Purpose: It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

Course Title – Human Anatomy and Physiology I
Course Prefix and Number – BIOL 2401
Department - Biology Division – Math & Science
Course Type: (check one)
☐ Academic General Education Course (from ACGM – but not in WCJC Core)
☒ Academic WCJC Core Course
☐ WECM course (This course is a Special Topics or Unique Needs Course: Y☐ or N☐)

Semester Credit Hours # : Lecture hours# : Lab/other hours # 4:3:2
EQUATED PAY HOURS FOR COURSE – 4.2

Course Catalog Description – Study of the structure and function of human anatomy, including the nervous, endocrine, integumentary, muscular, and skeletal systems; as well as basic chemistry, the cell, and tissues.

Prerequisites/Corequisites - TSI satisfied in reading and writing.

Approvals – the contents of this document have been reviewed and are found to be accurate.

Prepared by Wendy Waters Date 9/14/11
Reviewed by department head Kim Raun Date 9/14/11
Accuracy verified by Division Chair Kevin Dees Date 10/10/2011
Approved by Dean of Vocational Instruction or Vice President of Instruction Leigh Ann Collins Date 12/01/11
I. **Topical Outline** – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non lecture instruction):

**Lecture**

I. **Introduction:** The body as a whole  
   A. Levels of structural organization  
   B. Homeostasis and homeostatic mechanisms  
      1. Negative feedback  
      2. Positive feedback  
   C. Description of the human body  
      1. Body regions  
      2. Body cavities  
      3. Serous membranes  

II. **Chemical level of organization**  
   A. Chemical bonds  
   B. Concept of pH and buffers  
   C. Organic molecules  
      1. Carbohydrates  
      2. Lipids  
      3. Proteins  
      4. Nucleic Acids  
         a. Components  
         b. Protein synthesis  

III. **Cellular level of organization**  
   A. The cell and its composition  
      1. Plasma membrane  
         a. Composition  
         b. Membrane permeability  
         c. Gradients  
      2. Cytoplasm  
         a. Cytosol  
         b. Organelles and their functions  
      3. Nucleus  
   B. Functional systems of the cell  
      1. Passive processes  
         a. Diffusion and facilitated diffusion  
         b. Osmosis  
      2. Active processes  
         a. Active transport  
         b. Vesicular transport  
            (i) Endocytosis  
            (ii) Exocytosis  
            (iii) Transcytosis  

IV. **Tissue level of organization (histology and function)**  
   A. Epithelial  
      1. Covering and lining  
      2. Glandular  
         a. Endocrine  
         b. Exocrine  
   B. Connective  
      1. Loose and Dense Connective Tissue  
      2. Bone
3. Cartilage  
4. Blood and lymph  
C. Muscle  
D. Nervous  
E. Epithelial and synovial membranes  
F. Tissue repair  

V. The integumentary system  
A. Epidermis  
B. Dermis  
C. Hypodermis  
D. Skin color  
E. Hair and nails  
F. Skin damage  

VI. The skeletal system  
A. Anatomy of bone  
B. Types of bones  
1. Formation  
2. Growth  
C. Types of joints  
D. Movements  
E. Homeostatic imbalances  

VII. The muscular system  
A. Types of muscle  
1. Anatomy  
2. Location  
3. Muscle physiology  

VIII. The nervous system  
A. Neuron and supporting cells  
B. Nerve physiology  
1. Action potentials  
2. Conduction  
C. Structures and function  
D. Organization  
1. Central nervous system  
   a. Major parts and their functions  
   b. Meninges  
   c. Blood-brain barrier  
   d. Cerebrospinal fluid and its circulation  
2. Peripheral nervous system  
   a. Cranial nerves and their functions  
   b. Distribution of spinal nerves  
   c. Reflex and reflex arcs  
   d. Autonomic nervous system  
E. Sensory and motor neural pathways  
F. The special senses  

IX. The endocrine system  
A. Hormone transport  
B. Mechanism of hormone action  
C. Endocrine glands  
1. Locations  
2. Structure  
3. Control of hormone secretion  
4. Function  
5. Homeostatic imbalances
Laboratory

I. Orientation
   A. Parts of a microscope
   B. Calculation of total magnification
   C. Anatomical terminology
   D. Body directions and planes
   E. Body cavities

II. Cells, tissues, and skin
   A. Identification of 4 types of tissues (models and slides)
   B. Identification of components of skin (model and slides)

III. Skeletal system
   A. Bone histology and names
   B. Bone markings

IV. Muscular system
   A. Muscle histology
   B. Names of major skeletal muscles
   C. Origin, insertion, and action of major skeletal muscles

V. Nervous system, brain and spinal cord
   A. Identification of structures of a neuron
   B. Identification of structures of brain
   C. Identification of structures of the spinal cord
   D. Identification of cranial and peripheral nerves
   E. Identification of structures of the eye and ear

VI. Endocrine system
   A. Identification of endocrine glands
   B. Hormones produced by endocrine glands

II. Course Learning Outcomes

<table>
<thead>
<tr>
<th>Course Learning Outcome</th>
<th>Method of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the basic organization of the human body and recognize the complexity of structures and functions involved in homeostasis.</td>
<td>1. lecture exam questions and post-test exam questions</td>
</tr>
<tr>
<td>2. Identify important anatomical structures of the integumentary, skeletal, muscular, nervous, and endocrine systems.</td>
<td>2. laboratory practicals</td>
</tr>
<tr>
<td>3. Compare the integumentary, skeletal, muscular, nervous, and endocrine systems with respect to: 1) overall function, 2) function of important anatomical structures of each system, 3) homeostatic mechanisms, and 4) interaction between systems.</td>
<td>3. lecture exam questions and post-test exam questions</td>
</tr>
</tbody>
</table>

