In section A, list ALL of the forms covered by your proposal. If there is a form that is not listed in A, your proposal will be held back until we receive a new, updated description of the form(s) you are submitting. You must obtain the signature of your department chair and the signatures of the Academic Dean, Provost, Business Affairs, Curriculum Committee Chair, Budget Committee Chair, and the Academic Planning Committee Chair 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.

BIOL 354, New Course Form
BIOL Change in Major Form (B.S.)
BIOL Change in Major Form (B.S. with Concentration in Molecular Biology)
BIOL Change in Major Form (B.A.)
BIOL Change in Major Form (Marine Biology B.S.)
BIOL Change in Major Form (B.S. major Teaching Option)
BIOL Change in Minor Form
NEUROSCIENCE Change in Minor Form

B. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:
   
   [Signature]
   
   Date: 2/19/13 (Biology Chair)

2. Signature of Academic Dean:
   
   [Signature]
   
   Date: 2/2/13

3. Signature of Provost:
   
   [Signature]
   
   Date: 3/7/13

4. Signature of Business Affairs (only for course fees):
   
   Date: __________________________

   □ fee approved on ________________  
   □ BOT approval pending

5. Signature of Curriculum Committee Chair:
   
   Date: __________________________

6. Signature of Budget Committee Chair (only for new programs):
   
   Date: __________________________

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

8. Signature of Faculty Senate Secretary:
   
   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, please 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: Jeffrey D. Triblehorn       Phone: 843-953-5848       Email: triblehornj@cofc.edu

Department or Program: Biology       School: SSM

Subject Acronym and Course Number: BIOL354

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, H, 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.

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to other students with the required pre-requisites (drawing mostly from the Departments of Biology and
Psychology, but potentially from the Department of Physics and Astronomy and Department of Chemistry and Biochemistry).

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on 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.

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.

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  Pass/fail?  □ yes  □ no  
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: 354
Credit hours:  _2_ lecture _2_ lab _ _ seminar _ _ independent study  Pass/fail?  □ yes  X no
Contact hours:  _2_ lecture _4_ lab _ _ seminar _ _ independent study

Course title: Techniques in Neuroscience

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

An intensive "hands-on" laboratory-focused course incorporating several techniques used in neuroscience research, including electrophysiology, neuroanatomy, histology, and behavioral analysis. Students will use these techniques to investigate various concepts in cellular and systems neuroscience. Students will engage in scientific discourse and present ideas in both verbal and written form.

Restrictions (pre-requisites, co-requisites, majors only, etc.):
Pre-requisites:  BIOL351 or PSYC351
and
MATH250 or PSYC211 and PSYC220 or PSYC250
and
Permission of instructor

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

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 lab fees charged for all lab courses offered by the Biology Department. No additional fees._____ 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.

If this is a newly-created course, is it intended to be the equivalent of an existing course?  □ yes  X no
If so, which course?  ________________ Note: You must deactivate the course by submitting an additional Course Form.

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

Dr. Jeffrey D. Triblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Triblehorn’s laboratory colony.
Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

**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><strong>1. Enhance student knowledge of experimental design, analysis, and communicating experimental results.</strong></td>
<td>The instructor will assess learning outcome 1 through written assignments involving creating graphical representations of data and relating experimental results to the neurobiological concepts discussed in lecture and investigated in lab.</td>
</tr>
<tr>
<td></td>
<td>Grade A = Student correctly creates graphical representations of data collected in lab and relates the experimental results to neurobiological concepts for at least 90% of each assignment.</td>
</tr>
<tr>
<td></td>
<td>Grade B = As above for 80-90% of each assignment.</td>
</tr>
<tr>
<td></td>
<td>Grade C = As above for 70-80% of each assignment.</td>
</tr>
<tr>
<td></td>
<td>Grade D = As above for 60-70% of each assignment.</td>
</tr>
<tr>
<td></td>
<td>Grade F = As above for less than 60% of each assignment.</td>
</tr>
</tbody>
</table>

| 2. Enhance student ability to critically consider research problems from different perspectives and integrate these perspectives to gain a better understanding of research problems. | The instructor will assess learning outcome 2 through written assignments relating experimental results using multiple techniques to each other and to the neurobiological concepts discussed in lecture and investigated in lab. |
|                                                                                          | Grade A = Student correctly relates experimental results collected from multiple experiments in lab to each other and to neurobiological concepts for least 90% of each assignment. |
|                                                                                          | Grade B = As above for 80-90% of each assignment.                                                    |
|                                                                                          | Grade C = As above for 70-80% of each assignment.                                                    |
|                                                                                          | Grade D = As above for 60-70% of each assignment.                                                    |
|                                                                                          | Grade F = As above for less than 60% of each assignment.                                             |
3. Enhance student ability to read and evaluate primary scientific literature and apply knowledge gained to research problems.

The instructor will assess learning outcome 3 through written and oral assignments integrating primary literature.

Grade A = Student correctly relates primary literature to experimental design and experimental results collected in lab for least 90% of each assignment and is able to communicate knowledge gained from primary literature with 90% effectiveness.

Grade B = As above for 80-90% of each assignment and 80-90% effectiveness.

Grade C = As above for 70-80% of each assignment and 70-80% effectiveness.

Grade D = As above for 60-70% of each assignment and 60-70% effectiveness.

Grade F = As above for less than 60% of each assignment and less than 60% effectiveness.

4. Develop skills in different techniques used in neuroscience research.

The instructor will assess learning outcome 4 through observation of student effort in conducting intensive “hands on” experiments, not on proficiency to perform the techniques.

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?

Techniques in Neuroscience is a “high impact” course designed for a maximum of 8-10 students per laboratory section. Increasing the number of high impact learning experiences is part of the College of Charleston Strategic Plan.

Techniques in Neuroscience fits with the goals of the Neuroscience Program and minor, where students gain:

1) an understanding of molecular, cellular, and systems neuroscience

2) an appreciation for the multidisciplinary and comparative nature of the field of neuroscience.

3) experience conducting neuroscience research.

4) professional communication skills (in both verbal and written form) for presenting scientific research.

The course also aligns with several areas of assessment identified by the Biology Department, including:

1) the Core Concept of Structure and Function (i.e. how neurons and neural interactions underlie nervous system function and behavior)

2) the Core Competencies of:

   a) Ability to apply the process of science (i.e. experimental design and methodology; forming research questions)
b) Ability to use quantitative reasoning (quantitative analysis to provide answers to research questions)

c) Ability to tap into the interdisciplinary nature of science (neuroscience has always been an interdisciplinary field and this course has attracted both Biology and Psychology students)

d) Ability to communicate and collaborate with other disciplines (as stated for #2c)

3) "a curriculum that emphasizes scientific knowledge, theory, and process across levels of biological organizations and taxonomic diversity" (From the Department of Biology Mission Statement). Techniques in Neuroscience provides "hands on" experience with neuroscience techniques to investigate concepts in neuroscience, investigate how activity at the neuronal level correlates to activity at the behavioral level and does so by incorporating several different animal models (including both invertebrate and vertebrate animals) in the course.

4) "Educating students in the biological sciences requires they gain hands-on exposure to specimens, methodology, and equipment in modern, well-equipped laboratories" (From the Department of Biology Mission Statement). Techniques in Neuroscience is an intensive "hands-on" laboratory focused course where students perform entire neuroscience experiments beginning from experimental setup, surgeries, data collection and analysis, interpretation, and presentation of results in written and oral form. The lab contains experimental setups containing research grade equipment at a total cost of $250,000, funded primarily through a Howard Hughes Medical Institute grant awarded to the College of Charleston as well as from funds from the School of Science and Math.

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration? If so, please explain briefly and attach a Change Minor or Change Major/Program Form as appropriate.

Interdisciplinary Neuroscience minor: can fulfill the Special Neuroscience Electives requirement for the minor

Biology major: can serve as an elective for Biology major (could fulfill one of the 300 level and above Biology lab courses required for the Biology B.S., Biology B.S. with concentration in molecular biology, Biology B.A. or a 300 level and above elective for the Marine Biology B.S.)

Biology minor: can serve as an elective for Biology minor (could fulfill a 300 level and above elective for the Biology minor)
J. CHECKLIST.

X I have completed all relevant parts of the form.

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

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

X (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.

K. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:

[Signature]
Date: 2/18/13

2. Signature of Academic Dean:

[Signature]
Date: 2/21/13

3. Signature of Provost:

[Signature]
Date: 3/7/13

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 Faculty Senate Secretary:

[Signature]
Date: ________________

Date Approved by Faculty Senate: ________________

Page 7 of 7
BIOL354 (4 credits)
Techniques in Neuroscience

Instructor: Dr. Jeffrey D. Triblehorn
Email: triblehornj@cofc.edu
Office: RHSC 205
Phone: (843) 953-5848
Office hours: M10-11am and by appointment
Lecture: RHSC 301 (MW 9:00-9:50)
Lab: RHSC 300 (W 1:15-5:45)

1. Course prerequisites
   BIOL351 or PSYC351
   and
   MATH250 or PSYC211 and PSYC220 or PSYC250
   and
   Permission of Instructor

2. Learning outcomes
   a. Enhance student knowledge of experimental design, analysis, and communicating experimental results
   b. Enhance student ability to critically consider research problems from different perspectives and integrate these perspectives to gain a better understanding of research problems.
   c. Enhance student ability to read and evaluate primary scientific literature and apply knowledge gained to research problems.
   d. Develop skills in different techniques used in neuroscience research.

3. Required reading
   There is no text available for a class such as this. A lab manual prepared by the instructor will be required and be provided as a PDF. Some labs may have additional readings from the primary literature. References will be provided for articles available at Addlestone Library or otherwise be provided by the instructor. Each lab will also have a detailed lab guide for that day’s experiment that must be read prior to coming to lab!

4. Course description
   The Techniques in Neuroscience course (BIOL354) is a junior/senior-level laboratory course designed to introduce students to some of the techniques used in neuroscience research. These techniques include:
   - Implementation of standard laboratory electronic equipment such as amplifiers and analog-to-digital converters
   - Electrical stimulation of nerves
   - Microsurgery
   - Stereotaxic surgery
   - Multi-unit central nervous system (CNS) recordings
   - Intracellular recordings
   - Whole nerve recordings
   - Analysis of neural activity (such as thresholding and cluster analysis)
   - Neuroanatomical tract tracing and histological techniques
   - Behavioral testing
These techniques will be employed to investigate various concepts in neuroscience including:

- Sensory processing
- Neural communication
- Neural encoding
- Organization of information in the brain
- Motor activity
- Sensorimotor integration
- Neurmodulation
- Mapping neural circuits

5. Course policies and procedures

The class will meet three times per week. There will be two one hour lecture sections and a four and one-half hour combined lecture/lab section with the following exception:

Brain tissue cutting and histology (Week 9)

We will meet as a class during the normal lecture time and students will schedule sessions lasting 3-4 hours throughout that week to slice their rat brain. You will also need to come in a second time within the following four weeks to stain your tissue sections and examine them under the microscope. This is necessary due to the limitations of available equipment for sectioning and viewing brain sections. I will be as accommodating as possible during this week but it is up to you to plan ahead accordingly and to discuss any potential problems with me as early as possible. Inability to perform the labs during those weeks due to scheduling issues will incur the penalty described below (see Evaluation).

5a. Lecture component

The lecture will vary throughout the semester, but the material covered will consist of four general topics: 1) presentation of necessary background material for the next lab provided by the instructor; 2) a “debriefing” of the previous lab, including what went right and wrong, solutions that were attempted (and the outcomes), and results that different groups obtained; 3) class discussions to scenarios posed by the instructor regarding a research, methodological, or conceptual question pertinent to the next lab; 4) discussions of other neuroscience techniques not performed in the labs.

5b. Lab component

The lab portion will begin with a lecture covering the necessary technical information relevant for that day’s lab. Potential trouble spots and solutions will also be highlighted. Students must read through all lab procedures and required background material prior to the lab and should bring up any questions, clarifications, and/or concerns during this period. Working in groups of two, students will be in charge of preparing the experiment (i.e. setting up the equipment, performing the surgeries, obtaining the recordings, etc.), collecting and documenting the necessary data, and interpreting that data.

5c. Expectations

Students are expected to participate in all aspects of the class. This includes: 1) actively participating in lecture and lab discussions; 2) attending both lab and lecture (i.e. attendance is mandatory to both); 3) reading all necessary material before coming to lab; 4) engaging in the experiments; 5) handing in assignments. Since we are dealing with live animals (both vertebrates and invertebrates), it is important to read and be
familiar with that day's procedures before coming to lab and to ask questions regarding the procedures. Given the nature of the labs, rescheduling or lab make-ups will not be possible.

6. Evaluation

Grades will be based on effort, conceptual understanding of the material and interpretation of data in both written and oral forms. Grades will not be based on proficiency with the techniques.

Each student will be expected to complete five (5) lab worksheets (Modules 1, 2, 4, 5, and 6), one (1) lab report (Module 3), and a final presentation (during the final exam period). The worksheets provide a concise way to report your results and conclusions from the lab work and require substantially less work than the full lab report. The full lab report will be in the format of a scientific paper (Abstract, Introduction, Material/Methods, Results, Discussion, References). These reports will pull together all aspects of the laboratory work for that module and will be 10-15 pages long (for the Introduction, Material/Methods, Results, Discussion portions).

The final presentation will be on a recent advancement in neuroscience techniques, chosen by the student but approved by the instructor. It cannot be on a technique covered in the course (lecture or lab) or in the Seminar in Neuroscience course (BIOL/PSYC448). The presentation will consist of an overview of the technique and its implementation in neuroscience research from the primary literature. This will be a PowerPoint presentation, 15-20 minutes in length, presented to the class during the final exam period.

