Cover Letter for Proposed Changes to the Human Anatomy and Physiology Curriculum in the Department of Biology

Description: We are deactivating BIOL201/201L (Human Physiology) and BIOL202/202L (Human Anatomy) and creating two new courses BIOL221/221L (Human Anatomy and Physiology 1) and BIOL222/222L (Human Anatomy and Physiology 2). The rationale behind this change is that it will enhance the delivery of course content by allowing us to build a better conceptual connection between human anatomy and physiology for each body system.

Note: Memorandums (items 8-10) outline how these new courses will replace the old courses within each affected major and/or when these courses serve as prerequisites. One exception is for the major in Data Science with Exercise Physiology Cognate. Here we decided to add the entire sequence to the cognate to ensure that students had a complete understanding of human physiology. As such, we have generated a Change of Major.

List of Documents:
1) Signature Form
2) New Course Form BIOL221/221L
3) Syllabi for BIOL221 and BIOL221L
4) New Course Form BIOL222/222L
5) Syllabi for BIOL222 and BIOL222L
6) Deactivate Course Form BIOL201/201L
7) Deactivate Course Form BIOL202/202L
8) Memorandum from Michael Flynn, Chair of the Department of Health and Human Performance
9) Memorandum from Paul Anderson, Director of the Data Science Program
10) Memorandum from Willem Hillenius, Chair of the Department of Biology
11) Change of Major Form Data Science with Exercise Physiology Cognate
12) Revised Program of Study worksheet for Data Science with Exercise Physiology Cognate
13) Memorandum from Registrar's Office
FACULTY CURRICULUM COMMITTEE
SIGNATURE PAGE

- In section A, list ALL of the forms covered by this signature page. If you submit a form that is not listed in A, your proposal will be held back until we receive a new, updated signature page.
- You must obtain the signature of your department chair and dean before submitting your proposal.

A. FORMS COVERED BY THIS SIGNATURE PAGE. List each form you are submitting—for instance, PSYC 383, Course Form; PSYC, Change of Major Form; PSYC, Change of Minor Form.

BIOL221/221L, BIOL 222/222L, BIOL201/201L, BIOL202/202L Course Forms
BIOL221/221L, BIOL222/222L, Syllabi
MEMORANDUMS: Michael Flynn, Paul Anderson, Jaap Hillenius, Registrar's Office.
Data Science: Change of Major Form
Data Science: Revised Program of Study From

B. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:
   
   [Signature]
   Date: 08/06/14

2. Signature of Academic Dean:
   
   [Signature]
   Date: 2/19/14

3. Signature of Provost:
   
   [Signature]
   Date: 2/27/14

4. Signature of Business Affairs (only for course fees):
   
   [Signature]
   Date: ________
   □ fee approved on ________
   □ BOT approval pending

5. Signature of Curriculum Committee Chair:
   
   [Signature]
   Date: __________

6. Signature of Budget Committee Chair (only for new programs):
   
   [Signature]
   Date: __________

7. Signature of Academic Planning Committee Chair (only for new programs):
   
   [Signature]
   Date: __________

8. Signature of Faculty Senate Secretary:
   
   [Signature]
   Date: __________

Date Approved by Faculty Senate: __________
FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
• Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
• Fill out the parts of the form specified in part B. You must do this before your request can move forward!
• Remember that your changes will not be implemented until the next catalog year at the earliest.
• If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Eric McElroy 
Phone: 843-953-3707  
Email: mcelroye@cofc.edu

Department or Program: Biology  
School: Science and Mathematics

Subject Acronym and Course Number: BIOL221/221L

Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☐ Add a New Course (complete parts C, D, F, G, H, I, J, K)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J, K)
☐ Course Number
☐ Course Name
☐ Course Description
☐ Credit/Contact Hours
☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☐ Deactivate an Existing Course (complete parts C, D, E, G, I, J, K)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J, K)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

The non-majors human anatomy and physiology curriculum (currently BIOL201 and 202) is being changed. Currently these two courses are offered separately, BIOL201 is Human Physiology and BIOL202 is Human Anatomy. This is pedagogically disadvantageous because students must learn the anatomy of each body system in complete isolation from that system’s physiology. Obviously the function of the human body is intimately related to its anatomy. Given this issue, we propose to convert the anatomy and physiology curriculum into a yearlong sequence. Human Anatomy and Physiology 1 (BIOL221) and Human Anatomy and Physiology 2 (BIOL222) will replace BIOL201 and BIOL202. By making this change we can more thoroughly integrate anatomy and physiology for each body system, helping students to better see the relationship between the two.

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Students in all programs should have a better understanding of human anatomy and physiology as a result of this change, which will enhance their progression through each degree program.
The Department of Health and Human Performance, the Department of Biology and the Data Science Major within the Department of Computer Science use these courses in their programs as requirements to complete the major and/or as prerequisites for upper division courses. Please see attached letters outlining how the new courses will integrate into their curriculum.

E. **EXISTING COURSE INFORMATION.** If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

<table>
<thead>
<tr>
<th>Department:</th>
<th>School:</th>
<th>Subject Acronym:</th>
<th>Course Number:</th>
</tr>
</thead>
</table>

Credit hours:  ___ lecture  ___ lab  ___ seminar  ___ independent study

Contact hours:  ___ lecture  ___ lab  ___ seminar  ___ independent study

Course title:

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

Cross-listing, if any:

Is this course repeatable?  [ ] yes  [ ] no  If yes, how many total credit hours may the student earn?  

F. **NEW COURSE INFORMATION.** If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use **boldface** for the information that is changing.

<table>
<thead>
<tr>
<th>Department: Biology</th>
<th>School: SSM</th>
<th>Subject Acronym: BIOL</th>
<th>Course Number: 221/221L</th>
</tr>
</thead>
</table>

Credit hours:  3 lecture  1 lab  ___ seminar  ___ independent study

Contact hours:  3 lecture  3 lab  ___ seminar  ___ independent study

Course title: Human Anatomy and Physiology 1

Course description (maximum 50 words, exactly as it appears in the catalog):

An introduction to the gross morphology, microscopic anatomy, structure and function of the nervous, muscular, skeletal, and cardiac systems of the human body. Lectures three hours per week; laboratory three hours per week. This course is intended for pre-allied health, physical education, and pre-nursing majors.

Restrictions (pre-requisites, co-requisites, majors only, etc.):

BIOL111/111L, BIOL112/112L

If this is a newly-created course, is it intended to be the equivalent of an existing course and replace it?  [x] yes  [ ] no

If so, which course? BIOL 202

Note: You must deactivate that course by submitting an additional Course Form.

Cross-listing, if any (submit approval from relevant department):

Note: Cross-listed courses are equivalent.

Is this course repeatable?  [ ] yes  [x] no  If yes, how many total credit hours may the student earn?  

Is there an activity, lab, or other fee associated with this course?  [x] yes  [ ] no  What is the fee? Standard biology laboratory fee.

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This form was last updated on 06/03/13 and replaces all others.

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Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

G. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.
None.

H. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Identify and use the basic vocabulary of human anatomy and physiology</td>
<td>In-class Examinations (both lecture and laboratory). Students will be assessed several times throughout the semester and at the end of the semester. Students should be able to demonstrate mastery of 60% of the vocabulary to achieve a passing grade. More than 80% of students enrolled in the course should achieve this metric.</td>
</tr>
<tr>
<td>2. Describe the relationship between structure and function for each human body system and relate it to some human diseases</td>
<td>In-class Examinations (both lecture and laboratory). Students will be assessed several times throughout the semester and at the end of the semester. Students should be able to demonstrate mastery of 60% of the structure-function relationships to achieve a passing grade. More than 80% of students enrolled in the course should achieve this metric.</td>
</tr>
<tr>
<td>3. Demonstrate an understanding of the scientific method and experimental design</td>
<td>Two routes: 1) Written and oral reports of student-designed, group-based laboratory experiments and 2) In-class Examinations. For 1) Students will be assessed at least twice during the semester, once in the middle and once at the end. For 2) students will be assessed several times throughout and at the end of the semester. Students should be able to generate a research question/hypothesis based on an understanding of basic human anatomy/physiology and then design, execute and interpret an experiment to test that hypothesis. A minimum passing grade is earned by meeting the previous statement above with higher grades reflecting more complex and complete thinking regarding scientific methodology and experimentation. More than 80% of students enrolled in the course should achieve this metric.</td>
</tr>
<tr>
<td>4. Continue to develop written, oral, group-work and computational skill sets</td>
<td>Two routes: 1) Group-based written and oral reports of student-designed laboratory experiments and 2) In-class Examinations. For 1) Students will be assessed at least twice during the semester, once in the middle and once at the end. For 2) students will be assessed</td>
</tr>
</tbody>
</table>
several times throughout and at the end of the semester. Students should be able to effectively communicate scientific findings in both oral and written formats using appropriate terminology and interpretation of anatomy/physiology. Students should be able to use computational skills to assess the function of the human body and statistically evaluate experimental data. A minimum passing grade is earned by meeting the previous statement above with higher grades reflecting more refined, skillful, and creative writing/presentation/quantitative skills. More than 80% of students enrolled in the course should achieve this metric.