III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.
IV. Suggested Course Maximum – 36 lecture; 24 lab

V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.
Laboratory classroom required

VII. Course Requirements/Grading System – Describe any course specific requirements such as
research papers or reading assignments and the generalized grading format for the course

<table>
<thead>
<tr>
<th>Grade Assignments (%)</th>
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</thead>
<tbody>
<tr>
<td>Lecture Average:</td>
<td>55%</td>
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<tr>
<td>Exam average (3-4 exams)</td>
<td>30-55%</td>
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<tr>
<td>Other (homework, quizzes, projects, etc.)</td>
<td>0-25%</td>
</tr>
<tr>
<td>Laboratory Average (average of 3 lab practicals)</td>
<td>25%</td>
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<tr>
<td>Final Exam (includes at least 50% comprehensive material)</td>
<td>20%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</tbody>
</table>

- **Academic General Education Course** (from ACGM – but not in WCJC Core)
  No additional documentation needed

- **Academic WCJC Core Course**
  Attach the Core Curriculum Checklist, including the following:
  - Basic Intellectual Competencies
  - Perspectives
  - Exemplary Educational Objectives

- **WECM Courses**
  Attach the following:
  - Program SCANS Matrix
  - Course SCANS Competencies Checklist
**Page 1: Competencies**

<table>
<thead>
<tr>
<th>Course Prefix &amp; Number: BIOL 2401</th>
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<table>
<thead>
<tr>
<th>Competency</th>
<th>Method of Assessment</th>
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<tbody>
<tr>
<td>READING: Reading at the college level means the ability to analyze and</td>
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<td>interpret a variety of printed materials – books, articles, and documents.</td>
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<td>WRITING: Competency in writing is the ability to produce clear, correct,</td>
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<tr>
<td>and coherent prose adapted to purpose, occasion, and audience.</td>
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<tr>
<td>SPEAKING: Competence in speaking is the ability to communicate orally</td>
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<tr>
<td>in clear, coherent, and persuasive language appropriate to purpose,</td>
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<td>occasion, and audience.</td>
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<tr>
<td>LISTENING: Listening at the college level means the ability to analyze</td>
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<td>and interpret various forms of spoken communication.</td>
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<tr>
<td>CRITICAL THINKING: Critical thinking embraces methods for applying both</td>
<td>Post-test question relating to regulation of homeostasis.</td>
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<td>qualitative and quantitative skills analytically and creatively to subject</td>
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<td>matter in order to evaluate arguments and to construct alternative</td>
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<td>strategies.</td>
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<td>COMPUTER LITERACY: Computer literacy at the college level means the</td>
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<td>ability to use computer-based technology in communicating, solving</td>
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<tr>
<td>problems, and acquiring information.</td>
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</table>
## Core Curriculum Checklist

### Page 2: Perspectives

Course Prefix & Number: BIOL 2401

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Method of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Establish broad and multiple perspectives of the individual in relationship to the larger society and world in which he or she lives, and help the student to understand the responsibilities of living in a culturally-and ethically-diversified world;</td>
<td>Students will successfully answer questions covering the integumentary system (examples: UV ray damage to skin, physiological consequence of burns, skin cancer).</td>
</tr>
<tr>
<td>2. Stimulate a capacity to discuss and reflect upon individual, political, economic, and social aspects of life to understand ways to be a responsible member of society;</td>
<td>Students will successfully complete a lab exercise on the microscope. Students will be expected to find and identify squamous cells from a buccal scraping.</td>
</tr>
<tr>
<td>3. Recognize the importance of maintaining health and wellness;</td>
<td>Students will successfully answer lecture test questions involving the use of stem cells (examples: in vitro cell culture for transplantation use in spinal cord injury).</td>
</tr>
<tr>
<td>4. Develop a capacity to use knowledge of how technology and science affect lives;</td>
<td>Students will successfully answer test questions that integrate anatomy and physiology with biochemistry or physics (examples: drug action, neurotransmitter action, levers).</td>
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<tr>
<td>5. Develop personal values for ethical behavior;</td>
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<td>6. Develop the ability to make aesthetic judgments;</td>
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<td>7. Use logical reasoning in problem solving;</td>
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<tr>
<td>8. Integrate knowledge and understanding of the interrelationships of the scholarly disciplines</td>
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</table>

Administrative-Master Syllabus
revised September 2011
Course Prefix & Number: BIOL 2401

<table>
<thead>
<tr>
<th>Exemplary Educational Objective</th>
<th>Method of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understand and apply method and appropriate technology to the study of natural science.</td>
<td>Skill on laboratory practical: demonstrate ability to use microscope to identify different types of tissues, glands, or organs.</td>
</tr>
<tr>
<td>2. Recognize scientific and quantitative methods and the difference between these approaches and other methods of inquiry; and communicate findings, analyses, and interpretations both orally and in writing.</td>
<td>Post-test question covering interpretation of positive and/or negative feedback systems</td>
</tr>
<tr>
<td>3. Identify and recognize the differences among competing scientific theories.</td>
<td>Lecture exam questions covering theories explaining physiological principles.</td>
</tr>
<tr>
<td>4. Demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies.</td>
<td>Lecture exam question covering stem cells (examples may include gene therapy and cloning).</td>
</tr>
<tr>
<td>5. Demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.</td>
<td>Lecture exam question pertaining to medical procedures that enhance the quality of life (examples: plastic surgery, liposuction, Botox, Lasik, and cochlear implants).</td>
</tr>
</tbody>
</table>