Assessment of assignments will be based on a letter grade scale converted to a numerical value based on the table below. Each portion of the assignment (i.e. each question for worksheets or each section for the lab report) will be assigned a letter grade, with average being the final grade for the assignment. The final course grade for each student will be computed by taking the simple average of the worksheets, lab report, and final presentation. The worksheets and presentation are equally weighted, the lab report is worth double.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>100</td>
</tr>
<tr>
<td>A</td>
<td>95</td>
</tr>
<tr>
<td>A-</td>
<td>91</td>
</tr>
<tr>
<td>B+</td>
<td>88</td>
</tr>
<tr>
<td>B</td>
<td>85</td>
</tr>
<tr>
<td>B-</td>
<td>81</td>
</tr>
<tr>
<td>C+</td>
<td>78</td>
</tr>
<tr>
<td>C</td>
<td>75</td>
</tr>
<tr>
<td>C-</td>
<td>71</td>
</tr>
<tr>
<td>D+</td>
<td>68</td>
</tr>
<tr>
<td>D</td>
<td>65</td>
</tr>
<tr>
<td>D-</td>
<td>61</td>
</tr>
<tr>
<td>F</td>
<td>55</td>
</tr>
<tr>
<td>Average Percentage</td>
<td>Final Grade</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>93% and higher</td>
<td>A</td>
</tr>
<tr>
<td>90-92.9%</td>
<td>A-</td>
</tr>
<tr>
<td>87-89.9%</td>
<td>B+</td>
</tr>
<tr>
<td>83-86.9%</td>
<td>B</td>
</tr>
<tr>
<td>80-82.9%</td>
<td>B-</td>
</tr>
<tr>
<td>77-79.9%</td>
<td>C+</td>
</tr>
<tr>
<td>73-76.9%</td>
<td>C</td>
</tr>
<tr>
<td>70-72.9%</td>
<td>C-</td>
</tr>
<tr>
<td>67-69.9%</td>
<td>D+</td>
</tr>
<tr>
<td>63-66.9%</td>
<td>D</td>
</tr>
<tr>
<td>60-62.9%</td>
<td>D-</td>
</tr>
<tr>
<td>&lt;60%</td>
<td>F</td>
</tr>
</tbody>
</table>

7. Penalties for lateness or missing lectures or labs

It will become immediately evident that we have a lot of material to go over in the two 50 minute lectures per week. Besides providing information that will enhance your experience in this course, the lectures include critical information that will help you perform the experiments. This information will expedite your performance of the labs, not only allowing you to finish during the allotted time but also obtain better data! Furthermore, lectures address the ethical treatment of the research animals. The majority of the experiments included in this course involve terminal procedures. It is disrespectful to the animals (regardless of whether they are vertebrates or invertebrates) to be late or miss lectures or labs.

Although this should be enough to have students show up and be on time for each lecture and lab, this has not always been the case. Therefore, the following penalties will be levied for being late or missing classes:

- Late to lecture or lab = 3% deduction per incident
- Missing lecture = 6% deduction per incident
- Missing lab = Final grade will be reduced by two-thirds grade for each lab missed (for example, from B+ to B-; from C to D+)

The late or missed lecture penalty will be assessed on the next assignment that is due. Since things do happen, each student is allowed to either be late twice or miss one lecture without penalty. A student that misses lecture after already being late once will incur a 3% penalty on the next assignment.

If you have a graduate school or medical school interview that will cause you to miss lab, talk to me as soon as possible and definitely before you miss the lab.

I also reserve the right to prevent any student from performing a lab if I consider the student untrained due to missing certain lectures and/or successive lectures that would put the experimental animals or equipment in jeopardy.

8. Animal use

Students should be fully aware that the laboratory exercises in this course use living animals and that many of the exercises involve non-survivable surgical procedures. The animals involved in this lab include crayfish, cockroaches, frogs, and rats. Our laboratory procedures for the vertebrate animals will be in complete compliance with the codes of animal care and humane treatment established by the College and by state and federal governments. All of our laboratory procedures for vertebrates must be evaluated and approved by the College's Animal Care and Use
Committee before we can use them in a lab class. Further, the staff of this course fully subscribe to the tenet that any responsible scientist or student (or any other person, for that matter) must treat animals (both vertebrates and invertebrates) humanely and with respect.

As such it is very important for students to attend all lectures and read all required material prior to attending lab. The live preparations will only be viable for an undetermined period of time. Coming to lab prepared (understanding the surgery, what data will be collected and why, how the experiment will be performed to collect the necessary data) will allow you to conduct the experiments in the most efficient manner. This will allow you to perform the surgery faster, resulting in a more viable preparation and higher quality data. More importantly, coming unprepared for lab is very disrespectful to the animals (both vertebrates and invertebrates) since the majority of the procedures are terminal.

9. Academic integrity

Discussion among peers is an important and valuable aspect of science. However, each of you will be expected to hand in assignments individually. The assignment turned in must be an example of your own individual work. This includes both written portions and graphical presentations. The only exceptions to this are: 1) neural traces printed from your experiments; 2) data provided by the instructor who will explicitly state that the data may be shared. The same neural trace printouts may only be shared by members of the same group (i.e. no sharing of printouts between groups) unless discussed with and permitted by the instructor prior to submission.

In all other cases, students will be expected to adhere to the College of Charleston Honor System as described in the Student Handbook.

10. Lab safety Policy

Read the SSM lab safety policy I distributed in class and posted on OAKS. Pay specific attention to the sections on proper clothing (including shoes) to wear in lab. Also, note that no food or drink is allowed in the lab.
# TENTATIVE CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Week (Mon)</th>
<th>Topics</th>
<th>Lab (Wednesday)</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Review of action potentials; introduction to recording biological signals</td>
<td><em>Week 1 =</em> Further lecture material; introduction to lab equipment</td>
<td>Read lab manual</td>
</tr>
<tr>
<td>2</td>
<td>Invertebrate nervous systems; crayfish abdominal anatomy; EKGs; analysis of biological signals</td>
<td><em>Week 2 =</em> Data acquisition/software tutorial; recording and analyzing electrical activity (EKGs); introduction to microsurgery</td>
<td>EKG background Module 1 Lab worksheet Due Week 3 Wed Lecture</td>
</tr>
<tr>
<td><strong>Module 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><em>Week 3 =</em> Suction electrodes, unit identification</td>
<td><em>Week 3 =</em> Suction electrode recordings from crayfish r3s nerves controlling abdominal posture</td>
<td>Module 2 Lab worksheet Due Week 6 Mon Lecture</td>
</tr>
<tr>
<td>4</td>
<td><em>Week 4 =</em> Multiple electrode analysis, neuromodulation</td>
<td><em>Week 4 =</em> r3s data analysis; cluster analysis</td>
<td></td>
</tr>
<tr>
<td><strong>Module 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><em>Week 5 =</em> Wind-detecting cercal sensory system of cockroaches; Behavioral analysis of stimulus detection and localization</td>
<td><em>Week 5 =</em> Cockroach escape behavior</td>
<td>Complete Lab report Based on cockroach behavioral, physiological, and neuroanatomical study of the wind-escape system (not including the circuit mapping) Week 9 Mon Lecture</td>
</tr>
<tr>
<td>6</td>
<td><em>Week 6 =</em> Behavioral analysis (cont) and neurophysiological analysis of stimulus detection and localization</td>
<td><em>Week 6 =</em> Introduction to microdissection; Hook electrode recordings from cockroach wind-sensitive interneurons; directional encoding</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><em>Week 7 =</em> Tract tracing and mapping neural circuits</td>
<td><em>Week 7 =</em> Take photos of neuroanatomy; map out timing of wind-escape neural circuits</td>
<td></td>
</tr>
<tr>
<td><strong>Module 4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Stereotaxic surgery; non-invasive methods of recording brain activity</td>
<td><em>Week 8 =</em> Rat stereotaxic surgery</td>
<td>Module 4 Lab worksheet Due Week 14 Monday Lecture</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td><em>Week 9 =</em> Tissue cutting and histology</td>
<td></td>
</tr>
<tr>
<td><strong>Module 5</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Tungsten/glass microelectrodes, CNS multi-unit recordings, how brains organize information (i.e. spatial maps); sensorimotor integration</td>
<td><em>Week 10, 11 =</em> Frog tectal recordings and mapping visual space</td>
<td>Module 5 Lab worksheet Due Week 12 Friday noon</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Module 6</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Intracellular recordings; electrical stimulation; neuromodulation revisited</td>
<td><em>Week 12 =</em> intracellular recording tutorial</td>
<td>Module 6 Lab worksheet Due Week 15 Wed Lecture</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td><em>Week 13, 14 =</em> intracellular recordings from crayfish LG and other neurons</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Module 7</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Other techniques wrap-up</td>
<td>No lab</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>FINAL PRESENTATION</strong></td>
<td>During Final Exam Time</td>
<td></td>
</tr>
</tbody>
</table>
FACULTY CURRICULUM COMMITTEE
MINOR 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: Jeffrey D. Tribblehorn Phone: 843-953-5848 Email: tribblehornj@cofc.edu

School: SSM Department or Program: Biology

Name and Acronym of Minor: Neuroscience

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

☐ Add a New Minor (complete all portions)

☐ Change an Existing Minor (complete C, D, E, G, H, and I)
  ☐ Add existing course or courses to requirements or electives
  ☑ Add new course(s) to requirements or electives (attach completed course form for each)
  ☐ Delete courses from requirements or electives

☐ Terminate a Minor (complete D, G, and H)

C. GENERAL INFORMATION.

Number of Current Hours (for existing minors): 24-26
Number of Proposed Hours (for new or changing minors): 24-26

Catalog year in which changes will take effect: Fall 2014

☐ Interdisciplinary (please see guidelines on the Curriculum Committee website and include acknowledgments from relevant departments)

According to academic policy, students may not obtain a major/concentration and minor in the same subject. Will students in specific majors be prohibited from declaring this minor because of this policy?

☐ Yes—Which major(s) or concentration(s)? ____________________________

☐ No
D. RATIONALE AND EXPLANATION. Please describe the request you are making and explain why you are making it. In addition, for a new minor, please address its objectives, provide evidence of student interest (e.g. interviews with student focus groups, enrollment in special-topics courses in this area), and explain how the minor supports the liberal arts tradition as well as the mission of the institution.

I am requesting a new course entitled Techniques in Neuroscience (BIOL354) be added as an additional option for the Specialized Neuroscience Elective requirement for the current minor in Neuroscience.

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to other students with the required pre-requisites (drawing mostly from the Departments of Biology and Psychology, but potentially from the Department of Physics and Astronomy and Department of Chemistry and Biochemistry).

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time as a Special Topics in Neuroscience (BIOL446/PSYC446) this semester and has not had a significant impact on enrollment in existing courses.

In each of the three years (Spring 2011, 2012, and 2013), the course enrollment was limited to eight students. In the three years, we have had seven (Spring 2011), eight (Spring 2012), and six (Spring 2013) students enrolled in the course. I would also like to note that I had three other interested students that I could not accommodate in Spring 2012 and I have four students that have expressed interest in taking the course in Spring 2014.

E. CURRICULUM. Please attach the complete curriculum for the minor. Distinguish between required and elective courses, and note any prerequisites, co-requisites, or other restrictions. Provide the catalog description and course list exactly as they should appear in the catalog.

New course in Bold

Neuroscience Minor

Phone: 843.953.2298

Director: Elizabeth Meyer-Bernstein (Biology)
The neuroscience minor is designed to provide students with a full-spectrum approach to understanding how the brain and nervous system work in the expression of behavior. The field of neuroscience is a hybrid that integrates biology with psychology while drawing from other academic areas. This program fulfills the interdisciplinary nature of the field of neuroscience by allowing students to take neuroscience-related courses in the sciences, social sciences, and humanities in addition to core courses offered by the Departments of Biology and Psychology. In order to adequately prepare students for future careers in neuroscience-related fields, students are required to complete two semesters of independent research on a neuroscience-related topic.

Requirements
Credit Hours: 24-26
At least nine hours in the minor at the 200 level or above must be earned at the College of Charleston.

All of the following core courses:
15 credit hours

- BIOL 351/PSYC 351 Principles of Neurobiology
- BIOL 352/PSYC 352 Neurobiology and Behavior
- BIOL 447/PSYC 447 Seminar in Neuroscience
- BIOL 448/PSYC 448 Bachelor's Essay in Neuroscience (6 hours)

One of the following specialized neuroscience electives:
3 credit hours

- BIOL 354 Techniques in Neuroscience (new course proposed to include in minor)
- PSYC 356 Introduction to Behavioral Genetics
- PSYC 386 Behavioral Pharmacology
- PSYC 387 Neuropsychology
- PSYC 410 Special Topics (when content covers neuroscience, see program director)
- BIOL 353/PSYC 353 Hormones and Behavior
- BIOL 446/PSYC 446 Special Topics in Neuroscience
- PHYS 296/BIOL 396 Biophysical Modeling of Excitable Cells

Two of the following general electives (plus prerequisites):
6-8 credit hours*

*The two electives must be taken outside the declared major in order to fulfill the interdisciplinary nature of the minor.
At least one of these electives must be offered by the Department of Biology or Department of Psychology.