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

The course aligns with the following learning outcomes per each of the following programs/majors, etc. (justification of alignment is indicated by an →)

**GENERAL EDUCATION**

1. Acquire basic knowledge of the arts, humanities, mathematics, and the natural and social sciences, the languages which define and convey this knowledge, and the relationship among the branches of knowledge.
   → See student learning outcomes 1 and 2 above. Introduced and reinforced from BIOL111 and BIOL112
2. Develop effective reading, writing, and oral communication skills in English, and basic communication skills in a language other than English.
   → See student learning outcome 4 above. Reinforced from BIOL111 and BIOL112
3. Develop skills in the methods and technologies of inquiry, critical thinking, problem solving, scientific research, quantitative and historical analysis.
   → See student learning outcome 3 above. Reinforced from BIOL111 and BIOL112
4. Employ the available resources to retrieve, use and evaluate information from a variety of sources.
   → See student learning outcome 3 above. Part of experimental design involves finding, evaluating and citing relevant primary scientific literature. Reinforced from BIOL111 and BIOL112
5. Develop the ability to set and achieve personal goals.
   → Many students struggle with this course and as such must set a goal for the grade they expect and arrange their study habits/work ethic around that goal. Students are routinely advised about this during instructor office hours. Reinforced from BIOL111 and BIOL112
6. Work and interact effectively with others.
   → Laboratory involved group based experiments and communication. Reinforced from BIOL111 and BIOL112 (learning outcome #4 above)
7. Develop intellectual honesty and curiosity, a commitment to lifelong learning, a sense of personal responsibility, and informed, active, responsible citizenship in a climate of civility where dialogue about intellectual debates and controversies can occur.
   → Student-driven laboratory experiments are conceived and executed entirely by the students, which fosters creatively, curiosity and makes them face ethical issues with data collection, analysis, and presentation. Reinforced from BIOL111 and BIOL112

**BIOLOGY (B.A.)**

1. Structure and function - Basic units of structure define the function of all living things. → BIOL221, at its core, is the...
study of the structure and function of the human body. Introduced and Reinforced from BIOL111 and BIOL112. This align with student learning outcomes 1 and 2 above.

2. Ability to use quantitative reasoning- Biology relies on applications of quantitative analysis and mathematical reasoning. This aligns with student learning outcome 4. Reinforce BIOL111/112.

3. Ability to apply the process of science- Biology is evidence based and grounded in the formal practices of observation, experimentation, and hypothesis testing. This aligns with student learning outcome 3. Reinforce BIOL111/112.

Athletic Training Major (B.S.)
Physical Education Major (B.S.)
Exercise Science Major (B.S.)
Public Health Major (B.A.)
These four majors are all within the Department of Health and Human Performance. The primary mission of this department is to provide academic preparation for students in these majors. Human Anatomy and Physiology 1 is used as prereq for several classes within these majors and is a core course of these majors. As such, Human Anatomy and Physiology 1&2 provides a key facet of the academic preparation of these students.

Data Science with Biomechanics Cognate (B.S.)
Data Science with Exercise Physiology Cognate (B.S.)
These two majors fall within the Department of Computer Science which has the following goals that are relevant to BIOL221.

1) To develop strong major programs that combine a sound theoretical and practical foundation with breadth and depth in the discipline.

BIOL221 provide breadth to the field of Data Science by allowing students to connect the specifics of their major to applied fields.

2) To serve the needs and interests of a broad spectrum of students, especially non-majors, who see the use of computers as important in their personal or professional development.

BIOL221 with these two cognates meet the needs and interests of students wishing to combine data science with anatomical/physiological knowledge.

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration? ☒ yes ☐ no SEE ATTACHED LETTER FROM REGISTRAR

But see attached letter about how these new courses articulate with programs that currently use BIOL201 and BIOL202.

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.
J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☐ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
Syllabus

Biology 221: Human Anatomy and Physiology 1

Lecture

Instructor:

Office Hours:

Required Texts for Lecture:
1. Marieb and Hoehn, Anatomy and Physiology
3. 100 Case Studies in Pathophysiology by Harold J Bruere

Learning Outcomes for Lecture:
1. Identify and use the basic vocabulary of human anatomy and physiology
2. Reiterate the relationship between structure and function for each human body system and relate it to some human diseases
3. Demonstrate an understanding of the scientific method and experimental design
4. Continue to develop written, oral, group-work and computational skill sets

Assessment for Lecture:
1. Examinations: There will be 3 regular exams and 1 final exam.
   a. Regular exams will cover the lecture and laboratory material PRIOR to the exam.
   b. Final exam is comprehensive and open book/notes. It will include any/all material from the topic list.
   c. They will be given on the dates in the schedule below and last EXACTLY 50 minutes.
   d. Format: Multiple choice, matching or short answer.
   e. Purpose is to test your knowledge and ability regarding the material covered in lecture & laboratory.
2. Case Study Assignments: There will be 3 assignments from the Case Studies Book.
   a. A substantial portion (5-10 questions) of each exam will involve the case study.
   b. You will work with a group to complete the case study based on the questions in the case study book.
   c. Case Studies will be assigned during the semester.

Points Distribution for Lecture:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>150 pts</td>
</tr>
<tr>
<td>Exam 2</td>
<td>150 pts</td>
</tr>
<tr>
<td>Exam 3</td>
<td>150 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>150 pts</td>
</tr>
</tbody>
</table>

Lecture is worth 75% of final grade, Laboratory is worth 25%. Your lab instructor will provide a syllabus for the laboratory and outline assignments for lab.

Grading Scale:

SNAP students: Please notify me ASAP. The SNAP office will provide a testing space and oversee your examination.

Academic Honesty: The following website is the official policy on cheating:
http://policy.cofc.edu/documents/12.4.1.pdf You should read this and be sure you understand what cheating is and what the college-level penalties may be! I will involve the honor board if needed.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Exams &amp; Case Studies</th>
<th>Chapters in Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intro/Tissue Types/Cell Types</td>
<td></td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>2</td>
<td>Nervous System</td>
<td></td>
<td>11, 12, 13, 14</td>
</tr>
<tr>
<td>3</td>
<td>Nervous System</td>
<td></td>
<td>11, 12, 13, 14</td>
</tr>
<tr>
<td>4</td>
<td>Nervous System</td>
<td>Case Study A</td>
<td>11, 12, 13, 14</td>
</tr>
<tr>
<td>5</td>
<td>Nervous System</td>
<td>Exam 1</td>
<td>11, 12, 13, 14</td>
</tr>
<tr>
<td>6</td>
<td>Skeletal System</td>
<td></td>
<td>6, 7, 8</td>
</tr>
<tr>
<td>7</td>
<td>Skeletal System</td>
<td></td>
<td>6, 7, 8</td>
</tr>
<tr>
<td>8</td>
<td>Muscular System</td>
<td>Case Study B</td>
<td>9, 10</td>
</tr>
<tr>
<td>9</td>
<td>Muscular System</td>
<td></td>
<td>9, 10</td>
</tr>
<tr>
<td>10</td>
<td>Muscular System</td>
<td>Exam 2</td>
<td>9, 10</td>
</tr>
<tr>
<td>11</td>
<td>Muscular System</td>
<td></td>
<td>9, 10</td>
</tr>
<tr>
<td>12</td>
<td>Cardiac</td>
<td>Case Study C</td>
<td>17</td>
</tr>
<tr>
<td>13</td>
<td>Cardiac</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>14</td>
<td>Cardiac</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>15</td>
<td>Cardiac</td>
<td>Exam 3</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Exam</td>
<td></td>
</tr>
</tbody>
</table>
TOPIC LIST FOR BIOL221:

Use this list, coupled with lecture material, to identify important material for exams. If we do not cover it is STILL fair game for exams, so you should look up the material in your book. Material identified by "(BACKGROUND...FROM INTRO BIOL)" will not be specifically tested, but I do expect you to remember it from introductory biology (BIOL111, 112). Before each exam I will annotate this list to help guide you regarding the topics covered on the exam. You will be provided with a detail list in laboratory of the anatomical structures you are expected to learn.

