421, 421-426, 426-429 <i>Topic of Interest</i> 438
<b>CLE 3251.5.3</b> Describe how nutrition, metabolism, and body temperature are related.	<b>Student Edition:</b> 124-125, 429-433
<b>CLE 3251.5.4</b> Explain how the kidneys function to remove wastes from the blood.	<b>Student Edition:</b> 470-471, 471-474, 474-483
<b>Standard 6 – Reproduction, Growth, and Development</b>	
<b>Conceptual Strand 6</b> <i>The reproductive system ensures the continuity of a species.</i>	
<b>CLE 3251.6.1</b> Identify the essential and accessory organs of the male and female reproductive systems and describe their functions.	<b>Student Edition:</b> 507-508, 508-515, 515-516, 516-523, 524-526, 526-527 <i>Topic of Interest</i> 513, 517
<b>CLE 3251.6.2</b> Explain hormonal regulation during a typical 28 day menstrual cycle.	<b>Student Edition:</b> 524-526
<b>CLE 3251.6.3</b> Summarize the principal events that occur during prenatal development.	<b>Student Edition:</b> 541-555 <i>Topic of Interest</i> 543, 544, 550-551