Anthropology (may also be used to fulfill the general education requirement)

- ANTH 333 Human Evolution
- ANTH 334 Human Variation and Adaptation
- ANTH 335 Primate Behavior and Evolution
- ANTH 342 Human Behavior and Evolution
<table>
<thead>
<tr>
<th>Biology</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 305</td>
<td>Genetics</td>
<td></td>
</tr>
<tr>
<td>BIOL 312</td>
<td>Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 313</td>
<td>Cell Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 321</td>
<td>General and Comparative Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOL 322</td>
<td>Developmental Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 343</td>
<td>Animal Behavior</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemistry</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 351</td>
<td>Biochemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 352</td>
<td>Biochemistry II</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer Science</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCL 470</td>
<td>Principles of Artificial Intelligence</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discovery Informatics</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DISC 101</td>
<td>Introduction to Discovery Informatics</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Philosophy (may also be used to fulfill the general education requirement)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 170</td>
<td>Biomedical Ethics</td>
<td></td>
</tr>
<tr>
<td>PHIL 260</td>
<td>Philosophy of Biology</td>
<td></td>
</tr>
<tr>
<td>PHIL 265</td>
<td>Philosophy of Science</td>
<td></td>
</tr>
<tr>
<td>PHIL 330</td>
<td>Philosophy of Mind</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physics</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 203</td>
<td>Physics and Medicine</td>
<td></td>
</tr>
<tr>
<td>PHYS 270</td>
<td>Nanotechnology in Medicine</td>
<td></td>
</tr>
<tr>
<td>PHYS 320</td>
<td>Introduction to Electronics</td>
<td></td>
</tr>
<tr>
<td>PHYS 230</td>
<td>Introduction to Modern Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 340</td>
<td>Photonics</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Psychology</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 215</td>
<td>Cognitive Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 221</td>
<td>Abnormal Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 216</td>
<td>Sensation and Perception</td>
<td></td>
</tr>
<tr>
<td>PSYC 317</td>
<td>Motivation</td>
<td></td>
</tr>
<tr>
<td>PSYC 318</td>
<td>Comparative Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 336</td>
<td>States of Consciousness</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Only one course from the minor can be applied towards the student's major.
**F. STUDENT LEARNING OUTCOMES AND ASSESSMENT.**

<table>
<thead>
<tr>
<th><strong>Student Learning Outcomes</strong></th>
<th><strong>Assessment Method and Performance Expected</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the minor? Attach a Curriculum Map.</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>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

How does this minor 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 minor?

**G. IMPACT ON EXISTING PROGRAMS AND COURSES.** Please describe the impact of this request on other programs and courses. If you are deleting a minor, please describe the effect on all programs that will be affected. If you are adding or changing a minor, please explain any overlap with existing programs at the College.

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.
H. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

Dr. Jeffrey D. Triblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Triblehorn’s laboratory colony.

Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

I. CHECKLIST.

X I have completed all relevant parts of the form.

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

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

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

X I have provided the complete curriculum for the minor, including the description and course list, exactly as it should appear in the catalog.
J. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:
   
   [Signature]

   Date: 2/18/13

2. Signature of Academic Dean:
   
   [Signature for MJ Auerbach]

   Date: 2/21/13

3. Signature of Provost:
   
   [Signature]

   Date: 3/7/13

4. Signature of Curriculum Committee Chair:
   
   [Signature]

   Date: ______________

5. Signature of Budget Committee Chair:

   [Signature]

   Date: ______________

6. Signature of Academic Planning Committee Chair:

   [Signature]

   Date: ______________

7. Signature of Faculty Senate Secretary:

   [Signature]

   Date: ______________

Date Approved by Faculty Senate: ___________________
FACULTY CURRICULUM COMMITTEE
MINOR 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: Jeffrey D. Tribblehorn
Phone: 843-953-5848
Email: tribblehornj@cofc.edu

School: SSM
Department or Program: Biology

Name and Acronym of Minor: Biology Minor

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

☐ Add a New Minor (complete all portions)

☐ Change an Existing Minor (complete C, D, E, G, H, and I)

☐ Add existing course or courses to requirements or electives

☐ Add new course(s) to requirements or electives (attach completed course form for each)

☐ Delete courses from requirements or electives

☐ Terminate a Minor (complete D, G, and H)

C. GENERAL INFORMATION.

Number of Current Hours (for existing minors): 24-26

Number of Proposed Hours (for new or changing minors): 24-26

Catalog year in which changes will take effect: Fall 2014

X Interdisciplinary (please see guidelines on the Curriculum Committee website and include acknowledgments from relevant departments)

According to academic policy, students may not obtain a major/concentration and minor in the same subject. Will students in specific majors be prohibited from declaring this minor because of this policy?

☐ Yes—Which major(s) or concentration(s)?

☐ No
D. RATIONALE AND EXPLANATION. Please describe the request you are making and explain why you are making it.
In addition, for a new minor, please address its objectives, provide evidence of student interest (e.g. interviews with student focus groups, enrollment in special-topics courses in this area), and explain how the minor supports the liberal arts tradition as well as the mission of the institution.

I am requesting a new course entitled Techniques in Neuroscience (BIOL354) be added as an additional option for the Specialized Neuroscience Elective requirement for the current minor in Neuroscience.

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to other students with the required pre-requisites (drawing mostly from the Departments of Biology and Psychology, but potentially from the Department of Physics and Astronomy and Department of Chemistry and Biochemistry).

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time as a Special Topics in Neuroscience (BIOL446/PSYC446) this semester and has not had a significant impact on enrollment in existing courses.

In each of the three years (Spring 2011, 2012, and 2013), the course enrollment was limited to eight students. In the three years, we have had seven (Spring 2011), eight (Spring 2012), and six (Spring 2013) students enrolled in the course. I would also like to note that I had three other interested students that I could not accommodate in Spring 2012 and I have four students that have expressed interest in taking the course in Spring 2014.
E. CURRICULUM. Please attach the complete curriculum for the minor. Distinguish between required and elective courses, and note any prerequisites, co-requisites, or other restrictions. Provide the catalog description and course list exactly as they should appear in the catalog.

Biology Minor

Credit Hours: 20

Minor Requirements:

At least nine (9) hours in the minor at the 200 level or above must be earned at the College of Charleston.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111/111L</td>
<td>Introduction to Cell and Molecular Biology (with laboratory)</td>
</tr>
<tr>
<td>BIOL 112/112L</td>
<td>Evolution, Form, and Function of Organisms (with laboratory)</td>
</tr>
<tr>
<td>BIOL 211/211D</td>
<td>Biodiversity, Ecology, and Conservation Biology</td>
</tr>
<tr>
<td>BIOL 305</td>
<td>Genetics</td>
</tr>
<tr>
<td>MATH 250</td>
<td>Statistical Methods I (or equivalent course in statistics)</td>
</tr>
</tbody>
</table>

5 additional hours in biology, with at least three (3) hours at the 300 level or above.

See course listings for a complete list of courses offered.

F. 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 minor? Attach a Curriculum Map.</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.

2.

3.

4.
How does this minor 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 minor?

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

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.

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

Dr. Jeffrey D. Triblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Triblehorn’s laboratory colony.

Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.
I. CHECKLIST.

X I have completed all relevant parts of the form.

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

X 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.

X I have provided the complete curriculum for the minor, including the description and course list, exactly as it should appear in the catalog.
J. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:

   [Signature] Date: 2/18/13

2. Signature of Academic Dean:

   [Signature] Date: 2/21/13

3. Signature of Provost:

   [Signature] Date: 3/7/13

4. Signature of Curriculum Committee Chair:

   [Signature] Date:

5. Signature of Budget Committee Chair:

   [Signature] Date:

6. Signature of Academic Planning Committee Chair:

   [Signature] Date:

7. Signature of Faculty Senate Secretary:

   [Signature] Date:

Date Approved by Faculty Senate:
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: Jeffrey D. Triblehorn
Phone: 843-953-5848
Email: triblehornj@cofc.edu

School: SSM
Department or Program: Biology

Name and Acronym of Major: Biology B.S. (BIOL)

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

X 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, emphasis, or track (Note that emphases under 18 hours will not be noted on the transcript. All concentrations, emphases, tracks, etc., with 18 hours or more are called “concentration” on the transcript.)

☐ Terminate Program (fill out C, F, G, and H)
☐ Terminate degree
☐ Terminate major
☐ Terminate emphasis, concentration, or track

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

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate
basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function, a fundamental area of biology.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to Biology students with the required pre-requisites.

D. CURRICULUM. For revised programs, please attach the complete curriculum. 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.

Biology (B.S.) Major Requirements

Degree: Bachelor of Science

Credit Hours: 65+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

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

Required Courses

**BiOL 111**  
Introduction to Cell and Molecular Biology (3) PR: None; CO: BiOL 111L

**BiOL 111L**  
Introduction to Cell and Molecular Biology Lab (1) CO: BiOL 111

OR

**HONS 151**  
Honors Biology I (3) PR: None; CO: HONS 151L

**HONS 151L**  
Honors Biology I Lab (1) CO: HONS 151

**BiOL 112**  
Evolution, Form, and Function of Organisms (3) PR: BiOL 111 and 111L; CO: BiOL 112L

**BiOL 112L**  
Evolution, Form, and Function of Organisms Lab (1) CO: BiOL 112L

OR

**HONS 152**  
Honors Biology II (3) PR: HONS 151 and 151L; CO: HONS 152L

**HONS 152L**  
Honors Biology II Lab (1) CO: HONS 152

**BiOL 211**  
Biodiversity, Ecology, and Conservation Biology (4) PR: BiOL 111 and 111L or HONS 151 and 151L and BiOL 112 and 112L or HONS 152 and 152L; CO: BiOL 211D

**BiOL 211D**  
Biodiversity, Ecology, and Conservation Biology Discussion (0) CO: BiOL 211

**BiOL 305**  
Genetics (3) PR: BiOL 111 and 111L or HONS 151 and 151L and BiOL 112 and 112L or HONS 152 and 152L; PR or CO: BiOL 211 and 211D and MATH 250 or instructor permission
Complete 19 credit hours of 300-level or above BIOL courses including at least four courses with labs from the BIOLOGY 300-LEVEL AND ABOVE ELECTIVES LIST. Note: Independent study, tutorial, Bachelor's Essay, or BIOL 450 and 451 with labs do not fulfill the lab requirement.

**BIOLOGY 300-LEVEL AND ABOVE ELECTIVES LIST**

**BIOL 300** Botany (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 301** Plant Taxonomy (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 302** Plant Anatomy (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 303** Phycology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 304** Plant Physiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of chemistry; PR or CO: BIOL 305 and MATH 250

**BIOL 305L** Genetics Lab (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D, BIOL 305 and MATH 250

**BIOL 310** General Microbiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L

**BIOL 312** Molecular Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250

**BIOL 312L** Molecular Biology Laboratory (1) PR or CO: BIOL 312 and MATH 250. Students cannot use both BIOL 412 and BIOL 312L towards their major requirements.

**BIOL 313** Cell Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L

**BIOL 313L** Cell Biology Laboratory (1) PR or CO: BIOL 313 and MATH 250

**BIOL 314** Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and one year of Chemistry; PR or CO: MATH 250

**BIOL 320** Histology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 321** General and Comparative Physiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250 or equivalent course in statistics or instructor permission

**BIOL 322** Developmental Biology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

**BIOL 323** Comparative Anatomy of Vertebrates (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 332** Vertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250
BIOL 333  Ornithology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 334  Herpetology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 335  Biology of Fishes (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 336  Parasitology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

BIOL 337  Invertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 338  Entomology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 339  Dinosaur Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 340  Zoogeography (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 341  General Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 342  Oceanography (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250; one year of college-level Math and one year of college-level Chemistry

BIOL 343  Animal Behavior (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

BIOL 350  Evolution (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

BIOL 351  Principles of Neurobiology (3) PR: PSYC 103 and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D or PSYC 214; PR or CO: MATH 250

BIOL 352  Neurobiology and Behavior (3) PR: BIOL 351 or PSYC 351 or PSYC 214; PR or CO: MATH 250

BIOL 353  Hormones and Behavior (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 354  Techniques in Neuroscience (4) PR: BIOL 351 or PSYC351 and MATH250 or PSYC211 and PSYC220 or PSYC250 and instructor permission

BIOL 357  Oceanographic Research (4) PR: BIOL 342 and instructor permission; PR or CO: MATH 250

BIOL 360  Introduction to Biometry (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 396  Biophysical Modeling of Excitable Cells (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and PHYS 111 and 111L and PHYS 112 and 112L or HONS 158 and 158L or BIOL 211 and 211D and BIOL 305 and PHYS 101 and 101L and PHYS 102 and 102L; PR or CO: MATH 250

BIOL 399  Tutorial (1-3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL; junior standing and tutor and department chair permission; PR or CO: MATH 250

BIOL 406  Conservation Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or
HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and BIOL 341 or permission of instructor; PR or CO: MATH 250

BIOL 410 Applied and Environmental Microbiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; BIOL 310 and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 411 Microtechnique and Cytochemistry (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 412 Capstone in Molecular Biology (3) PR: BIOL 111/111L or HONS 151/151L, BIOL 112/112L or HONS 152/152L, BIOL 211/211D, BIOL 305, BIOL 312, MATH 111 PR or CO: CHEM 351, MATH 250. Students cannot use both BIOL 412 and BIOL 312 towards their major requirements.