ENZYMES AND METABOLISM
A. Enzyme Structure and Function (BACKGROUND...FROM INTRO BIOL)
   1. Function of enzymes in catalyzing biological reactions
   2. Reduction of activation energy
   3. Substrates and enzyme specificity

B. Basic Metabolism
   1. Glycolysis (anaerobic and aerobic, substrates and products)
   2. Krebs cycle (substrates and products, general features of the pathway)
   3. Electron transport chain and oxidative phosphorylation (substrates and products, general features of the pathway)
   4. Metabolism of fats and proteins

GENERALIZED EUKARYOTIC CELL
A. Membrane-bound Organelles (BACKGROUND...FROM INTRO BIOL)
   1. Mitochondria
      a. site of ATP production
      b. self-replication; have own DNA and ribosomes
      c. inner and outer membrane
   2. Lysosomes (vesicles containing hydrolytic enzymes)
   3. Endoplasmic reticulum
      a. rough (RER) and smooth (SER)
      b. RER (site of ribosomes)
      c. role in membrane biosynthesis: SER (lipids), RER (transmembrane proteins)
      d. RER (role in biosynthesis of transmembrane and secreted proteins that cotranslationally targeted to RER by signal sequence)
   4. Golgi apparatus (general structure; role in packaging, secretion, and modification of glycoprotein carbohydrates)

B. Plasma Membrane
   1. General function in cell containment
   2. Protein and lipid components, fluid mosaic model
   3. Osmosis
   4. Passive and active transport
   5. Membrane channels
   6. Sodium–potassium pump
   7. Membrane receptors, cell signaling pathways, second messengers
   8. Membrane potential
   9. Exocytosis and endocytosis
   10. Cell–cell communication (general concepts of cellular adhesion)
      a. gap junctions
      b. tight junctions
      c. desmosomes

SPECIALIZED EUKARYOTIC CELLS AND TISSUES
A. Nerve Cell/Neural
   1. Cell body (site of nucleus and organelles)
   2. Axon (structure, function)
3. Dendrites (structure, function)
4. Myelin sheath, Schwann cells, oligodendrocytes, insulation of axon
5. Nodes of Ranvier (role in propagation of nerve impulse along axon)
6. Synapse (site of impulse propagation between cells)
7. Synaptic activity
   a. transmitter molecules
   b. synaptic knobs
   c. fatigue
   d. propagation between cells without resistance loss
8. Resting potential (electrochemical gradient)
9. Action potential
   a. threshold, all-or-none
   b. sodium–potassium pump
10. Excitatory and inhibitory nerve fibers (summation, frequency of firing)

B. Muscle Cell/Contractile
1. Energy sources for muscle contraction (ATP sources)
2. Organization of contractile elements (actin and myosin filaments, cross bridges, sliding filament model)
3. Calcium regulation of contraction, sarcoplasmic reticulum
4. Sarcomere – Band, Lines, Zones
5. Presence and function of troponin and tropomyosin
6. Mechanisms of muscular fatigue

C. Other Specialized Cell Types
1. Epithelial cells (cell types, simple epithelium, stratified epithelium)
2. Endothelial cells
3. Connective tissue cells (major tissues and cell types, fiber types, loose versus dense, extracellular matrix)

NERVOUS SYSTEM

A. Nervous System: Structure and Function
1. Major functions
   a. high-level control and integration of body systems
   b. response to external influences
   c. sensory input
   d. integrative and cognitive abilities
2. Organization of vertebrate nervous system
3. Sensor and effector neurons
4. Sympathetic and parasympathetic nervous systems (functions, antagonistic control)
5. Reflexes
   a. feedback loop, reflex arc, effects on flexor and extensor muscles
   b. roles of spinal cord, brain
   c. efferent control

B. Nervous System: Sensory Reception and Processing
1. Skin, proprioceptive and somatic sensors
2. Olfaction, taste
3. Hearing
   a. ear structure
   b. mechanism of hearing
4. Vision
   a. light receptors
   b. eye structure
   c. visual image processing
CIRCULATORY, LYMPHATIC, AND IMMUNE SYSTEMS

A. Circulatory System
1. Functions (circulation of oxygen, nutrients, hormones, ions, and fluids; removal of metabolic waste)
2. Role in thermoregulation
3. Four-chambered heart (structure, function), Cardiac Cycle, Pressure-Volume diagrams
4. Systolic and diastolic pressure
5. Pulmonary and systemic circulation

MUSCLE AND SKELETAL SYSTEMS

A. Muscle System
1. Functions
   a. support, mobility
   b. peripheral circulatory assistance
   c. thermoregulation (shivering reflex)
2. Structural characteristics of skeletal, smooth, and cardiac muscle; striated versus nonstriated
3. Nervous control
   a. motor neurons
   b. neuromuscular junctions, motor end plates
   c. voluntary and involuntary muscles
   d. sympathetic and parasympathetic innervation
4. Muscle fiber types
5. Lever systems, biomechanics of muscle-skeleton integration

B. Skeletal System
1. Functions
   a. structural rigidity and support
   b. calcium storage
   c. physical protection
2. Skeletal structure
   a. specialization of bone types; structures
   b. joint structures
   c. endoskeleton versus exoskeleton
3. Cartilage (structure, function)
4. Ligaments, tendons
5. Bone structure
   a. calcium–protein matrix
   b. bone growth (osteoblasts, osteoclasts)
Syllabus

Instructor:
Office Hours:

Required Texts:
1. Lab Manual from SAS-E INK, this manual outlines the physiology laboratory exercises and provides a list of anatomical structures for each body system. We will use this during both Semesters (BIOL221 and BIOL222)

Learning Outcomes:
1. Identify and use the basic vocabulary of human anatomy and physiology
2. Reiterate the relationship between structure and function for each human body system and relate it to some human diseases
3. Demonstrate an understanding of the scientific method and experimental design
4. Continue to develop written, oral, group-work and computational skill sets

Assessment:
1. Written Laboratory Reports: There will be 2 mini-reports and 1 final project report.
   a. Details can be found in the laboratory manual.
2. Oral Laboratory Presentations: There will be 1 mini-project presentation and 1 final project presentation
   a. Details can be found in the laboratory manual.
3. Participation: You are expected to be present, on-time to each laboratory. You are also expected to be more than a lump on a lab stool...that means I should see you interacting with your group, actively performing the activities, and asking questions. It's not hard to earn these points....attend lab and engage in what we are doing. This also means I should not see you checking facebook, email, espn, you tube etc. on your phones/pads/computers.

Points Distribution:

<table>
<thead>
<tr>
<th>Points Distribution</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-reports</td>
<td>40 pts</td>
</tr>
<tr>
<td>Final Report</td>
<td>60 pts</td>
</tr>
<tr>
<td>Mini Presentation</td>
<td>20 pts</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>60 pts</td>
</tr>
<tr>
<td>Participation Points</td>
<td>20 pts</td>
</tr>
</tbody>
</table>

Total 200 PTS (25% of overall grade in BIOL221)

Attendance: Miss one unexcused lab: lose half of participation points (10 points). Miss two labs (excused or unexcused): lose all of participation points (20 pts). Miss three labs (excused or unexcused): lose all of lab points (200 pts).

Academic Honesty: If I suspect you are cheating I will give you a 0 on the assignment and/or report you to the Dean of Students for an Honor Board hearing.