BIOL 414 Environmental Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and BIOL 312 or BIOL 313 or CHEM 351 and MATH 250

BIOL 420 General and Comparative Endocrinology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and a course in physiology or instructor permission

BIOL 421 Topics in Physiology, Cell, and Molecular Biology of Marine Organisms (3) PR: BIOL 312 or 313; BIOL 321 and instructor permission; PR or CO: MATH 250

BIOL 444 Plant Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 341 or instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 445 Systematic Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; junior standing and at least one upper division course in organismal Biology; PR or CO: MATH 250

BIOL 446 Special Topics in Neuroscience (3) PR: Junior or senior standing and instructor permission; PR or CO: MATH 250

BIOL 447 Seminar in Neuroscience (3) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352; CO: BIOL 448 or PSYC 448; PR or CO: MATH 250

BIOL 448 Bachelor's Essay in Neuroscience (6) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352 and permission of student's major department and the neuroscience program director; PR or CO: MATH 250

BIOL 449 Biology of Coral Reefs (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.0 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 450 Problems in Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 451 Problems in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 452 Seminar (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; 2.50 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed; PR or CO: BIOL 305 and MATH 250

Page 5 of 11
BIOL 453  Special Topics (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 455  Seminar in Molecular Biology (2) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305, 312 and 313; PR or CO: MATH 250

BIOL 499  Bachelor's Essay (6) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL; instructor and department chair permission; PR or CO: MATH 250

BIOL 501  Biology of the Crustacea (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 337; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 502  Special Topics in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 503  Special Topics in Ecology (3-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission, PR or CO: MATH 250

Chemistry Requirement

CHEM 111  Principles of Chemistry (3) PR or CO: unless students exempt MATH 111 (via diagnostic testing) or have completed this course as a pre-requisite, they are required to take MATH 111 as a co-requisite; CO: CHEM 111L

CHEM 111L  Principles of Chemistry Lab (1) CO: CHEM 111

CHEM 112  Principles of Chemistry (3) PR: CHEM 111 and 111L or HONS 153 and 153L; CO: CHEM 112L. (MATH 120 strongly recommended)

CHEM 112L  Principles of Chemistry Lab (1) CO: CHEM 112

CHEM 231  Organic Chemistry (3) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 231L

CHEM 231L  Introduction to Organic Chemistry Laboratory Techniques (1) CO: CHEM 231

CHEM 232  Organic Chemistry (3) PR: CHEM 231 and CHEM 231L; CO: CHEM 232L

CHEM 232L  Organic Synthesis and Analysis (1) CO: CHEM 232

Physics Requirement

PHYS 101  Introductory Physics (3) PR: None; CO: PHYS 101L

PHYS 101L  Introductory Physics Lab (1) CO: PHYS 101
AND

PHYS 102  Introductory Physics (3) PR: PHYS 101 and 101L; CO: PHYS 102L
PHYS 102L Introductory Physics Lab (1) CO: PHYS 102

OR

PHYS 111 General Physics I (3) PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L
PHYS 111L General Physics I Lab (1) CO: PHYS 111L

AND

PHYS 112 General Physics II (3) PR: PHYS 111 and 111L or HONS 157 and 157L; PR or CO: MATH 220 or equivalent or instructor permission; CO: PHYS 112L
PHYS 112L General Physics II Lab (1) CO: PHYS 112

Mathematics Requirement

MATH 120 Introductory Calculus (4) PR: MATH 111 or placement
MATH 250 Statistical Methods I (3) PR: Either MATH 111, 120 or instructor permission

Notes:

- MATH 250 is a prerequisite for all 300-level BIOL courses.
- CHEM 221 is a recommended course.
- Honors students can take the alternative sequence of HONS 191/HONS 191L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM 111/111L, CHEM 112/112L, CHEM 231/231L, and CHEM 232/CHEM 232L.
- Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS 112/112L.
### E. 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 major or program?</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. Ability to apply quantitative reasoning to biological data</td>
<td>All biology students are required to take Biology 305, Genetics. This subject material provides a good opportunity for students to apply quantitative reasoning to biological datasets. In the case of genetics, such data often are in the form of counts of offspring phenotypes that result from a planned cross. We will use a question on the final exam in Biology 305 that requires students to calculate probabilities of particular outcomes resulting from a cross and, furthermore, use statistical tests to determine if the results of an experiment are consistent with these probabilities.</td>
</tr>
<tr>
<td>2. Ability to apply the process of science</td>
<td>This learning outcome will be assessed with one or more questions on the Biology 211 final exam. These question(s) will propose a scientific question, describe the resources available to the student, and ask the student to develop a manipulative experimental design for problems that allow experimentation.</td>
</tr>
<tr>
<td>3. Ability to communicate scientific results</td>
<td>This learning outcome can also be assessed in Biology 211; in this course all students present results of some type of analysis in the form of posters and talks. Currently, the exact form of the communication (presentations, posters and/or papers) required of students varies by instructor. As a result, we propose to assess this outcome in the second year of our assessment efforts</td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>
Additional Outcomes or Comments:

1) Biology currently conducts senior surveys of all graduates (implemented in Qualtrics)

2) We are currently examining alternative approaches to use direct assessment that include multiple time points in students' careers.

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

The "hands on" high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The "hands on" high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.

G. 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.

Dr. Jeffrey D. Triblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Triblehorn's laboratory colony.
Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

H. CHECKLIST

X I have completed all relevant parts of the form.

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

X 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.

X 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. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: 2/18/13

2. Signature of Academic Dean:

   [Signature]

   Date: 2/21/13

3. Signature of Provost:

   [Signature]

   Date: 3/7/13

4. Signature of Curriculum Committee Chair:

   ________________________

   Date: _________________

5. Signature of Budget Committee Chair:

   ________________________

   Date: _________________

6. Signature of Academic Planning Committee Chair:

   ________________________

   Date: _________________
7. Signature of Faculty Senate Secretary:

______________________________ Date: ________________

Date Approved by Faculty Senate: ____________________
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: Jeffrey D. Triblehorn  Phone: 843-953-5848  Email: triblehornj@cofc.edu

School: SSM  Department or Program: Biology

Name and Acronym of Major: Marine Biology B.S. (BIOL)

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

X 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, emphasis, or track (Note that emphases under 18 hours will not be noted on the transcript. All concentrations, emphases, tracks, etc., with 18 hours or more are called “concentration” on the transcript.)

☐ Terminate Program (fill out C, F, G, and H)
- Terminate degree
- Terminate major
- Terminate emphasis, concentration, or track

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

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate
basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function, which includes marine animals.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to Marine Biology students with the required pre-requisites.

D. CURRICULUM. For revised programs, please attach the complete curriculum. 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.

New course in Bold

Marine Biology Major Requirements

Degree: Bachelor of Science

Credit Hours: 64+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

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

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>PR</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Introduction to Cell and Molecular Biology</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 111L</td>
<td>Introduction to Cell and Molecular Biology Lab</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>HONS 151 Honors Biology I</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>HONS 151L Honors Biology I Lab</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 112</td>
<td>Evolution, Form, and Function of Organisms</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 112L</td>
<td>Evolution, Form, and Function of Organisms Lab</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>HONS 152 Honors Biology II</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>HONS 152L Honors Biology II Lab</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Biodiversity, Ecology, and Conservation Biology</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 211D</td>
<td>Biodiversity, Ecology, and Conservation Biology Discussion</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 305</td>
<td>Genetics</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BIOL 335  Biology of Fishes (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 337  Invertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 341  General Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 342  Oceanography (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250; one year of college-level Math and one year of college-level Chemistry

Complete 3 credit hours of 300-level or above Biology courses from the BIOLOGY 300-LEVEL AND ABOVE ELECTIVES LIST.

BIOLOGY 300-LEVEL AND ABOVE ELECTIVES LIST

BIOL 300  Botany (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 301  Plant Taxonomy (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 302  Plant Anatomy (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 303  Phycology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 304  Plant Physiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 305L  Genetics Lab (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D, BIOL 305 and MATH 250

BIOL 310  General Microbiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L

BIOL 312  Molecular Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250

BIOL 312L  Molecular Biology Laboratory (1) PR or CO: BIOL 312 and MATH 250. Students cannot use both BIOL 412 and BIOL 312L towards their major requirements.

BIOL 313  Cell Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 313L</td>
<td>Cell Biology Laboratory (I) PR or CO: BIOL 313 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 314</td>
<td>Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and one year of Chemistry; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 320</td>
<td>Histology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 321</td>
<td>General and Comparative Physiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250 or equivalent course in statistics or instructor permission</td>
<td></td>
</tr>
<tr>
<td>BIOL 322</td>
<td>Developmental Biology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 323</td>
<td>Comparative Anatomy of Vertebrates (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 332</td>
<td>Vertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 333</td>
<td>Ornithology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 334</td>
<td>Herpetology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 336</td>
<td>Parasitology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 338</td>
<td>Entomology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 339</td>
<td>Dinosaur Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 340</td>
<td>Zoogeography (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 343</td>
<td>Animal Behavior (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 350</td>
<td>Evolution (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 351</td>
<td>Principles of Neurobiology (3) PR: PSYC 103 and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D or PSYC 214; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 352</td>
<td>Neurobiology and Behavior (3) PR: BIOL 351 or PSYC 351 or PSYC 214; PR or CO: MATH 250</td>
<td></td>
</tr>
<tr>
<td>BIOL 353</td>
<td>Hormones and Behavior (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL</td>
<td></td>
</tr>
</tbody>
</table>
BIOL 354  Techniques in Neuroscience (4) PR: BIOL 351 or PSYC351 and MATH250 or PSYC211 and PSYC220 or PSYC250 and instructor permission

BIOL 360  Introduction to Biometry (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 396  Biophysical Modeling of Excitable Cells (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and PHYS 111 and 111L and PHYS 112 and 112L or HONS 158 and 158L or BIOL 211 and 211D and BIOL 305 and PHYS 101 and 101L and PHYS 102 and 102L; PR or CO: MATH 250

BIOL 399  Tutorial (1-3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL; junior standing and tutor and department chair permission; PR or CO: MATH 250

BIOL 406  Conservation Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and BIOL 341 or permission of instructor; PR or CO: MATH 250

BIOL 410  Applied and Environmental Microbiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; BIOL 310 and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 411  Microtechnique and Cytochemistry (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 412  Capstone in Molecular Biology (3) PR: BIOL 111/111L or HONS 151/151L, BIOL 112/112L or HONS 152/152L, BIOL 211/211D, BIOL 305, BIOL 312, MATH 111 PR or CO: CHEM 351, MATH 250. Students cannot use both BIOL 412 and BIOL 312L towards their major requirements.

BIOL 414  Environmental Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and BIOL 312 or BIOL 313 or CHEM 351 and MATH 250

BIOL 420  General and Comparative Endocrinology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250 and a course in physiology or instructor permission

BIOL 421  Topics in Physiology, Cell, and Molecular Biology of Marine Organisms (3) PR: BIOL 312 or 313; BIOL 321 and instructor permission; PR or CO: MATH 250

BIOL 444  Plant Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 341 or instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 445  Systematic Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; junior standing and at least one upper division course in organismal Biology; PR or CO: MATH 250

BIOL 446  Special Topics in Neuroscience (3) PR: Junior or senior standing and instructor permission; PR or CO: MATH 250
BIOL 447  Seminar in Neuroscience (3) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352; CO: BIOL 448 or PSYC 448; PR or CO: MATH 250

BIOL 448  Bachelor's Essay in Neuroscience (6) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352 and permission of student's major department and the neuroscience program director; PR or CO: MATH 250

BIOL 449  Biology of Coral Reefs (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.00 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 450  Problems in Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 451  Problems in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 452  Seminar (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; 2.50 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed; PR or CO: BIOL 305 and MATH 250

BIOL 453  Special Topics (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 455  Seminar in Molecular Biology (2) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305, 312 and 313; PR or CO: MATH 250

BIOL 499  Bachelor's Essay (6) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL; instructor and department chair permission; PR or CO: MATH 250

BIOL 501  Biology of the Crustacea (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 337; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 502  Special Topics in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 503  Special Topics in Ecology (3-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

Chemistry Requirement

CHEM 111  Principles of Chemistry (3) PR or CO: unless students exempt MATH 111 (via diagnostic testing) or have completed this course as a pre-requisite, they are required to take MATH
CHEM 111L Principles of Chemistry Lab (1) CO: CHEM 111
AND
CHEM 112 Principles of Chemistry (3) PR: CHEM 111 and 111L or HONS 153 and 153L; CO: CHEM 112L (MATH 120 strongly recommended)
CHEM 112L Principles of Chemistry Lab (1) CO: CHEM 112
AND
CHEM 221 Quantitative Analysis (4) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 221L
OR
CHEM 231 Organic Chemistry (3) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 231L
CHEM 231L Introduction to Organic Chemistry Laboratory Techniques (1) CO: CHEM 231
AND
CHEM 232 Organic Chemistry (3) PR: CHEM 231 and CHEM 231L; CO: CHEM 232L
CHEM 232L Organic Synthesis and Analysis (1) CO: CHEM 232

Physics Requirement

PHYS 101 Introductory Physics I (3) PR: None; CO: PHYS 101L
PHYS 101L Introductory Physics Lab (1) CO: PHYS 101
AND
PHYS 102 Introductory Physics II (3) PR: PHYS 101 and 101L; CO: PHYS 102L
PHYS 102L Introductory Physics Lab (1) CO: PHYS 102
OR

PHYS 111 General Physics I (3) PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L
PHYS 111L General Physics I Lab (1) CO: PHYS 111L
AND
PHYS 112 General Physics II (3) PR: PHYS 111 and 111L or HONS 157 and 157L; PR or CO: MATH 220 or equivalent or instructor permission; CO: PHYS 112L
PHYS 112L General Physics II Lab (1) CO: PHYS 112

Mathematics Requirement

MATH 120 Introductory Calculus (4) PR: MATH 111 or placement
MATH 250  Statistical Methods I (3) PR: Either MATH 111, 120 or instructor permission

Complete one of the following Geology courses:

GEOL 101  Dynamic Earth (3) PR: None; CO: GEOL 101L
GEOL 101L  Dynamic Earth Lab (1) CO: GEOL 101

GEOL 103  Environmental Geology (3) PR: None; CO: GEOL 103L
GEOL 103L  Environmental Geology Lab (1) CO: GEOL 103

GEOL 107*  Introduction to Coastal and Marine Geology (3) PR: None.

Note: *This course may not be used to fulfill natural science general education or Geology major requirements. Students may not receive credit for both GEOL 107 and 257. This course is recommended for Marine Biology majors.

Notes:

- MATH 250 is a prerequisite for all 300-level BIOL courses.
- CHEM 221 is a recommended course.
- Honors students can take the alternative sequence of HONS 191/HONS 191L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM 111/111L, CHEM 112/112L, CHEM 231/231L, and CHEM 232/CHEM 232L.
- Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS 112/112L.
### E. 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 major or program?</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. Ability to apply quantitative reasoning to biological data</td>
<td>All biology students are required to take Biology 305, Genetics. This subject material provides a good opportunity for students to apply quantitative reasoning to biological datasets. In the case of genetics, such data often are in the form of counts of offspring phenotypes that result from a planned cross. We will use a question on the final exam in Biology 305 that requires students to calculate probabilities of particular outcomes resulting from a cross and, furthermore, use statistical tests to determine if the results of an experiment are consistent with these probabilities.</td>
</tr>
<tr>
<td>2. Ability to apply the process of science</td>
<td>This learning outcome will be assessed with one or more questions on the Biology 211 final exam. These question(s) will propose a scientific question, describe the resources available to the student, and ask the student to develop a manipulative experimental design for problems that allow experimentation.</td>
</tr>
<tr>
<td>3. Ability to communicate scientific results</td>
<td>This learning outcome can also be assessed in Biology 211; in this course all students present results of some type of analysis in the form of posters and talks. Currently, the exact form of the communication (presentations, posters and/or papers) required of students varies by instructor. As a result, we propose to assess this outcome in the second year of our assessment efforts</td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>
Additional Outcomes or Comments:

1) Biology currently conducts senior surveys of all graduates (implemented in Qualtrics)

2) We are currently examining alternative approaches to use direct assessment that include multiple time points in students' careers.

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

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.

G. 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.

Dr. Jeffrey D. Tribblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Tribblehorn’s laboratory colony.
Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

H. CHECKLIST

X I have completed all relevant parts of the form.

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

X 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.

X 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. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: 2/18/13

2. Signature of Academic Dean:

   [Signature]

   Date: 2/21/13

3. Signature of Provost:

   [Signature]

   Date: 3/7/13

4. Signature of Curriculum Committee Chair:

   [Signature]

   Date: 

5. Signature of Budget Committee Chair:

   [Signature]

   Date: 

Page 11 of 12
6. Signature of Academic Planning Committee Chair:

__________________________________________ Date: _______________________

7. Signature of Faculty Senate Secretary:

__________________________________________ Date: _______________________

Date Approved by Faculty Senate: ________________________
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: Jeffrey D. Triblehorn  Phone: 843-953-5848  Email: triblehornj@cofc.edu
School: SSM  Department or Program: Biology
Name and Acronym of Major: Biology B.S. with Concentration in Molecular Biology (BIOL)

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

X 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, emphasis, or track (Note that emphases under 18 hours will not be noted on the transcript. All concentrations, emphases, tracks, etc., with 18 hours or more are called “concentration” on the transcript.)

□ Terminate Program (fill out C, F, G, and H)
- □ Terminate degree
- □ Terminate major
- □ Terminate emphasis, concentration, or track

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

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior.
substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function, a fundamental area of biology including molecular biology (i.e. cellular and molecular neuroscience).

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to Biology students with the required pre-requisites.

D. CURRICULUM. For revised programs, please attach the complete curriculum. 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.

New course in bold.

Biology Major with Concentration in Molecular Biology Requirements

Degree: Bachelor of Science

Credit Hours: 72+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

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

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>PR/CO Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Introduction to Cell and Molecular Biology</td>
<td>None; CO: BIOL 111L</td>
</tr>
<tr>
<td>BIOL 111L</td>
<td>Introduction to Cell and Molecular Biology Lab</td>
<td>(1) CO: BIOL 111</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HONS 151</td>
<td>Honors Biology I (3) PR: None; CO: HONS 151L</td>
<td></td>
</tr>
<tr>
<td>HONS 151L</td>
<td>Honors Biology I Lab (1) CO: HONS 151</td>
<td></td>
</tr>
<tr>
<td>BIOL 112</td>
<td>Evolution, Form, and Function of Organisms</td>
<td>(3) PR: BIOL 111 and 111L; CO: BIOL 112L</td>
</tr>
<tr>
<td>BIOL 112L</td>
<td>Evolution, Form, and Function of Organisms Lab</td>
<td>(1) CO: BIOL 112L</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HONS 152</td>
<td>Honors Biology II (3) PR: HONS 151 and 151L; CO: HONS 152L</td>
<td></td>
</tr>
<tr>
<td>HONS 152L</td>
<td>Honors Biology II Lab (1) CO: HONS 152</td>
<td></td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Biodiversity, Ecology, and Conservation Biology</td>
<td>(4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; CO: BIOL 211D</td>
</tr>
<tr>
<td>BIOL 211D</td>
<td>Biodiversity, Ecology, and Conservation Biology Discussion</td>
<td>(0) CO: BIOL 211</td>
</tr>
<tr>
<td>BIOL 305</td>
<td>Genetics (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D and MATH 250 or instructor permission</td>
<td></td>
</tr>
</tbody>
</table>
BIOL 305L  Genetics Lab (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D, BIOL 305 and MATH 250

BIOL 312  Molecular Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250

BIOL 313  Cell Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L

BIOL 313L  Cell Biology Laboratory (1) PR or CO: BIOL 313 and MATH 250

BIOL 412  Capstone in Molecular Biology (3) PR: BIOL 111/111L or HONS 151/151L, BIOL 112/112L or HONS 152/152L, BIOL 211/211D, BIOL 305, BIOL 312, MATH 111 PR or CO: CHEM 351, MATH 250. Students cannot choose both BIOL 412 and BIOL 312L towards their major requirements.

Complete 8 credit hours of 300-level or above BIOL courses from the BIOLOGY 300-LEVEL AND ABOVE ELECTIVES LIST for a total of four courses with labs (independent study, tutorial, Bachelor's Essay, or BIOL 450 and 451 with labs do not fulfill the lab requirement).

**BIOLOGY 300-LEVEL AND ABOVE ELECTIVES LIST**

**BIOL 300**  Botany (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 301**  Plant Taxonomy (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 302**  Plant Anatomy (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 303**  Phycology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 304**  Plant Physiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of chemistry; PR or CO: BIOL 305 and MATH 250

**BIOL 310**  General Microbiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L

**BIOL 314**  Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and one year of Chemistry; PR or CO: MATH 250

**BIOL 320**  Histology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 321**  General and Comparative Physiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL
211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250 or equivalent course in statistics or instructor permission

**BIOL 322**

Developmental Biology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

**BIOL 323**

Comparative Anatomy of Vertebrates (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 332**

Vertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 333**

Ornithology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 334**

Herpetology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 335**

Biology of Fishes (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 336**

Parasitology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

**BIOL 337**

Invertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 338**

Entomology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 339**

Dinosaur Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 340**

Zoogeography (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 341**

General Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**BIOL 342**

Oceanography (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250; one year of college-level Math and one year of college-level Chemistry

**BIOL 343**

Animal Behavior (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

**BIOL 350**

Evolution (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

**BIOL 351**

Principles of Neurobiology (3) PR: PSYC 103 and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D or PSYC
214; PR or CO: MATH 250

BIOL 352  Neurobiology and Behavior (3) PR: BIOL 351 or PSYC 351 or PSYC 214; PR or CO: MATH 250

BIOL 353  Hormones and Behavior (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 354  Techniques in Neuroscience (4) PR: BIOL 351 or PSYC351 and MATH250 or PSYC211 and PSYC220 or PSYC250 and instructor permission

BIOL 357  Oceanographic Research (4) PR: BIOL 342 and instructor permission; PR or CO: MATH 250

BIOL 360  Introduction to Biometry (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

BIOL 396  Biophysical Modeling of Excitable Cells (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and PHYS 111 and 111L and PHYS 112 and 112L or HONS 158 and 158L or BIOL 211 and 211D and BIOL 305 and PHYS 101 and 101L and PHYS 102 and 102L; PR or CO: MATH 250

BIOL 399  Tutorial (1-3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL; junior standing and tutor and department chair permission; PR or CO: MATH 250

BIOL 406  Conservation Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and BIOL 341 or permission of instructor; PR or CO: MATH 250

BIOL 410  Applied and Environmental Microbiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; BIOL 310 and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 411  Microtechnique and Cytochemistry (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 414  Environmental Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and BIOL 312 or BIOL 313 or CHEM 351 and MATH 250

BIOL 420  General and Comparative Endocrinology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250 and a course in physiology or instructor permission

BIOL 421  Topics in Physiology, Cell, and Molecular Biology of Marine Organisms (3) PR: BIOL 312 or 313; BIOL 321 and instructor permission; PR or CO: MATH 250

BIOL 444  Plant Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 341 or instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 445  Systematic Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; junior standing and at least one upper division course in organismal Biology; PR or CO: MATH 250
BIOL 446  Special Topics in Neuroscience (3) PR: Junior or senior standing and instructor permission; PR or CO: MATH 250

BIOL 447  Seminar in Neuroscience (3) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352; CO: BIOL 448 or PSYC 448; PR or CO: MATH 250

BIOL 448  Bachelor's Essay in Neuroscience (6) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352 and permission of student's major department and the neuroscience program director; PR or CO: MATH 250

BIOL 449  Biology of Coral Reefs (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.00 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 450  Problems in Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 451  Problems in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 452  Seminar (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; 2.50 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed; PR or CO: BIOL 305 and MATH 250

BIOL 453  Special Topics (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 499  Bachelor's Essay (6) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL; instructor and department chair permission; PR or CO: MATH 250

BIOL 501  Biology of the Crustacea (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 337; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 502  Special Topics in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 503  Special Topics in Ecology (3-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.00 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

Chemistry Requirement

CHEM 111  Principles of Chemistry (3) PR or CO: unless students exempt MATH 111 (via diagnostic testing) or have completed this course as a pre-requisite, they are required to take MATH 111 as a co-requisite; CO: CHEM 111L
CHEM 111L  Principles of Chemistry Lab (1) CO: CHEM 111
CHEM 112  Principles of Chemistry (3) PR: CHEM 111 and 111L or HONS 153 and 153L; CO: CHEM 112L (MATH 120 strongly recommended)
CHEM 112L  Principles of Chemistry Lab (1) CO: CHEM 112
CHEM 231  Organic Chemistry (3) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 231L
CHEM 231L  Introduction to Organic Chemistry Laboratory Techniques (1) CO: CHEM 231
CHEM 232  Organic Chemistry (3) PR: CHEM 231 and CHEM 231L; CO: CHEM 232L
CHEM 232L  Organic Synthesis and Analysis (1) CO: CHEM 232
CHEM 351  Biochemistry (3) PR: CHEM 232, CHEM 232L
CHEM 352  Biochemistry II (3) PR: CHEM 351
CHEM 354L  Biochemistry II Laboratory (1) PR: CHEM 351

Physics Requirement

PHYS 101  Introductory Physics (3) PR: None; CO: PHYS 101L
PHYS 101L  Introductory Physics Lab (1) CO: PHYS 101
AND
PHYS 102  Introductory Physics (3) PR: PHYS 101 and 101L; CO: PHYS 102L
PHYS 102L  Introductory Physics Lab (1) CO: PHYS 102
OR

PHYS 111  General Physics I (3) PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L
PHYS 111L  General Physics I Lab (1) CO: PHYS 111L
AND
PHYS 112  General Physics II (3) PR: PHYS 111 and 111L or HONS 157 and 157L; PR or CO: MATH 220 or equivalent or instructor permission; CO: PHYS 112L
PHYS 112L  General Physics II Lab (1) CO: PHYS 112

Mathematics Requirement

MATH 120  Introductory Calculus (4) PR: MATH 111 or placement
MATH 250  Statistical Methods I (3) PR: Either MATH 111, 120 or instructor permission

Notes:

- MATH 250 is a prerequisite for all 300-level BIOL courses.
• CHEM 221 is a recommended course.

• Honors students can take the alternative sequence of HONS 191/HONS 191L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM 111/111L, CHEM 112/112L, CHEM 231/231L, and CHEM 232/CHEM 232L.

• Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS 112/112L.
### Student Learning Outcomes

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

### Assessment Method and Performance Expected

<table>
<thead>
<tr>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<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. **Ability to apply quantitative reasoning to biological data**

   All biology students are required to take Biology 305, Genetics. This subject material provides a good opportunity for students to apply quantitative reasoning to biological datasets. In the case of genetics, such data often are in the form of counts of offspring phenotypes that result from a planned cross. We will use a question on the final exam in Biology 305 that requires students to calculate probabilities of particular outcomes resulting from a cross and, furthermore, use statistical tests to determine if the results of an experiment are consistent with these probabilities.

2. **Ability to apply the process of science**

   This learning outcome will be assessed with one or more questions on the Biology 211 final exam. These question(s) will propose a scientific question, describe the resources available to the student, and ask the student to develop a manipulative experimental design for problems that allow experimentation.

3. **Ability to communicate scientific results**

   This learning outcome can also be assessed in Biology 211; in this course all students present results of some type of analysis in the form of posters and talks. Currently, the exact form of the communication (presentations, posters and/or papers) required of students varies by instructor. As a result, we propose to assess this outcome in the second year of our assessment efforts.

4. |

---

Page 9 of 12
F. IMPACT ON EXISTING PROGRAMS AND COURSES. Please describe the impact of this request on other programs and courses. If you are deleting a minor, please describe the effect on all programs that will be impacted; if you are adding or changing a minor, please explain any overlap with existing programs at the College.

The "hands on" high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience).

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The "hands on" high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.

G. 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.

Dr. Jeffrey D. Tribblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Tribblehorn's laboratory colony.
Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

H. CHECKLIST

X 1 have completed all relevant parts of the form.

X 1 have attached a cover letter that describes my request and lists all the documents I am submitting.