Schedule: SEE NEXT PAGE

Safety: SSM/Biology Safety Policy will be distributed and followed.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tissue Types, Anatomical Naming Conventions</td>
</tr>
<tr>
<td>2</td>
<td>Neuroanatomy</td>
</tr>
<tr>
<td>3</td>
<td>Sensory Systems</td>
</tr>
<tr>
<td>4</td>
<td>Mini Project 1</td>
</tr>
<tr>
<td>5</td>
<td>Skeletal Anatomy</td>
</tr>
<tr>
<td>6</td>
<td>Skeletal Anatomy</td>
</tr>
<tr>
<td>7</td>
<td>Muscle Anatomy</td>
</tr>
<tr>
<td>8</td>
<td>Muscle Anatomy</td>
</tr>
<tr>
<td>9</td>
<td>Muscle Physiology</td>
</tr>
<tr>
<td>10</td>
<td>Mini Project 2</td>
</tr>
<tr>
<td>11</td>
<td>Mini Project Presentation</td>
</tr>
<tr>
<td>12</td>
<td>Heart Anatomy and Physiology (EKG)</td>
</tr>
<tr>
<td>13</td>
<td>Final Group Project</td>
</tr>
<tr>
<td>14</td>
<td>Final Group Project</td>
</tr>
<tr>
<td>15</td>
<td>Final Group Presentation</td>
</tr>
</tbody>
</table>
FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
• Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
• Fill out the parts of the form specified in part B. You must do this before your request can move forward!
• Remember that your changes will not be implemented until the next catalog year at the earliest.
• If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Eric McElroy            Phone: 843-953-3707            Email: mcelroye@cofc.edu
Department or Program: Biology           School: Science and Mathematics
Subject Acronym and Course Number: BIOL222/222L
Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☑ Add a New Course (complete parts C, D, F, G, H, I, J, K)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J, K)
☐ Course Number
☐ Course Name
☐ Course Description
☐ Credit/Contact Hours
☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☐ Deactivate an Existing Course (complete parts C, D, E, G, I, J, K)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J, K)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

The non-majors human anatomy and physiology curriculum (currently BIOL201 and 202) is being changed. Currently these two courses are offered separately, BIOL201 is Human Physiology and BIOL202 is Human Anatomy. This is pedagogically disadvantageous because students must learn the anatomy of each body system in complete isolation from that system’s physiology. Obviously the function of the human body is intimately related to its anatomy. Given this issue, we propose to convert the anatomy and physiology curriculum into a year-long sequence. Human Anatomy and Physiology 1 (BIOL221) and Human Anatomy and Physiology 2 (BIOL222) will replace BIOL201 and BIOL202. By making this change we can more thoroughly integrate anatomy and physiology for each body system, helping students to better see the relationship between the two.

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Students in all programs should have a better understanding of human anatomy and physiology as a result of this change, which will enhance their progression through each degree program.

This form was last updated on 06/03/13 and replaces all others.
The Department of Health and Human Performance, the Department of Biology and the Data Science Major within the Department of Computer Science use these courses in their programs as requirements to complete the major and/or as prerequisites for upper division courses. Please see attached letters outlining how the new courses will integrate into their curriculum.

E. EXISTING COURSE INFORMATION. If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: ___________ School: ___________ Subject Acronym: ___________ Course Number: ___________

Credit hours: ___ lecture ___ lab ___ seminar ___ independent study
Contact hours: ___ lecture ___ lab ___ seminar ___ independent study

Course title:

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

Cross-listing, if any:

Is this course repeatable? ☐ yes ☐ no If yes, how many total credit hours may the student earn? ___

F. NEW COURSE INFORMATION. If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use boldface for the information that is changing.

Department: Biology School: SSM Subject Acronym: BIOL Course Number: 222/222L

Credit hours: 3 lecture 1 lab ___ seminar ___ independent study
Contact hours: 3 lecture 3 lab ___ seminar ___ independent study

Course title: Human Anatomy and Physiology 2

Course description (maximum 50 words, exactly as it appears in the catalog):
An introduction to the gross morphology, microscopic anatomy, structure and function of the vascular, respiratory, renal, digestive, immune, endocrine, and reproductive systems of the human body. Lectures three hours per week; laboratory three hours per week. This course is intended for pre-allied health, physical education, and pre-nursing majors.

Restrictions (pre-requisites, co-requisites, majors only, etc.):
PREREQ: BIOL221

If this is a newly-created course, is it intended to be the equivalent of an existing course and replace it? ☒ yes ☐ no
If so, which course? BIOL201
Note: You must deactivate that course by submitting an additional Course Form.

Cross-listing, if any (submit approval from relevant department):
Note: Cross-listed courses are equivalent.

Is this course repeatable? ☐ yes ☒ no If yes, how many total credit hours may the student earn? ___
Is there an activity, lab, or other fee associated with this course?  ☒ yes  ☐ no  What is the fee? Standard Biology Lab Fee

Note: The Senate cannot approve new fees. Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

G. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

None.

H. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
</tbody>
</table>

| 1. Identify and use the basic vocabulary of human anatomy and physiology | In-class Examinations (both lecture and laboratory). Students will be assessed several times throughout the semester and at the end of the semester. Students should be able to demonstrate mastery of 60% of the vocabulary to achieve a passing grade. More than 80% of students enrolled in the course should achieve this metric. |
| 2. Reiterate the relationship between structure and function for each human body system and relate it to some human diseases | In-class Examinations (both lecture and laboratory). Students will be assessed several times throughout the semester and at the end of the semester. Students should be able to demonstrate mastery of 60% of the structure-function relationships to achieve a passing grade. More than 80% of students enrolled in the course should achieve this metric. |
| 3. Demonstrate an understanding of the scientific method and experimental design | Two routes: 1) Written and oral reports of student-designed group-based laboratory experiments and 2) In-class Examinations. For 1) Students will be assessed at least twice during the semester, once in the middle and once at the end. For 2) students will be assessed several times throughout and at the end of the semester. Students should be able to generate a research question/hypothesis based on an understanding of basic human anatomy/physiology and then design, execute and interpret an experiment to test that hypothesis. A minimum passing grade is earned by meeting the previous statement above with higher grades reflecting more complex and complete thinking regarding scientific methodology and experimentation. More than 80% of students enrolled in the course should achieve this metric. |
| 4. Continue to develop written, oral, group-work and computational skill sets | Two routes: 1) Group based-written and oral reports of student-designed laboratory experiments and 2) In- |
How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

The course aligns with the following learning outcomes per each of the following programs/majors, etc. (justification of alignment is indicated by an ◀️)

GENERAL EDUCATION
1. Acquire basic knowledge of the arts, humanities, mathematics, and the natural and social sciences, the languages which define and convey this knowledge, and the relationship among the branches of knowledge.
   ◀️ See student learning outcomes 1 and 2 above. Introduced and reinforced from BIOL111, BIOL112 and BIOL221
2. Develop effective reading, writing, and oral communication skills in English, and basic communication skills in a language other than English
   ◀️ See student learning outcome 4 above. Reinforced from BIOL111, BIOL112 and BIOL221.
3. Develop skills in the methods and technologies of inquiry, critical thinking, problem solving, scientific research, quantitative and historical analysis
   ◀️ See student learning outcome 3 above. Reinforced from BIOL111, BIOL112 and BIOL221.
4. Employ the available resources to retrieve, use and evaluate information from a variety of sources
   ◀️ See student learning outcome 3 above. Part of experimental design involves finding, evaluating and citing relevant primary scientific literature. Reinforced from BIOL111, BIOL112 and BIOL221.
5. Develop the ability to set and achieve personal goals
   ◀️ Many students struggle with this course and as such must set a goal for the grade they expect and arrange their study habits/work ethic around that goal. Students are routinely advised about this during instructor office hours. Reinforced from BIOL111, BIOL112 and BIOL221.
6. Work and interact effectively with others
   ◀️ Laboratory involved group based experiments and communication. Reinforced from BIOL111, BIOL112 and BIOL221.
7. Develop intellectual honesty and curiosity, a commitment to lifelong learning, a sense of personal responsibility, and informed, active, responsible citizenship in a climate of civility where dialogue about intellectual debates and controversies can occur.
   ◀️ Student-driven laboratory experiments are conceived and executed entirely by the students, which fosters creatively, curiosity and makes them face ethical issues with data collection, analysis, and presentation. Reinforced from BIOL111, BIOL112 and BIOL221.
BIOLOGY (B.A.)
1. Structure and function - Basic units of structure define the function of all living things. → BIOL222, at its core, is the study of the structure and function of the human body. Introduced and Reinforced from BIOL111, BIOL112, BIOL221. This aligns with student learning outcomes 1 and 2 above.
2. Ability to use quantitative reasoning - Biology relies on applications of quantitative analysis and mathematical reasoning. → This aligns with student learning outcome 4.
3. Ability to apply the process of science - Biology is evidence based and grounded in the formal practices of observation, experimentation, and hypothesis testing. → This aligns with student learning outcome 3.