X 1 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.

X 1 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. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

[Signature] Date: 2/18/13

2. Signature of Academic Dean:

[Signature for MJ Auerbach] Date: 2/21/13

3. Signature of Provost:

[Signature] Date: 3/7/13

4. Signature of Curriculum Committee Chair:

[Signature] Date: 

5. Signature of Budget Committee Chair:

[Signature] Date: 

6. Signature of Academic Planning Committee Chair:
7. Signature of Faculty Senate Secretary:

Date: ______________________

Date Approved by Faculty Senate: ______________________
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: Jeffrey D. Triblehorn  Phone: 843-953-5848  Email: triblehornj@cofc.edu

School: SSM  Department or Program: Biology

Name and Acronym of Major: Biology B.A. (BIOL)

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

X Change Request (fill out all sections)
- [ ] Add an existing course to requirements or electives
- X Add a new course to requirements or electives (attach completed course form for each)
- [ ] Delete courses from requirements or electives
- [ ] Add or modify concentration, emphasis, or track (Note that emphases under 18 hours will not be noted on the transcript. All concentrations, emphases, tracks, etc., with 18 hours or more are called “concentration” on the transcript.)

[ ] Terminate Program (fill out C, F, G, and H)
- [ ] Terminate degree
- [ ] Terminate major
- [ ] Terminate emphasis, concentration, or track

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

Techniques in Neuroscience is an intensive "hands on" laboratory course that exposes students to a variety of neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology), microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate...
basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function, a fundamental area of biology.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to Biology students with the required pre-requisites.

D. CURRICULUM. For revised programs, please attach the complete curriculum. 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. New course in **bold**

**Biology (B.A.) Major Requirements**

**Degree:** Bachelor of Arts

**Credit Hours:** 39+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

Courses within this major may also satisfy general education requirements. Please consult [http://advising.cofc.edu/general-edu](http://advising.cofc.edu/general-edu) for more information.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Introduction to Cell and Molecular Biology</td>
<td>3</td>
<td>None</td>
<td>CO: BIOL 111L</td>
</tr>
<tr>
<td>BIOL 111L</td>
<td>Introduction to Cell and Molecular Biology Lab</td>
<td>1</td>
<td>CO: BIOL 111</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HONS 151</td>
<td>Honors Biology I</td>
<td>3</td>
<td>None</td>
<td>CO: HONS 151L</td>
</tr>
<tr>
<td>HONS 151L</td>
<td>Honors Biology I Lab</td>
<td>1</td>
<td>CO: HONS 151</td>
<td></td>
</tr>
<tr>
<td>BIOL 112</td>
<td>Evolution, Form, and Function of Organisms</td>
<td>3</td>
<td>BIOL 111 and 111L</td>
<td>CO: BIOL 112L</td>
</tr>
<tr>
<td>BIOL 112L</td>
<td>Evolution, Form, and Function of Organisms Lab</td>
<td>1</td>
<td>CO: BIOL 112</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HONS 152</td>
<td>Honors Biology II</td>
<td>3</td>
<td>HONS 151 and 151L</td>
<td>CO: HONS 152L</td>
</tr>
<tr>
<td>HONS 152L</td>
<td>Honors Biology II Lab</td>
<td>1</td>
<td>CO: HONS 152</td>
<td></td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Biodiversity, Ecology, and Conservation Biology</td>
<td>4</td>
<td>BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L</td>
<td>CO: BIOL 211D</td>
</tr>
<tr>
<td>BIOL 211D</td>
<td>Biodiversity, Ecology, and Conservation Biology Discussion</td>
<td>0</td>
<td>CO: BIOL 211</td>
<td></td>
</tr>
<tr>
<td>BIOL 305</td>
<td>Genetics</td>
<td>3</td>
<td>BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L</td>
<td>PR or CO: BIOL 211 and 211D and MATH 250 or instructor permission</td>
</tr>
</tbody>
</table>
Complete 13 credit hours of BIOL courses from the following, including 9 credit hours at the 300-level or above; three courses must be taken with labs; two of the courses with labs must be at the 300-level or above. Labs may carry separate credit or be part of a 4 credit course. (Independent study, tutorial, Bachelor’s Essay, or BIOL 450 and 451 with labs do not fulfill the lab requirement).

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 201</td>
<td>Human Physiology (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L.</td>
</tr>
<tr>
<td>BIOL 202</td>
<td>Human Anatomy (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L.</td>
</tr>
<tr>
<td>BIOL 204</td>
<td>Man and the Environment (3)</td>
<td>PR: None</td>
</tr>
<tr>
<td>BIOL 209</td>
<td>Marine Biology (4)</td>
<td>PR: None</td>
</tr>
<tr>
<td>BIOL 250</td>
<td>Special Topics in Biology (1-4)</td>
<td>PR: One year of biology or instructor permission</td>
</tr>
<tr>
<td>BIOL 300</td>
<td>Botany (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 301</td>
<td>Plant Taxonomy (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 302</td>
<td>Plant Anatomy (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 303</td>
<td>Phycolgy (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 304</td>
<td>Plant Physiology (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of chemistry; PR or CO: BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 305L</td>
<td>Genetics Lab (1)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D, BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 310</td>
<td>General Microbiology (4)</td>
<td>PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L.</td>
</tr>
<tr>
<td>BIOL 312</td>
<td>Molecular Biology (3)</td>
<td>PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250</td>
</tr>
<tr>
<td>BIOL 312L</td>
<td>Molecular Biology Laboratory (1)</td>
<td>PR or CO: BIOL 312 and MATH 250. Students cannot use both BIOL 412 and BIOL 312L towards their major requirements.</td>
</tr>
<tr>
<td>BIOL 313</td>
<td>Cell Biology (3)</td>
<td>PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L.</td>
</tr>
<tr>
<td>BIOL 313L</td>
<td>Cell Biology Laboratory (1)</td>
<td>PR or CO: BIOL 313 and MATH 250</td>
</tr>
<tr>
<td>BIOL 314</td>
<td>Immunology (3)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and one year of Chemistry; PR or CO: MATH 250</td>
</tr>
<tr>
<td>BIOL 320</td>
<td>Histology (4)</td>
<td>PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250</td>
</tr>
<tr>
<td>BIOL 321</td>
<td>General and Comparative Physiology (4)</td>
<td>PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250 or equivalent course in statistics or instructor permission</td>
</tr>
</tbody>
</table>
and 158L or BIOL 211 and 211D and BIOL 305 and PHYS 101 and 101L and PHYS 102 and 102L; PR or CO: MATH 250

BIOL 399 Tutorial (1-3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.000 GPA or higher in BIOL; junior standing and department chair permission; PR or CO: MATH 250

BIOL 406 Conservation Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and BIOL 341 or permission of instructor; PR or CO: MATH 250

BIOL 410 Applied and Environmental Microbiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; BIOL 310 and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 411 Microtechnique and Cytochemistry (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 412 Capstone in Molecular Biology (3) PR: BIOL 111/111L or HONS 151/151L, BIOL 112/112L or HONS 152/152L, BIOL 211/211D, BIOL 305, BIOL 312, MATH 111 PR or CO: CHEM 351, MATH 250. Students cannot use both BIOL 412 and BIOL 312L towards their major requirements.

BIOL 414 Environmental Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of Chemistry; PR or CO: BIOL 305 and BIOL 312 or BIOL 313 or CHEM 351 and MATH 250

BIOL 420 General and Comparative Endocrinology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250 and a course in physiology or instructor permission

BIOL 421 Topics in Physiology, Cell, and Molecular Biology of Marine Organisms (3) PR: BIOL 312 or 313; BIOL 321 and instructor permission; PR or CO: MATH 250

BIOL 444 Plant Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 341 or instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 445 Systematic Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; junior standing and at least one upper division course in organismal Biology; PR or CO: MATH 250

BIOL 446 Special Topics in Neuroscience (3) PR: Junior or senior standing and instructor permission; PR or CO: MATH 250

BIOL 447 Seminar in Neuroscience (3) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352; CO: BIOL 448 or PSYC 448; PR or CO: MATH 250

BIOL 448 Bachelor's Essay in Neuroscience (6) PR: BIOL 351 or PSYC 351 and BIOL 352 or PSYC 352 and permission of student's major department and the neuroscience program director; PR or CO: MATH 250

BIOL 449 Biology of Coral Reefs (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.000 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 450 Problems in Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.000 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250
BIOL 451  Problems in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.000 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 452  Seminar (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; 2.500 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed; PR or CO: BIOL 305 and MATH 250

BIOL 453  Special Topics (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and instructor permission; PR or CO: BIOL 305 and MATH 250

BIOL 455  Seminar in Molecular Biology (2) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305, 312 and 313, PR or CO: MATH 250

BIOL 499  Bachelor's Essay (6) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.000 GPA or higher in BIOL; instructor and department chair permission; PR or CO: MATH 250

BIOL 501  Biology of the Crustacea (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 337; 3.000 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 502  Special Topics in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.000 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

BIOL 503  Special Topics in Ecology (3-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112L and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and 341; 3.000 GPA or higher in BIOL and junior standing and 15 credit hours of BIOL completed or instructor and department chair permission; PR or CO: MATH 250

Chemistry Requirement

CHEM 101  General Chemistry (3) PR: None; CO: CHEM 101L

CHEM 101L  General Chemistry Lab (1) CO: CHEM 101

AND

CHEM 102  Organic and Biological Chemistry (3) PR: CHEM 101 and 101L or CHEM 111 and 111L; CO: CHEM 102L

CHEM 102L  Organic and Biological Chemistry Lab (1) CO: CHEM 102

OR

CHEM 111  Principles of Chemistry (3) PR or CO: unless students exempt MATH 111 (via diagnostic testing) or have completed this course as a pre-requisite, they are required to take MATH 111 as a co-requisite; CO: CHEM 111L

CHEM 111L  Principles of Chemistry Lab (1) CO: CHEM 111

AND

Page 6 of 11
CHEM 112  Principles of Chemistry (3) PR: CHEM 111 and 111L or HONS 153 and 153L; CO: CHEM 112L (MATH 120 strongly recommended)
CHEM 112L Principles of Chemistry Lab (1) CO: CHEM 112

Mathematics Requirement

MATH 250  Statistical Methods I (3) PR: Either MATH 111, 120 or instructor permission

Notes:

- MATH 250 is a prerequisite for all 300-level BIOL courses.
- CHEM 221 is a recommended course.
- Honors students can take the alternative sequence of HONS 191/HONS 191L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM 111/111L, CHEM 112/112L, CHEM 231/231L, and CHEM 232/CHEM 232L.
- Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS 112/112L.
### Student Learning Outcomes

What will students know and be able to do when they complete the major or program?

### Assessment Method and Performance Expected

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?

| 1. Ability to apply quantitative reasoning to biological data | All biology students are required to take Biology 305, Genetics. This subject material provides a good opportunity for students to apply quantitative reasoning to biological datasets. In the case of genetics, such data often are in the form of counts of offspring phenotypes that result from a planned cross. We will use a question on the final exam in Biology 305 that requires students to calculate probabilities of particular outcomes resulting from a cross and, furthermore, use statistical tests to determine if the results of an experiment are consistent with these probabilities. |
| 2. Ability to apply the process of science | This learning outcome will be assessed with one or more questions on the Biology 211 final exam. These question(s) will propose a scientific question, describe the resources available to the student, and ask the student to develop a manipulative experimental design for problems that allow experimentation. |
| 3. Ability to communicate scientific results | This learning outcome can also be assessed in Biology 211; in this course all students present results of some type of analysis in the form of posters and talks. Currently, the exact form of the communication (presentations, posters and/or papers) required of students varies by instructor. As a result, we propose to assess this outcome in the second year of our assessment efforts |

| 4. | |
F. IMPACT ON EXISTING PROGRAMS AND COURSES. Please describe the impact of this request on other programs and courses. If you are deleting a minor, please describe the effect on all programs that will be impacted; if you are adding or changing a minor, please explain any overlap with existing programs at the College.

The "hands on" high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The "hands on" high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.

G. 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.

Dr. Jeffrey D. Triblehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e. equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Triblehorn's laboratory colony.
Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

H. CHECKLIST

X I have completed all relevant parts of the form.

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

X 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.

X 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. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: 2/18/13

2. Signature of Academic Dean:

   [Signature]

   Date: 2/2/13

3. Signature of Provost:

   [Signature]

   Date: 3/7/13

4. Signature of Curriculum Committee Chair:

   [Signature]

   Date: ___________________

5. Signature of Budget Committee Chair:

   [Signature]

   Date: ___________________

6. Signature of Academic Planning Committee Chair:

   [Signature]
7. Signature of Faculty Senate Secretary:

______________________________  Date: ______________________

Date Approved by Faculty Senate: ______________________
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: Jeffrey D. Triblehorn
Phone: 843-953-5848
Email: triblehornj@cofc.edu

School: SSM
Department or Program: Biology

Name and Acronym of Major: Biology Major Teaching Option (B.S)

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

X Change Request (fill out all sections)
☐ Add an existing course to requirements or electives
X Add a new course to requirements or electives (attach completed course form for each)
☐ Delete courses from requirements or electives
☐ Add or modify concentration, emphasis, or track (Note that emphases under 18 hours will not be noted on the
transcript. All concentrations, emphases, tracks, etc., with 18 hours or more are called “concentration” on the
transcript.)