Athletic Training Major (B.S.)
Physical Education Major (B.S.)
Exercise Science Major (B.S.)
Public Health Major (B.A.)
→ These four majors are all within the Department of Health and Human Performance. The primary mission of this department is to provide academic preparation for students in these majors. Human Anatomy and Physiology 1&2 is used as prerequisite for several classes within these majors and is a core course of these majors. As such, Human Anatomy and Physiology 1&2 provides a key facet of the academic preparation of these students.

Data Science with Biomechanics Cognate (B.S.)
Data Science with Exercise Physiology Cognate (B.S.)
→ These two majors fall within the Department of Computer Science which has the following goals that are relevant to BIOL221 and BIOL222.
1) To develop strong major programs that combine a sound theoretical and practical foundation with breadth and depth in the discipline.
   → BIOL221 and BIOL222 provide breadth to the field of Computer Science by allowing students to connect the specifics of their major to applied fields.
2) To serve the needs and interests of a broad spectrum of students, especially non-majors, who see the use of computers as important in their personal or professional development.
   → BIOL221 and BIOL222 with these two cognates meet the needs and interests of students wishing to combine data science with anatomical/physiological knowledge.

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration?  □ yes  X no  SEE LETTER FROM Registrar

But see attached letter about how these new courses articulate with programs that currently use BIOL201 and BIOL202.

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.

This form was last updated on 06/03/13 and replaces all others.
J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☐ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
Syllabus  Biology 222: Human Anatomy and Physiology 2

Lecture

Instructor:

Office Hours:

Required Texts for Lecture:
1. Marieb and Hoehn, Anatomy and Physiology
2. Clemente, Anatomy: A regional atlas of the human body
3. 100 Case Studies in Pathophysiology by Harold J Bruyere

Learning Outcomes for Lecture:
1. Identify and use the basic vocabulary of human anatomy and physiology
2. Reiterate the relationship between structure and function for each human body system and relate it to some human diseases
3. Demonstrate an understanding of the scientific method and experimental design
4. Continue to develop written, oral, group-work and computational skill sets

Assessment for Lecture:
1. Examinations: There will be 3 regular exams and 1 final exam.
   a. Regular exams will cover the lecture and laboratory material PRIOR to the exam.
   b. Final exam is comprehensive and open book/notes. It will include any/all material from the topic list.
   c. They will be given on the dates in the schedule below and last EXACTLY 50 minutes.
   d. Format: Multiple choice, matching or short answer.
   e. Purpose is to test your knowledge and ability regarding the material covered in lecture & laboratory.
2. Case Study Assignments: There will be 3 assignments from the Case Studies Book.
   a. A substantial portion (5-10 questions) of each exam will involve the case study.
   b. You will work with a group to complete the case study based on the questions in the case study book.
   c. Case Studies will be assigned during the semester.

Points Distribution for Lecture:

<table>
<thead>
<tr>
<th>Exam 1</th>
<th>150 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 2</td>
<td>150 pts</td>
</tr>
<tr>
<td>Exam 3</td>
<td>150 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>150 pts</td>
</tr>
</tbody>
</table>

Lecture is worth 75% of final grade, Laboratory is worth 25%. Your lab instructor will provide a syllabus for the laboratory and outline assignments for lab.

Grading Scale:

| Grade | Percentage
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 93 A</td>
<td>92-90 A-</td>
</tr>
<tr>
<td>88-87 B+</td>
<td>86-83 B</td>
</tr>
<tr>
<td>82-80 B-</td>
<td>79-77 C+</td>
</tr>
<tr>
<td>76 - 73 C</td>
<td>72-70 C-</td>
</tr>
<tr>
<td>69 - 67 D+</td>
<td>66 - 63 D</td>
</tr>
<tr>
<td>62-60 D-</td>
<td>&lt; 60 F</td>
</tr>
</tbody>
</table>

SNAP students: Please notify my ASAP. The SNAP office will provide a testing space and oversee your examination.

Academic Honesty: The following website is the official policy on cheating:
http://policy.cofc.edu/documents/12.4.1.pdf You should read this and be sure you understand what cheating is and what the college-level penalties may be! I will involve the honor board if needed.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Exams &amp; Case Studies</th>
<th>Chapters in Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vascular/Blood</td>
<td></td>
<td>16, 15, 19</td>
</tr>
<tr>
<td>2</td>
<td>Vascular/Blood</td>
<td></td>
<td>16, 18, 19</td>
</tr>
<tr>
<td>3</td>
<td>Respiratory</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>Respiratory</td>
<td>Case Study A</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>Renal</td>
<td>Exam 1</td>
<td>9, 10</td>
</tr>
<tr>
<td>6</td>
<td>Renal</td>
<td></td>
<td>9, 10</td>
</tr>
<tr>
<td>7</td>
<td>Renal</td>
<td></td>
<td>9, 10</td>
</tr>
<tr>
<td>8</td>
<td>Digestion</td>
<td>Case Study B</td>
<td>22, 23</td>
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<tr>
<td>9</td>
<td>Digestion</td>
<td></td>
<td>22, 23</td>
</tr>
<tr>
<td>10</td>
<td>Digestion</td>
<td>Exam 2</td>
<td>22, 23</td>
</tr>
<tr>
<td>11</td>
<td>Immune</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>Endocrine</td>
<td>Case Study C</td>
<td>15</td>
</tr>
<tr>
<td>13</td>
<td>Reproductive</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>14</td>
<td>Skin</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Integrative Physiology</td>
<td>Exam 3</td>
<td>25</td>
</tr>
</tbody>
</table>

Final Exam
TOPIC LIST FOR BIOL222:

Use this list, coupled with lecture material, to identify important material for exams. If we do not cover it is STILL fair game for exams, so you should look up the material in your book. Material identified by "(BACKGROUND...FROM INTRO BIOL)" will not be specifically tested, but I do expect you to remember it from introductory biology (BIOL111, 112). Before each exam I will annotate this list to help guide you regarding the topics covered on the exam. You will be provided with a detail list in laboratory of the anatomical structures you are expected to learn.

ENZYMES AND METABOLISM
A. Enzyme Structure and Function (BACKGROUND...FROM INTRO BIOL)
   1. Function of enzymes in catalyzing biological reactions
   2. Redution of activation energy
   3. Substrates and enzyme specificity

B. Basic Metabolism
   1. Glycolysis (anaerobic and aerobic, substrates and products)
   2. Krebs cycle (substrates and products, general features of the pathway)
   3. Electron transport chain and oxidative phosphorylation (substrates and products, general features of the pathway)
   4. Metabolism of fats and proteins

GENERALIZED EUKARYOTIC CELL
A. Membrane-bound Organelles (BACKGROUND...FROM INTRO BIOL)
   1. Mitochondria
      a. site of ATP production
      b. self-replication; have own DNA and ribosomes
      c. inner and outer membrane
   2. Lysosomes (vesicles containing hydrolytic enzymes)
   3. Endoplasmic reticulum
      a. rough (RER) and smooth (SER)
      b. RER (site of ribosomes)
      c. role in membrane biosynthesis: SER (lipids), RER (transmembrane proteins)
      d. RER (role in biosynthesis of transmembrane and secreted proteins that cotranslationally targeted to RER by signal sequence)
   4. Golgi apparatus (general structure; role in packaging, secretion, and modification of glycoprotein carbohydrates)

B. Plasma Membrane
   1. General function in cell containment
   2. Protein and lipid components, fluid mosaic model
   3. Osmosis
   4. Passive and active transport
   5. Membrane channels
   6. Sodium–potassium pump
   7. Membrane receptors, cell signaling pathways, second messengers
   8. Membrane potential
   9. Exocytosis and endocytosis
   10. Cell–cell communication (general concepts of cellular adhesion)
       a. gap junctions
       b. tight junctions
       c. desmosomes

NERVOUS AND ENDOCRINE SYSTEMS
A. Endocrine System: Hormones
   1. Function of endocrine system (specific chemical control at cell, tissue, and organ levels)
   2. Definitions of endocrine gland, hormone
3. Major endocrine glands (names, locations, products)
4. Major types of hormones (groupings and examples)
5. Comprehensive list of hormones and functions

B. Endocrine System: Mechanisms of Hormone Action
1. Cellular mechanisms of hormone action
2. Transport of hormones (bloodstream)
3. Specificity of hormones (target tissue)
4. Integration with nervous system (feedback control)