☐ Terminate Program (fill out C, F, G, and H)
☐ Terminate degree
☐ Terminate major
☐ Terminate emphasis, concentration, or track

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

Techniques in Neuroscience is an intensive “hands on” laboratory course that exposes students to a variety of
neuroscience techniques, including electrophysiology (the recording of electrical signals generated during neural
communication), neuroanatomical (using dyes to visualize neurons, neuronal tracts and brain structures) and histological
techniques (the preparation of neural tissue for neuroanatomical analysis), stereotaxic surgery (used to access specific
regions of the brain for investigating brain function through pharmacological and/or electrophysiological methodology),
microsurgery (surgical procedures performed under a microscope to access the nervous system for neurobiological
investigations), and behavioral analysis. Students will employ these techniques to investigate various concepts in
neuroscience including, but not limited to, sensory processing, sensorimotor integration, neuromodulation, and the activity
of individual neurons.

The other neuroscience-related lab course currently offered at the College of Charleston focuses primarily on
neuroanatomy and behavioral laboratory experiments. The Techniques in Neuroscience course includes a number of
electrophysiological techniques (whole nerve recordings, brain recordings, and intracellular recordings) that are not available
in courses currently offered by the College of Charleston. The electrophysiology techniques allow students to investigate
basic principles of neural and nervous system function as well as relate activity at the neuronal level to behavior. A substantial portion of neuroscience research involves electrophysiological techniques to understand nervous system structure and function, a fundamental area of biology.

Techniques in Neuroscience is designed for junior and senior level students minoring in neuroscience but is also available to Biology students with the required pre-requisites.

**D. CURRICULUM.** For revised programs, please attach the complete curriculum. 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.

New course in bold.

**Biology Major Teaching Option Requirements**

Degree: Bachelor of Science

Credit Hours: 61+ (does not include Secondary Education Cognate Major Requirements)

Students interested in teacher certification in biology must complete the following courses and the secondary education cognate major requirements. See the School of Education, Health and Human Performance section of this catalog for a listing of the required secondary education cognate major courses. Students should apply for acceptance to this program no later than the second semester of their sophomore year. Requirements for this include admission to and successful completion of the approved teacher education program. Students must successfully complete all requirements for certification in secondary education.

Notes: When declaring teacher certification in biology through the Program of Study Management System (POSM), students must first select "Declare or Add a Major" and then "Secondary Education Cognate" from the major list. Once this selection is made, a second menu box will appear with a list of the associated majors. Select the biology major and follow the on-screen instructions.

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

Courses within this major may also satisfy general education requirements. Please consult [http://advising.cofc.edu/general-edu](http://advising.cofc.edu/general-edu) for more information.

**Required Courses:**

**BIOL 111**  Introduction to Cell and Molecular Biology (3) PR: None; CO: BIOL 111L

**BIOL 111L**  Introduction to Cell and Molecular Biology Lab (1) CO: BIOL 111

OR

**HONS 151**  Honors Biology I (3) PR: None; CO: HONS 151L

**HONS 151L**  Honors Biology I Lab (1) CO: HONS 151

**BIOL 112**  Evolution, Form, and Function of Organisms (3) PR: BIOL 111 and 111L; CO: BIOL 112L
BIOL 112L  Evolution, Form, and Function of Organisms Lab (1) CO: BIOL 112L
OR
HONS 152  Honors Biology II (3) PR: HONS 151 and 151L; CO: HONS 152L
HONS 152L  Honors Biology II Lab (1) CO: HONS 152

BIOL 211  Biodiversity, Ecology, and Conservation Biology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; CO: BIOL 211D
BIOL 211D  Biodiversity, Ecology, and Conservation Biology Discussion (0) CO: BIOL 211
BIOL 305  Genetics (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D and MATH 250 or instructor permission

Complete one of the following courses:

BIOL 312  Molecular Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250

BIOL 313  Cell Biology (3) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; and BIOL 211 and 211D or CHEM 232 and 232L; PR or CO: MATH 250; BIOL 305 or CHEM 232 and 232L

Complete one of the following laboratories:

BIOL 312L  Molecular Biology Laboratory (1) PR or CO: BIOL 312 and MATH 250. Students cannot use both BIOL 412 and BIOL 312L towards their major requirements.

BIOL 313L  Cell Biology Laboratory (1) PR or CO: BIOL 313 and MATH 250

BIOL 305L  Genetics Lab (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; PR or CO: BIOL 211 and 211D, BIOL 305 and MATH 250

Complete one of the following courses:

BIOL 304  Plant Physiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and one year of chemistry; PR or CO: BIOL 305 and MATH 250

BIOL 321  General and Comparative Physiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; PR or CO: MATH 250 or equivalent course in statistics or instructor permission

Complete at least one course from the following:

BIOL 300  Botany (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250
Complete at least one course from the following:

**BIOL 310** General Microbiology (4) PR: One year of Chemistry and BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; and BIOL 211 and 211D; or CHEM 232 and 232L; PR or OR: MATH 250; BIOL 305 or CHEM 232 and 232L

**BIOL 322** Developmental Biology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 323** Comparative Anatomy of Vertebrates (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 332** Vertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 333** Ornithology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 334** Herpetology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 335** Biology of Fishes (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 336** Parasitology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 337** Invertebrate Zoology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 338** Entomology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250

**BIOL 343** Animal Behavior (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or OR: MATH 250
Select 3-7 credit hours of any 300-level course listed above or from the following:

**Biol 314** Immunology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and one year of Chemistry; PR or CO: MATH 250

**Biol 340** Zoogeography (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**Biol 341** General Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250

**Biol 342** Oceanography (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250; one year of college-level Math and one year of college-level Chemistry

**Biol 350** Evolution (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; PR or CO: MATH 250

**Biol 354** Techniques in Neuroscience (4) PR: BIOL 351 or PSYC351 and MATH250 or PSYC211 and PSYC220 or PSYC250 and instructor permission

**Biol 406** Conservation Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305 and BIOL 341 or permission of instructor; PR or CO: MATH 250

**Biol 410** Applied and Environmental Microbiology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; BIOL 310 and one year of Chemistry; PR or CO: BIOL 305 and MATH 250

**Biol 420** General and Comparative Endocrinology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; PR or CO: BIOL 305 and MATH 250 and a course in physiology or instructor permission

**Biol 421** Topics in Physiology, Cell, and Molecular Biology of Marine Organisms (3) PR: BIOL 312 or 313; BIOL 321 and instructor permission; PR or CO: MATH 250

**Biol 444** Plant Ecology (4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 341 or instructor permission; PR or CO: BIOL 305 and MATH 250

**Biol 445** Systematic Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; junior standing and at least one upper division course in organismal Biology; PR or CO: MATH 250

**Biol 450** Problems in Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305; 3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

**Biol 451** Problems in Marine Biology (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and BIOL 305;
3.00 GPA or higher in science courses; junior standing and instructor and department chair permission; PR or CO: MATH 250

BIOL 452 Seminar (1) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D; 2.50 GPA or higher in BIOL; junior standing and 15 credit hours of BIOL completed; PR or CO: BIOL 305 and MATH 250

BIOL 453 Special Topics (1-4) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L and BIOL 211 and 211D and instructor permission; PR or CO: BIOL 305 and MATH 250

Mathematics Requirement

MATH 120 Introductory Calculus (4) PR: MATH 111 or placement
MATH 250 Statistical Methods I (3) PR: Either MATH 111, 120 or instructor permission

Physics Requirement

PHYS 101 Introductory Physics (3) PR: None; CO: PHYS 101L
PHYS 101L Introductory Physics Lab (1) CO: PHYS 101
AND
PHYS 102 Introductory Physics (3) PR: PHYS 101 and 101L; CO: PHYS 102L
PHYS 102L Introductory Physics Lab (1) CO: PHYS 102

OR

PHYS 111 General Physics I (3) PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L
PHYS 111L General Physics I Lab (1) CO: PHYS 111L
AND
PHYS 112 General Physics II (3) PR: PHYS 111 and 111L or HONS 157 and 157L; PR or CO: MATH 220 or equivalent or instructor permission; CO: PHYS 112L
PHYS 112L General Physics II Lab (1) CO: PHYS 112

Chemistry Requirement

CHEM 111 Principles of Chemistry (3) PR or CO: unless students exempt MATH 111 (via diagnostic testing) or have completed this course as a pre-requisite, they are required to take MATH 111 as a co-requisite; CO: CHEM 111L
CHEM 111L Principles of Chemistry Lab (1) CO: CHEM 111
AND
CHEM 112 Principles of Chemistry (3) PR: CHEM 111 and 111L or HONS 153 and 153L; CO: CHEM 112L (MATH 120 strongly recommended)
CHEM 112L Principles of Chemistry Lab (1) CO: CHEM 112
AND

CHEM 102 Organic and Biological Chemistry (3) PR: CHEM 101 and 101L or CHEM 111 and 111L; CO: CHEM 102L.
CHEM 102L Organic and Biological Chemistry Lab (1) CO: CHEM 102

OR

CHEM 231 Organic Chemistry (3) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 231L
CHEM 231L Introduction to Organic Chemistry Laboratory Techniques (1) CO: CHEM 231

Notes:

- MATH 250 is a prerequisite for all 300-level BIOL courses.
- CHEM 221 is a recommended course.
- Honors students can take the alternative sequence of HONS 191/HONS 191L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM 111/111L, CHEM 112/112L, CHEM 231/231L, and CHEM 232/CHEM 232L.
- Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS 112/112L.

E. 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 major or program?</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. Ability to apply quantitative reasoning to biological data</td>
<td>All biology students are required to take Biology 305, Genetics. This subject material provides a good opportunity for students to apply quantitative reasoning to biological datasets. In the case of genetics, such data often are in the form of counts of offspring phenotypes that result from a planned cross. We will use a question on the final exam in Biology 305 that requires students to calculate probabilities of particular outcomes resulting from a cross and, furthermore, use statistical tests to determine if the results of an experiment are consistent with these probabilities.</td>
</tr>
<tr>
<td>2. Ability to apply the process of science</td>
<td>This learning outcome will be assessed with one or more questions on the Biology 211 final exam. These question(s) will propose a scientific question, describe the resources available to the student, and ask the student to develop a manipulative experimental design for problems that allow</td>
</tr>
</tbody>
</table>
experimentation.

3. Ability to communicate scientific results

This learning outcome can also be assessed in Biology 211; in this course all students present results of some type of analysis in the form of posters and talks. Currently, the exact form of the communication (presentations, posters and/or papers) required of students varies by instructor. As a result, we propose to assess this outcome in the second year of our assessment efforts.

4.

Additional Outcomes or Comments:

1) Biology currently conducts senior surveys of all graduates (implemented in Qualtrics)

2) We are currently examining alternative approaches to use direct assessment that include multiple time points in students' careers.

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

The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students). The course is currently being offered for the third time this semester and has not had a significant impact on enrollment in existing courses.

This course serves as a 300+ laboratory elective for Biology majors (B.S., B.A., and B.S. with concentration in Molecular Biology), a 300+ elective for the Marine Biology B.S., a 300+ elective for the Biology minor, and a specialized neuroscience elective for students obtaining a minor in neuroscience.

There is one other laboratory course that includes neuroscience-related material in the Departments of Psychology (PSYC464 Advanced Behavioral Neuroscience with Lab). However, the Techniques in Neuroscience course does not overlap with this course. PSYC464 lab focuses on neuroanatomy (i.e. sheep brain dissection) and behavioral experiments and analysis involving rats. Techniques in Neuroscience involves labs that do not duplicate or overlap with those in PSYC464 and PSYC464 does not offer the exposure to neuroscience techniques (electrophysiology in particular) offered by the Techniques in Neuroscience course. The “hands on” high impact nature of the Techniques course requires the number of students in a lab section to be kept small (8-10 students) and should not have a significant impact on enrollment in existing courses.
G. 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.

Dr. Jeffrey D. Tricklehorn (course instructor) was hired in 2009, in part, to develop and teach this course. A grant from the Howard Hughes Medical Institute (HHMI) Undergraduate Science Education Program provided the funds for the initial lab set up (i.e., equipment, supplies), which was supplemented by the Dean of the SSM (Dr. Mike Auerbach and previous Interim Dean Dr. Jim Deavor). The investment in this course from these two sources is $250,000. The renewed HHMI grant will provide an additional $5000 in funds over the next four years (from academic year 2012/2013 until 2015/2016) to cover recurring costs associated with laboratory disposables.

Funds will be needed each semester from the Biology Department for some research animals (frogs and crayfish) and restocking of disposable supplies after the HHMI funding ends. Other research animals for the course can be obtained without cost, including rats from the College of Charleston IACUP rat breeding program (typically from rats used in other courses and/or faculty research once experiments are finished) and cockroaches from Dr. Tricklehorn’s laboratory colony.

Funds will be requested from the Biology department for an undergraduate student worker that has taken the course previously (when available) for lab preparation and to facilitate running the lab.

Relevant journals can be accessed at Addlestone library, the MUSC library, or online. No additional costs for journals is being requested.

H. CHECKLIST

X I have completed all relevant parts of the form.

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

X 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.

X 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. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: 2/18/13

2. Signature of Academic Dean:

   [Signature]

   Date: 2/21/13
3. Signature of Provost: [Signature] Date: 3/7/13

4. Signature of Curriculum Committee Chair: ________________________________ Date: __________________

5. Signature of Budget Committee Chair: ________________________________ Date: __________________

6. Signature of Academic Planning Committee Chair: ________________________________ Date: __________________

7. Signature of Faculty Senate Secretary: ________________________________ Date: __________________

Date Approved by Faculty Senate: __________________
February 22, 2013

Dear College of Charleston Curriculum Committee

I am submitting a new course proposal, BIOL354 Techniques in Neuroscience, to be included in the College of Charleston Undergraduate Course Catalog beginning in academic year 2013-2014. I have taught this class three times under BIOL/PSYC446 Special Topics in Neuroscience in Spring 2011, 2012, and 2013 and am now requesting that this be made a permanent course offered by the College of Charleston through the Biology Department. I am also requesting that this course be added as a 300 level or above laboratory elective for the Biology B.S., Biology B.S. with a Concentration in Molecular Biology, Biology B.A. degrees as well as the Biology minor. I am also requesting that this course be added as a 300 level or above elective for the Marine Biology B.S. degree as well as an additional option for the Specialized Neuroscience Elective requirement for the Interdisciplinary Minor in Neuroscience.