VASCULAR, LYMPHATIC, AND IMMUNE SYSTEMS

A. Vascular System
1. Functions (circulation of oxygen, nutrients, hormones, ions, and fluids; removal of metabolic waste)
2. Role in thermoregulation
3. Bulk Flow
4. Systolic and diastolic pressure
5. Pulmonary and systemic circulation
6. Arterial and venous systems (arteries, arterioles, venules, veins)
   a. structural and functional differences
   b. pressure and flow characteristics
7. Capillary beds
   a. mechanisms of gas and solute exchange
   b. mechanism of heat exchange
8. Composition of blood
   a. plasma, chemicals, blood cells
   b. erythrocyte production and destruction (spleen, bone marrow)
   c. regulation of plasma volume
   d. coagulation, clotting mechanisms, role of liver in production of clotting factors
9. Oxygen and carbon dioxide transport by blood
   a. hemoglobin, hematocrit
   b. oxygen content
   c. oxygen affinity
10. Details of oxygen transport: biochemical characteristics of hemoglobin
    a. modification of oxygen binding affinity

B. Lymphatic System
1. Major functions
   a. equalization of fluid distribution
   b. transport of proteins and large glycerides
   c. return of materials to the blood
2. Composition of lymph (similarity to blood plasma; substances transported)
3. Source of lymph (diffusion from capillaries by differential pressure)
4. Lymph nodes (activation of lymphocytes)

C. Immune System: Innate and Adaptive Systems
1. Cells and their basic functions
   a. macrophages, neutrophils, mast cells, natural killer cells, dendritic cells
   b. T lymphocytes
   c. B lymphocytes, plasma cells
2. Tissues
   a. bone marrow
   b. spleen
   c. thymus
   d. lymph nodes
3. Basic aspects of innate immunity and inflammatory response
4. Concepts of antigen and antibody
5. Structure of antibody molecule
6. Mechanism of stimulation by antigen; antigen presentation

DIGESTIVE AND EXCRETORY SYSTEMS
A. Digestive System
1. Ingestion
   a. saliva as lubrication and source of enzymes
   b. epiglottal action
   c. pharynx (function in swallowing)
   d. esophagus (transport function)
2. Stomach
   a. storage and churning of food
   b. low pH, gastric juice, protection by mucus against self-destruction
   c. production of digestive enzymes, site of digestion
   d. structure (gross)
3. Liver
   a. production of bile
   b. roles in nutrient metabolism, vitamin storage
   c. roles in blood glucose regulation, detoxification
   d. structure (gross)
4. Bile
   a. storage in gallbladder
   b. function
5. Pancreas
   a. production of enzymes, bicarbonate
   b. transport of enzymes to small intestine
   c. structure (gross)
6. Small intestine
   a. absorption of food molecules and water
   b. function and structure of villi
   c. production of enzymes, site of digestion
   d. neutralization of stomach acid
   e. structure (anatomic subdivisions)
7. Large intestine
   a. absorption of water
   b. bacterial flora
   c. structure (gross)
8. Rectum (storage and elimination of waste, feces)
9. Muscular control
   a. sphincter muscle
   b. peristalsis

B. Renal System
1. Roles in homeostasis
   a. blood pressure
   b. osmoregulation
   c. acid–base balance
   d. removal of soluble nitrogenous waste
2. Kidney structure
   a. cortex
   b. medulla
3. Nephron structure
   a. glomerulus
   b. Bowman's capsule
   c. proximal tubule
   d. loop of Henle
e. distal tubule
f. collecting duct

4. Formation of urine
   a. glomerular filtration
   b. secretion and reabsorption of solutes
   c. concentration of urine
   d. countercurrent multiplier mechanism (basic function)
5. Storage and elimination (ureter, bladder, urethra)

RESPIRATORY SYSTEM
A. Respiratory System
1. General structure and function
   a. gas exchange, thermoregulation
   b. protection against disease, particulate matter
2. Breathing mechanisms
   a. diaphragm, rib cage, differential pressure
   b. resiliency and surface tension effects

SKIN SYSTEM
A. Skin System
1. Functions in homeostasis and osmoregulation
2. Functions in thermoregulation
   a. hair, erectile musculature
   b. fat layer for insulation
   c. sweat glands, location in dermis
   d. vasoconstriction and vasodilation in surface capillaries
3. Physical protection
   a. nails, calluses, hair
   b. protection against abrasion, disease organisms
4. Structure
   a. layer differentiation, cell types, tissue types (epithelial, connective)
   b. relative impermeability to water

REPRODUCTIVE SYSTEM AND DEVELOPMENT
A. Reproductive System
1. Male and female reproductive structures and their functions
   a. gonads
   b. genitalia
   c. differences between male and female structures
2. Gametogenesis by meiosis
3. Ovum and sperm
   a. differences in formation
   b. differences in morphology
   c. relative contribution to next generation
4. Reproductive sequence (fertilization, implantation, development, birth)
5. Menstrual cycle
   a. Hormonal control and cellular/tissue changes
   b. Pregnancy & Birth
Instructor:
Office Hours:
Required Texts:
1. Lab Manual from SAS-E INK, this manual outlines the physiology laboratory exercises and provides a list of anatomical structures for each body system. We will use this during both Semesters (BIOL221 and BIOL222)

Learning Outcomes:
1. Identify and use the basic vocabulary of human anatomy and physiology
2. Reiterate the relationship between structure and function for each human body system and relate it to some human diseases
3. Demonstrate an understanding of the scientific method and experimental design
4. Continue to develop written, oral, group-work and computational skill sets

Assessment:
1. Written Laboratory Reports: There will be 2 mini-reports and 1 final project report.
   a. Details can be found in the laboratory manual.
2. Oral Laboratory Presentations: There will be 1 mini-project presentation and 1 final project presentation
   a. Details can be found in the laboratory manual.
3. Participation: You are expected to be present, on-time to each laboratory. You are also expected to be more than a lump on a lab stool...that means I should see you interacting with your group, actively performing the activities, and asking questions. It's not hard to earn these points...attend lab and engage in what we are doing. This also means I should not see you checking facebook, email, espn, you tube etc. on your phones/pads/computers.

Points Distribution:
Mini-reports 40 pts
Final Report 60 pts
Mini Presentation 20 pts
Final Presentation 60 pts
Participation Points 20 pts

Total 200 PTS (25% of overall grade in BIOL222)

Attendance: Miss one unexcused lab: lose half of participation points (10 points). Miss two labs (excused or unexcused): lose all of participation points (20 pts). Miss three labs (excused or unexcused): lose all of lab points (200 pts).

Academic Honesty: If I suspect you are cheating I will give you a 0 on the assignment and/or report you to the Dean of Students for an Honor Board hearing.

Schedule: SEE NEXT PAGE

Safety: SSM/Biology Safety Policy will be distributed and followed.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blood Vessel Anatomy</td>
</tr>
<tr>
<td>2</td>
<td>Blood Vessel Physiology</td>
</tr>
<tr>
<td>3</td>
<td>Respiratory Anatomy</td>
</tr>
<tr>
<td>4</td>
<td>Respiratory Physiology 1</td>
</tr>
<tr>
<td>5</td>
<td>Mini-Project 1</td>
</tr>
<tr>
<td>6</td>
<td>Renal Anatomy</td>
</tr>
<tr>
<td>7</td>
<td>Renal Physiology</td>
</tr>
<tr>
<td>8</td>
<td>Mini-Project 2</td>
</tr>
<tr>
<td>9</td>
<td>Mini-Project Presentations and Begin Digestive Anatomy</td>
</tr>
<tr>
<td>10</td>
<td>Digestive Anatomy</td>
</tr>
<tr>
<td>11</td>
<td>Immune and Endocrine Anatomy</td>
</tr>
<tr>
<td>12</td>
<td>Reproductive and Skin Anatomy</td>
</tr>
<tr>
<td>13</td>
<td>Final Group Project</td>
</tr>
<tr>
<td>14</td>
<td>Final Group Project</td>
</tr>
<tr>
<td>15</td>
<td>Final Group Presentation</td>
</tr>
</tbody>
</table>
FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
- Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
- Fill out the parts of the form specified in part B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Eric McElroy  Phone: 9533707  Email: mcelroye@cofc.edu
Department or Program: Biology  School: SSM
Subject Acronym and Course Number: BIOL201/201L
Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☐ Add a New Course (complete parts C, D, F, G, H, I, J, K)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J, K)
   ☐ Course Number
   ☐ Course Name
   ☐ Course Description
   ☐ Credit/Contact Hours
   ☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☒ Deactivate an Existing Course (complete parts C, D, E, G, I, J, K)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J, K)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

We are creating a new Human and Anatomy year-long sequence (BIOL221 and 222, with labs). These will replace BIOL201 and BIOL202 (see additional form for BIOL202/202L)

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Students in all programs should have a better understanding of human anatomy and physiology as a result of this change, which will enhance their progression through each degree program.