I have included this Cover Letter, the BIOL354 Techniques in Neuroscience New Course Proposal, the BIOL354 Techniques in Neuroscience Course Syllabus, the Change in Minor Form (Neuroscience), the Change in Minor form (Biology), the Change in Major Form (Biology B.S.), the Change in Major Form (Biology B.S. with a Concentration in Molecular Biology), the Change in Major Form (Biology B.A.), the Change in Major Form (Marine Biology B.S.), and a letter of acknowledgement and support from the Department of Biology for this course to be added as an option for the Specialized Neuroscience Elective requirement for the Interdisciplinary Minor in Neuroscience.

Please contact me with any questions or concerns that you may have at any point.

Thank you for considering my new course proposal and requests.

Sincerely,

[Signature]

Dr. Jeffrey D. Triblehorn
Assistant Professor
Department of Biology
Program in Neuroscience
College of Charleston
triblehornj@cofc.edu
(843) 953-5848
February 15, 2013

Dear College of Charleston Curriculum Committee

This letter is to acknowledge that the Department of Biology supports the new course proposal BIOL354 Techniques in Neuroscience and its inclusion in the Neuroscience interdisciplinary minor as a Specialized Neuroscience Elective option.

Best Regards

[Signature]

Dr. Willem J. Hillenius
Professor and Chair
Department of Biology
College of Charleston
66 George Street
Charleston, SC 29424

T: 843.953.5504
F: 843.953.5453
E: hilleniusw@cofc.edu
Subject: RE: Techniques in Neuroscience as a new course: BIOL354 Techniques in Neuroscience
Date: Monday, February 18, 2013 10:53:34 AM ET
From: Ross, Thomas P
To: Triblehorn, Jeffrey D
CC: Hillenius, Willem Jacob, Greenberg, Dan

Jeff,
Thanks for sending this proposal notice to me and for inviting questions or comments.

First of all, I think you have a great course that offers opportunities for students to develop and/or be exposed to some impressive techniques! Also, thank you for providing alternative prerequisites that would allow any interested PSYC majors (who would most likely be Neuroscience Minors) to enroll in the course.

Regarding my comments/suggestions, please keep the following caveat in mind. I am aware that you have proposed this as a BIOL course rather than a PSYC (i.e., cross-listed) course. Accordingly, if the BIOL Department and Neuroscience Steering Committee have reviewed this course and approve of it, I do not believe our department’s endorsement is required. However, given this course involves PSYC prerequisites and Psychology subject matter - I really appreciate being notified.

In no particular order, here are my thoughts...

I will like to suggest that you consider cross-listing this course (e.g., BIOL/PSYC) in the future. This course, like 351, 352, and 353 represent interesting intersections of PSYC and BIOL, having material and techniques relevant to both majors (especially PSYC majors with the aim of going on to neuroscience graduate programs). As you know, PSYC faculty sometimes teach this course at other institutions and programs, and we have faculty who could/would teach techniques in the future if we only had the resources. I am also aware that staffing limitations can be a problem for the neuroscience program, so it may be advantageous to create courses that can be taught by more than one faculty member if/when needed. Cross-listing this course (i.e., PSYC 354) would allow PSYC faculty the opportunity to teach a “techniques” course in the future (albeit different techniques). For example, Mike Ruscio or Jenn Wilhelm would likely emphasize techniques relevant to fluorescent microscopy and histology.

Thank you for addressing the issue of potential overlap with PSYC 464 in your proposal. I have consulted neuroscience faculty in the Psychology Department and they have assured me that your course (as proposed) is significantly different from PSYC 464. This was my view all along, but it was nice to receive the unanimous support of faculty who routinely teach PSYC 464. In summary, I agree with your current assessment that there is not a significant (or otherwise problematic) degree of overlap at present.

One last comment/suggestion... if you don’t ever foresee this course as a cross-listed course or a course that others will teach, perhaps you could consider a different course number so that 354 remains an option available for a new cross-listed BIOL/PSYC courses as the neuroscience minor and planned major develops. Although course numbers can sometimes be arbitrary, it may be advantageous to have the 35X numbers available for future cross-listings as these courses will be listed conveniently and sequentially in the course catalog, providing for ease of recognition for
academic planning and advising.

Again, thank you for extending this professional courtesy. Please accept this email as my acknowledgment of notification. Please feel free to forward this message to the College’s FCC or other parties if needed. I have already Cc’d Dan Greenberg (FCC Chair) on this message for your convenience.

Tom

P.S. Thanks again for developing such interesting and valuable coursework opportunities for our students!

Thomas P. Ross, Ph.D.
Professor and Chair,
Department of Psychology
57 Coming Street, Room 104
Charleston, SC 29401
Voice Mail: (843) 953-3339
Fax: (843) 953-7151
Email: rosspt@cofc.edu

From: Triblehorn, Jeffrey D
Sent: Wednesday, February 13, 2013 10:48 PM
To: Ross, Thomas P; Kuthirummal, Narayanan
Subject: Techniques in Neuroscience as a new course: BIOL354 Techniques in Neuroscience

Hello Drs. Ross and Kuthirummal

As you may know, I began teaching a new laboratory course entitled Techniques in Neuroscience as a Special Topics in Neuroscience course. I am currently teaching the course as a Special Topics course for the third time, which is the last time that I am able to teach it in this form. I have put together a new course proposal to be submitted to the College of Charleston Curriculum Committee by the February 22, 2013 deadline. The official course proposed is BIOL354 Techniques in Neuroscience.

I am informing you about this new course since I am also submitting the paperwork to include this as an additional option for the Specialized Neuroscience Elective requirement for the Neuroscience minor, in which both the Department of Psychology and Department of Physics and Astronomy participate. I have attached a copy of the new course proposal, syllabus, and Change in Minor form if you wish to look at them.

Dr. Kuthirummal: Jaap told me to let you know that this will be discussed in next week’s SSM Chairs meeting. Please feel free to contact me either before or after that if you have any questions as well.

Dr. Ross: Please also feel free to contact me if you have any questions or concerns.

Please note that the Learning Outcomes and Assessment section of the New Course Proposal is still in revision. I was informed that my original ones were too specific and I am working on more appropriate phrasing (the first attempt at a revision is included in the proposal I sent you, but have not had feedback on the changes yet).

Thank you
Whoops—forgot the NSCI prefix doesn’t exist yet (it does in my head, I suppose). You do need a separate acknowledgement from Biology. The forms you describe involve adding the course to different majors, but that doesn’t cover the fact that the Neuroscience program is drawing on it too. It’s pretty simple—Biology can just send you an email acknowledging the change. You don’t need PSYC or Physics.

DG

--
Daniel Greenberg, PhD
Assistant Professor, Department of Psychology
College of Charleston
Office location: 57 Coming St., Rm. 203
Mailing address: 66 George St., Charleston, SC 29424
Email: greenbergdl@cofc.edu
Phone: (843) 953-5825
Fax: (843) 953-7151

From: Triblehorn, Jeffrey D
Sent: Thursday, February 07, 2013 12:05 PM
To: Greenberg, Dan
Subject: RE: College Wide Curriculum Committee question regarding adding a new course to an existing minor

Hi Dr. Greenberg

Thank you for your answers. Regarding the NSCI prefix, the course is scheduled to have that prefix, but since it is not in existence yet, I have to submit it as BIOL354 and switch it when the NSCI prefix exists. To clarify the acknowledgements then regarding adding the course to the minor, do I only need to obtain an acknowledgement from Biology (since it is only listed in BIOL) or do I need to get acknowledgements from Psychology and Physics as well.

I am also submitting change of major forms to include the course in the various Biology majors/degrees (BA, BS, BS with concentration in Molecular Biology, and Marine Biology B.S.). These are all being submitted with the new course proposal and change in minor form. Does the Biology Chair’s signature on the Change in Major forms for the different Biology majors/degree at all suffice as Biology’s acknowledgement of the new course in the interdisciplinary minor in neuroscience or should a separate letter also be attached to the Neuroscience minor?

Thank you again.

Jeff

Jeffrey D. Triblehorn
Assistant Professor
Department of Biology
Program in Neuroscience
From: Greenberg, Dan  
Sent: Thursday, February 07, 2013 11:52 AM  
To: Triblehorn, Jeffrey D  
Subject: RE: College Wide Curriculum Committee question regarding adding a new course to an existing minor

Hi Jeff,

Here are the answers to your questions:

You should check “interdisciplinary,” since it is—we use different criteria to evaluate interdisciplinary programs. Since you’re simply adding a course, it isn’t a big deal, but we would want an explanation of how this course fits in the minor.

If the course is going to have the NSCI prefix, you don’t need to have acknowledgements from anyone, because it’s the program’s own course. The requirement is there so that other departments know who is using their course, as that allows them to anticipate enrollment demands. If we were to add a new Computer Science course to the minor, for instance, CSCI would have to acknowledge it.

You can check “no” for the major/minor box. It’s not really a big deal; in this case, it’s just there to remind people of the policy (it recently changed and people tend to forget).

Hope that helps—let me know if you have more questions.

DG

Daniel Greenberg, PhD  
Assistant Professor, Department of Psychology  
College of Charleston  
Office location: 57 Coming St., Rm. 203  
Mailing address: 66 George St., Charleston, SC 29424  
Email: greenbergdl@cofc.edu  
Phone: (843) 953-5825  
Fax: (843) 953-7151

From: Triblehorn, Jeffrey D  
Sent: Wednesday, February 06, 2013 10:31 PM  
To: Greenberg, Dan  
Subject: RE: College Wide Curriculum Committee question regarding adding a new course to an existing minor

Dr. Greenberg

I have another question regarding adding a course to the Neuroscience minor. Under Section C, General Information, there is a check box for “Interdisciplinary” with a note to see guidelines and include acknowledgements from relevant departments. Below that is the note about not obtaining a major/concentration and minor in same subject.

Both of these seem to refer to the creation of a new minor.

1) Should I still check the box for “Interdisciplinary” for simply adding a course or leave it blank for adding a new course?
2) Should I just check “no” for the note about major and minor in same concentration or leave it blank for adding a new course?

3) Do I need to include acknowledgements from both Biology and Psychology (possibly Physics) with the Change in Minor form (since those are the departments participating in the Neuroscience minor) saying that each department agrees that this course can be added to the minor as well?

Thank you very much again for your help.

Jeff

Jeffrey D. Triblehorn  
Assistant Professor  
Department of Biology  
Program in Neuroscience  
College of Charleston  
RHSC 205  
58 Coming St.  
843-953-5848

From: Greenberg, Dan  
Sent: Monday, February 04, 2013 11:44 AM  
To: Triblehorn, Jeffrey D  
Subject: RE: College Wide Curriculum Committee question regarding adding a new course to an existing minor

Hi Jeff,

Thanks for asking. Here are the answers to your questions:

1) Please provide the WHOLE curriculum as it appears in the catalog, but make sure it includes the new course. This helps us see where in the minor the new course fits. Basically, take this:

   [link]

   and put your course in the appropriate place.

2) Don’t worry about the prereqs—this will be taken care of with the Course Form in this specific case.

3) The description for your specific course should be on the Course Form. Part E of the Change of Minor Form is asking for the description of the whole minor, as in the link above. You don’t need to stuff this all in Part E; you can attach a printout to the form.

   This is really a lot easier than it sounds—you can more or less just copy/paste what’s in the catalog, add in your course, and you should be good to go. We ask for all of this because otherwise it’s very difficult to get a full picture of what the desired change actually is. Also, if departments/programs keep asking the Registrar’s Office to add a sentence here or there, eventually the whole thing is a cut-and-paste job and is incomprehensible.

   Hope that helps—let me know if you have more questions.

DG

Daniel Greenberg, PhD  
Assistant Professor, Department of Psychology
Hello Dr. Greenberg,

My name is Jeff Triblehorn. I am an assistant professor in the Biology Department and participate in the Program in Neuroscience here at the College of Charleston. I am planning to submit a new course proposal by the 2/22 deadline for a neuroscience lab course that I have been teaching as a special topics in neuroscience course the last three years. I would like to add it to our Neuroscience minor as an option for satisfying the Specialized Neuroscience Elective requirement.

I talked with Dr. Meyer-Bernstein (the director of the neuroscience program) about the change in minor form first and we realized that the form has changed (requiring more information) since she last submitted a change to the minor. Most of the information requested is straightforward and can be taken directly from the new course form. However, I am not sure exactly what is needed for Part E Curriculum since the form applies to either proposing a whole new minor or just adding a new course to the existing minor. I hope you can answer my questions:

1) For providing the complete curriculum, can I just provide how the minor is listed in the course catalog?
2) Do I have to include/provide every prerequisite, co-requisite, or other restriction for every course included in the minor or just the new course I am proposing? I understand the need to lay out the entire curriculum when proposing a new minor, but does the same thoroughness for the entire minor apply for simply adding a new course to the minor?
3) Similar to question #2, phrasing of the catalog description request seems to apply to how the minor should appear in the catalog. Do I include this or should I only include the course description for the new course I am proposing? And do I still provide a complete course list as it appears in the catalog for the minor when I am just adding a new course to an existing minor?

I am sorry for the questions, but it seems to me that the phrasing of the sections is geared towards adding a completely new minor and I want to make sure I include the information actually wants on the form for adding a new course to the minor.

Thank you for your help.

Jeff

Jeffrey D. Triblehorn
Assistant Professor
Department of Biology
Program in Neuroscience
College of Charleston
RHSC 205
58 Coming St.
843-953-5848