The Department of Health and Human Performance, the Department of Biology and the Data Science Major within the Department of Computer Science use these courses in their programs as requirements to complete the major and/or as prerequisites for upper division courses. Please see attached letters outlining how the new courses will integrate into their curriculum.

This form was last updated on 06/03/13 and replaces all others.
E. EXISTING COURSE INFORMATION. If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: Biology  
School: SSM  
Subject Acronym: BIOL  
Course Number: 201/201L

Credit hours:  3 lecture  1 lab  _ seminar _ independent study  
Contact hours:  3 lecture  3 lab  _ seminar _ independent study

Course title: Human Physiology

Course description (maximum 50 words, exactly as it appears in the catalog):

An introduction to the structure and function of the major organ systems of the human body. Lectures three hours per week, laboratory three hours per week. This course is specifically intended for preallied health, physical education, and pre-nursing majors.

Restrictions (pre-requisites, co-requisites, majors only, etc.):

BIOL111/111L, BIOL112/112L

Cross-listing, if any:

Is this course repeatable? □ yes  ☒ no  If yes, how many total credit hours may the student earn? ___

F. NEW COURSE INFORMATION. If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use boldface for the information that is changing.

Department:  
School:  
Subject Acronym:  
Course Number:

Credit hours:  _ lecture _ lab _ seminar _ independent study  
Contact hours:  _ lecture _ lab _ seminar _ independent study

Course title:

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

If this is a newly-created course, is it intended to be the equivalent of an existing course and replace it? □ yes  ☒ no  If so, which course? ______________

Note: You must deactivate that course by submitting an additional Course Form.

Cross-listing, if any (submit approval from relevant department):

Note: Cross-listed courses are equivalent.

Is this course repeatable? □ yes  ☒ no  If yes, how many total credit hours may the student earn? ___

Is there an activity, lab, or other fee associated with this course? □ yes  ☒ no  What is the fee? $_____

This form was last updated on 06/03/13 and replaces all others.
Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

G. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.
None.

H. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
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<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1.</td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration? □ yes □ no

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.
J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☐ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☐ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
- Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
- Fill out the parts of the form specified in part B. **You must do this before your request can move forward!**
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Eric McElroy  Phone: 9533707  Email: mcelroye@cofc.edu

Department or Program: Biology  School: SSM

Subject Acronym and Course Number: BIOL202/202L

Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☐ Add a New Course (complete parts C, D, F, G, H, I, J, K)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J, K)
☐ Course Number
☐ Course Name
☐ Course Description
☐ Credit/Contact Hours
☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☒ Deactivate an Existing Course (complete parts C, D, E, G, I, J, K)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J, K)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

We are creating a new Human and Anatomy year-long sequence (BIOL221 and 222, with labs). These will replace BIOL201 and BIOL202 (see additional form for BIOL201/201L).

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Students in all programs should have a better understanding of human anatomy and physiology as a result of this change, which will enhance their progression through each degree program.

The Department of Health and Human Performance, the Department of Biology and the Data Science Major within the Department of Computer Science use these courses in their programs as requirements to complete the major and/or as prerequisites for upper division courses. Please see attached letters outlining how the new courses will integrate into their curriculum.
E. **EXISTING COURSE INFORMATION.** If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: Biology  
School: SSM  
Subject Acronym: BIOL  
Course Number: 202/202L

Credit hours: 3 lecture 1 lab ___ seminar ___ independent study  
Contact hours: 3 lecture 3 lab ___ seminar ___ independent study

Course title: Human Anatomy

Course description (maximum 50 words, exactly as it appears in the catalog):

An introduction to the gross morphology and microscopic anatomy of the major organ systems of the human body. Lectures three hours per week; laboratory three hours per week. This course is specifically intended for pre-allied health, physical education, and pre-nursing majors.

Restrictions (pre-requisites, co-requisites, majors only, etc.):
BIOL111/111L, BIOL112/112L

Cross-listing, if any:

Is this course repeatable?  □ yes  ☒ no  If yes, how many total credit hours may the student earn? ___

F. **NEW COURSE INFORMATION.** If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use **boldface** for the information that is changing.

Department:  
School:  
Subject Acronym:  
Course Number:  

Credit hours: ___ lecture ___ lab ___ seminar ___ independent study  
Contact hours: ___ lecture ___ lab ___ seminar ___ independent study

Course title:

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

If this is a newly-created course, is it intended to be the equivalent of an existing course and replace it?  □ yes  □ no  
If so, which course? ____________

Note: You must deactivate that course by submitting an additional Course Form.

Cross-listing, if any (submit approval from relevant department):

Note: Cross-listed courses are equivalent.

Is this course repeatable?  □ yes  □ no  If yes, how many total credit hours may the student earn? ___

Is there an activity, lab, or other fee associated with this course?  □ yes  □ no  What is the fee? $_____

Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

This form was last updated on 06/03/13 and replaces all others.
G. **COSTS.** List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.  
None.

H. **STUDENT LEARNING OUTCOMES AND ASSESSMENT.**

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<tr>
<th>Student Learning Outcomes</th>
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</tbody>
</table>

1.  

2.  

3.  

4.  

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?  

I. **PROGRAM CHANGES.** Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration?  
☐ yes  ☒ no

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.
J. CHECKLIST.

☑️ I have completed all relevant parts of the form.

☑️ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☐ (For new courses only) I have attached a syllabus.

☑️ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☐ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☑️ I have submitted **one** Signature Form that lists all of the different forms I am submitting.
FACULTY CURRICULUM COMMITTEE
CHANGE/DELETE PROGRAM FORM

Instructions:
- Please fill out all of the portions of the form that are specified in section B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, please start by checking the detailed instructions on the website.
- Please feel free to contact the committee chair with any remaining questions you might have.

A. CONTACT INFORMATION.

Name: Eric McElroy  Phone: 843-953-3707  Email: mcelroye@cofc.edu

School: SSM  Department or Program: Computer Science

Name and Acronym of Major: Data Science with Exercise Physiology Cognate

B. CATEGORY OF REVIEW. Please check all that apply, then fill out the specified parts of the form.

☒ Change Request (fill out all sections)
☐ Add an existing course to requirements or electives
☐ Add a new course to requirements or electives (attach completed course form for each)
☐ Delete courses from requirements or electives
☐ Add or modify concentration*
☒ Add or modify cognate*

*Note: Only concentrations and cognates requiring 18 or more credit hours will be tracked in Banner and Degree Works and noted on the transcript.

☐ Terminate Program (fill out E, G, H, and I)
☐ Terminate degree
☐ Terminate major
☐ Terminate concentration
☐ Terminate cognate

C. GENERAL INFORMATION

Number of Current Credit Hours (for existing program): 16 hours for the Cognate
Number of Proposed Credit Hours (for changed program): 20 hours for the Cognate
Catalog Year in which changes will take effect: FALL 2016

D. CURRICULUM. Please list every change you are making below AND attach the current Program of Study Worksheet for this major (http://registrar.cofc.edu/program-of-study-worksheets/index.php) with changes marked in RED. Additions should show where the course will be inserted, deletions should be noted by crossing out the course, and moves indicated with arrows. Distinguish between required and elective courses, and note any prerequisites, co-requisites, sequencing, or other restrictions. Provide the catalog description and course list exactly as they should appear in the catalog. For each new course, submit the Curriculum Committee’s Course Form and a sample syllabus.

BIOL221/221L will be added.  BIOL222/222L will replace BIOL201
E. RATIONALE AND EXPLANATION. Please provide a narrative addressing the request you are making and why you are making it.
We are changing the Anatomy and Physiology curriculum to a year long sequence. As such students in the Exercise Physiology Cognate need both courses (BIOL221/221L and BIOL222/222L) to have the background in physiology needed to complete the cognate

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
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<tr>
<td>What will students know and be able to do when they complete the major or program?</td>
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</tr>
</tbody>
</table>

1. NO CHANGE FROM ORIGINAL MAJOR

2. 

3. 

4. 

Additional Outcomes or Comments:
G. IMPACT ON EXISTING PROGRAMS AND COURSES. Please describe the impact of this request on other programs and courses. If you are deleting a program, please describe the effect on all programs that will be impacted; if you are adding or changing a program, please explain any overlap with existing programs at the College.

None.

H. COSTS ASSOCIATED WITH THE REQUESTED ACTION. List all of the new costs or cost savings (including new faculty/staff requests, library, or equipment) associated with your request.

None.

I. CHECKLIST

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ I have attached a Course Form for each newly-created or modified course.

☒ (For proposals that affect other departments in any way) I have attached an acknowledgement from the relevant department.

☒ I have provided the complete curriculum for the program, concentration, emphasis, etc., including the description and course list, exactly as it should appear in the catalog.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
Data Science Major with Exercise Physiology Cognate Requirements
Catalog Year: 2013-14
Degree: Bachelor of Science
Credit Hours: 73+

“PR” indicates a pre-requisite. “CO” indicates a co-requisite.

Courses within this major may also satisfy general education requirements. Please consult http://registrar.cofc.edu/general-edu for more information.

Required Courses
- DATA 101 Introduction to Data Science (3) PR: None
- DATA 210 Dataset Organization and Management (3) PR: None
- DATA 495 Data Science Capstone (3) PR: DATA 210, CSCI 470, and MATH 441

Math Requirement
- MATH 120 Introductory Calculus (4) PR: Placement or C- or better in MATH 111
- MATH 203 Linear Algebra (3) PR: MATH 220 or instructor permission
- MATH 207 Discrete Structures I (3) PR: MATH 105, MATH 111, or MATH 120
- MATH 220 Calculus II (4) PR: MATH 120 or HONS 115
- MATH 250 Statistical Methods I (3) PR: MATH 111 or MATH 120 or instructor permission
- MATH 350 Statistical Methods II (3) PR: MATH 120, MATH 250
- MATH 440 Statistical Learning I (3) PR: MATH 203, MATH 220, MATH 350
- MATH 441 Statistical Learning II (3) PR: MATH 440

Computer Science Requirement
- CSCI 220 Computer Programming I (3) PR: CSCI 120 or CSCI 180 or CSCI 210 or MATH 111 CO: CSCI 220L
- CSCI 220L Computer Programming I Lab (1) CO: CSCI 220
- CSCI 221 Computer Programming II (3) PR: CSCI 220, CSCI 220L; CO or PR: MATH 207
- CSCI 230 Data Structure and Algorithms (3) PR: CSCI 221, MATH 207
- CSCI 310 Advanced Algorithms (3) PR: CSCI 230, MATH 207
- CSCI 334 Data Mining (3) PR: CSCI 221, MATH 207, MATH 250
- CSCI 470 Principles of Artificial Intelligence (3) PR: CSCI 230, MATH 307

Select a cognate from the following: Accounting, Biomechanics, Customer Relationship Management, e-Commerce, Economics, Exercise Physiology, Finance, Geoinformatics, Molecular Biology, Organismal Biology, Physics and Astronomy, Psychology, Sociology and Supply Chain Management.

Exercise Physiology Cognate Requirements
- BIOL 111 Introduction to Cell and Molecular Biology (3) CO: BIOL 111L
- BIOL 111L Introduction to Cell and Molecular Biology Lab (1) CO: BIOL 111
- BIOL 112 Evolution, Form, and Function of Organisms (3) PR: BIOL 111/111L; CO: BIOL 112L
- BIOL 112L Evolution, Form, and Function of Organisms Lab (1) CO: BIOL 112
☐ BIOL222 Human Anatomy and Physiology 2 (4) PR: BIOL221
☐ PEHD 340 Exercise Physiology and Lab (4) PR: BIOL 201, EXSC/PEHD 201

ADD: BIOL221 Human Anatomy and Physiology 1 (4) PR: BIOL 111/111L, 112/112L
November 5, 2013

To whom it may concern:

The department of Biology is proposing a change in the anatomy and physiology sequence. Dr. Eric McElroy has communicated with me frequently during the planning stages and has provided me with a list of courses that could be affected by the change. I consulted with my faculty and reviewed the courses that require the anatomy and physiology sequence. I am writing this letter in support of the change from BIOL 202 Anatomy and BIOL 201 Physiology to the new Anatomy and Physiology I (BIOL 221) and Anatomy and Physiology II (BIOL 222) sequence. Under the current plan, the changes should have minimal impact on our offerings in Health and Human Performance.

Sincerely,

Michael G. Flynn
Chair, Department of Health and Human Performance

List of Courses Affected by Anatomy and Physiology Curricular Changes

<table>
<thead>
<tr>
<th>Course</th>
<th>Old Curriculum Prereq</th>
<th>New Curriculum Prereq</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAL333</td>
<td>BIOL201</td>
<td>BIOL222</td>
</tr>
<tr>
<td>EXSC330</td>
<td>BIOL202</td>
<td>BIOL221</td>
</tr>
<tr>
<td>EXSC340</td>
<td>BIOL201</td>
<td>BIOL222</td>
</tr>
<tr>
<td>ATEP430</td>
<td>BIOL201 &amp; BIOL202</td>
<td>BIOL222</td>
</tr>
<tr>
<td>ATEP365</td>
<td>BIOL201</td>
<td>BIOL222</td>
</tr>
<tr>
<td>EXSC438</td>
<td>BIOL202</td>
<td>BIOL222</td>
</tr>
<tr>
<td>EXSC440</td>
<td>BIOL202</td>
<td>BIOL221</td>
</tr>
</tbody>
</table>

Rationale: In the new curriculum, BIOL221 will cover the anatomy and physiology of the nervous, muscular and skeletal systems, these concepts are essential for EXSC330 and EXSC440. All other courses rely on the students' having learned the physiology of the entire human body, which will only be complete after BIOL222.
To Whom It May Concern:

The department of Biology is proposing a change in the anatomy and physiology sequence. Dr. Eric McElroy has communicated with me frequently during the planning stages and has provided me with a list of courses that could be affected by the change. I consulted with my faculty and reviewed the courses that require the anatomy and physiology sequence. I am writing this letter in support of the change from BIOL 202 Anatomy and BIOL 201 Physiology to the new Anatomy and Physiology I (BIOL 221) and Anatomy and Physiology II (BIOL 222) sequence. Under the current plan, the changes should have minimal impact on our offerings in Data Science Program, specifically two cognates will have to be updated. The biomechanics cognate will replace BIOL 202 with BIOL 221. The exercise physiology cognate will replace BIOL 201 with BIOL 221 and BIOL 222.

Sincerely,

[Signature]

Paul Anderson, Ph. D.
Assistant Professor
Department of Computer Science
February 12, 2014

To whom it may concern:

I write this letter to convey that the Biology Department fully supports the proposed removal of our old courses BIOL 202 Human Anatomy and BIOL 201 Human Physiology, and to replace these with the new sequence BIOL 221 Human Anatomy and Physiology I and BIOL 222 Human Anatomy and Physiology II. This change will allow enhanced conceptual integration between the anatomical structure and physiological function of the body systems. BIOL201 or 202 can currently be used to earn a B.A. in Biology and for a minor in Biology. With the proposed changes, BIOL 221 and BIOL 222 can be used to earn these degrees in the same way that BIOL 201 or BIOL 202 are used currently.

Sincerely,

[Signature]

Jaap Hillenius
Chair, Department of Biology
13 December 2013

To Whom It May Concern:

The Office of the Registrar, Dr. Lynne Ford (Assoc. Provost for Curriculum & Academic Administration), Dan Greenburg (FCC Chair), and Dr. Eric McElroy and Dr. Jaap Hillenius from the Biology department have met and discussed the proposal to deactivate BIOL 201/201L and BIOL 202/202L which will be become the following courses: BIOL 221/221L and BIOL 222/222L.

It was decided by all parties that the Biology Department would only need to complete New Course Forms for BIOL 221/221L and 222/222L and Course Deactivation Forms for BIOL 201/201L and 202/202L. To help facilitate this change, and to ease the process by which it is approved, these are the only FCC forms that are required along with acknowledgment from any departments or programs who currently use BIOL 201/201L and/or BIOL 202/202L within their majors or course prerequisites.

Additional major or course change forms are not needed since these courses, while systemically different, are identical/equivalent and already part of the major(s) and/or courses. In this case, when implementing this change from the BIOL 201/202 sequence to the new BIOL 221/222 sequence our office will automatically make the changes to all other affected courses and majors accordingly.

Sincerely,

Franklin J. Czwaszka, M.A. | Catalog Manager
Registrar’s Office, College of Charleston
Charleston, SC 29424
(p) 843.953.5421 (f) 843.953.6560 (a) czwaszka@cfc.edu