

Library Resource Form Required for New Courses

Submission Deadlines: Fall - October 11, 2005 Spring - February 14, 2006

TITLE Biology 1: Diversity, Evolution, and Adaptation

Sponsor(s)
Luke Holbrook e-mail: holbrook@rowan.edu
Maria Tahamont e-mail: tahamont@rowan.edu

DEPARTMENT Biological Sciences
College LAS

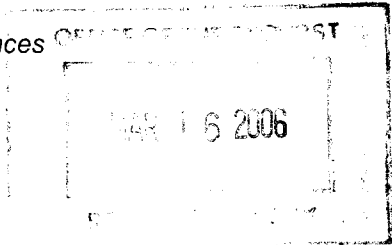
If LAS-check: History/Humanities Social/Behavioral Sciences

Math/Science

UNDERGRADUATE **GRADUATE**

- Minor changes to existing C
- Request new or existing col
- Writing Intensive
- Multicultural-Global
- Changes to General Educat
- New or Existing course to be
- Fine/Performing Arts
- LAS: Social Behavior
- Communication Studies

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Signatures Required: representing approval before submission to Office of the Senate

Department Chair: _____ Date: 10/7/05
 Department CURRICULUM Chair: Gentry _____ Date: 10/7/05
 Academic DEAN: Aug _____ Date: 10-11-05

COLLEGE CURRICULUM COMMITTEE: Open Hearing Date: 18 Nov 2005
Approved: _____
Not Approved: _____

Signature: College Curriculum Chair [Signature]

Signature: SENATE CURRICULUM CHAIR _____
Date: _____

Comments: _____

Signature: Executive Vice President/Provost: _____
Date: _____

Signature: REGISTRAR [Signature]
Date: 3/31/06
Approved: _____
Not Approved: _____

Course Description Received & Approved
Hegis Taxonomy & Course # BIOL 01.104

- Notification Forward:
- SCC CHAIR
 - IR
 - CAP
 - Registrar
 - Academic Dean
 - Department Chair
 - VP/Student Affairs
 - Other-

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This form **MUST BE COMPLETED FOR NEW COURSE or PROGRAM PROPOSALS, and EXTENSIVE CHANGES TO A COURSE or PROGRAM.**

The purpose of this form is to provide a channel of communication between the Campbell Librarians and faculty when submitting new course or program proposals, or making extensive changes to existing courses or programs. The information will be used to assess the resources available in the library, and to identify resources the library should acquire to support the new courses/programs, or extensive changes to same. The information will also provide the rationale for institutional support for library acquisitions. This form should be completed in a coordinated effort between the course sponsor(s) and the academic department liaison librarian.

Note: Sponsor(s) complete parts A & B
If assistance is required to complete, please notify the librarian liaison.
Forward this form to the librarian who will complete parts C, D & E

When form is completed, attach to the original curriculum proposal before submitting to the Senate office.

A. **College:** LAS

Department: Biological Sciences

Proposed by: Luke Holbrook

Date: 10/7/2005

COURSE TITLE: Biology 1: Diversity, Evolution, and Adaptation

Anticipated Date for Course/Program Offering: Fall 2006

B. List specific resources that should be acquired to support this course.

We anticipate that current library resources are sufficient for this course.

C. Describe the resources available in the library to support this course/program, including reference, monographic, electronic databases, audio-visual materials, etc. A summary statement is sufficient.

We have 88 books under the subject heading Evolution (Biology), 27 books under the heading Biological Diversity, and 22 books under the heading Adaptation (Biology) in the library. Databases supporting this area include Science Direct, Medline, Nature, Annual Reviews, and Biological and Agricultural Index.

D. List key periodicals available in the library to support this course/program.

We have print and online subscriptions to the journals *Evolution* and *Natural History* available to support this course.

E. Librarian comments & recommendations:

The library can support the new course with our current resources.

LIBRARIAN LIAISON: Denise Brush

Signature: Denise A. Brush

New Course Proposal

Biology 1: Diversity, Evolution, and Adaptation

Details

- a. Course Title:** Biology 1: Diversity, Evolution, and Adaptation
- b. Sponsor:** Luke Holbrook, Associate Professor, and Maria Tahamont, Professor Department of Biological Sciences
- c. Credit Hours:** 4 s.h.
- d. Course Level:** Undergraduate (100-level). This course will be offered as a General Education elective in the Science and Mathematics bank
- e. Prerequisites:** None
- f. Implementation:** The proposed course would be offered for the first time fall semester 2006 and will be offered every fall semester thereafter. This course is intended for students majoring in Biology.

Curricular Effects

This course will be the first course in the new core sequence for Biology majors. The new Biology core for majors consists of four courses which will provide sufficient depth in content and develop the appropriate skills necessary for success in upper-level Biology courses, as well as providing a strong foundation for biology-related careers.

This course will also fulfill in part (for non-Biology majors) the Science and Mathematics bank of the University's General Education requirements. We expect that it will be utilized particularly by students in the Department of Computer Science for whom a two-semester laboratory science sequence is required. The course will also fulfill the requirement for one semester of Biology which is part of the Physical Sciences major.

The personnel and facilities of the Biological Sciences department are adequate for the proposed course. Other resources anticipated for implementation, such as materials for laboratory exercises, should be covered by current departmental funding and no cost of implementation is expected. Library resources are also adequate to meet the present needs of this course.

Rationale

This course is designed to introduce new Biology majors to our new core curriculum. It lays the foundation for the new curriculum and introduces students

to the evolution of and diversity of adaptations among organisms. The course will also introduce students to the scientific method and develop the basic skills for collecting, analyzing, and presenting data.

Essence of the Course

a. Objectives of the Course: Throughout this course, we will focus on fundamental biological concepts, specifically those relating to organismal diversity, evolution, and adaptation, as well as the development of basic skills for biological inquiry.

Student Outcome Objectives:

- Basic understanding of the pattern of organismal diversity.
- Comprehension of evolutionary concepts and an appreciation of their relevance to biological phenomena.
- Appreciation of the role of adaptation in explaining the relationship between structure and function.
- Familiarity with experimental design, data collection, and basic data analyses
- Familiarity with both the creation and interpretation of graphs and data tables
- Increased critical thinking skills

b. Topical Outline/Content

Outline of Course Content:

Scientific method
Biodiversity
Evolution
Natural selection
Speciation
Homology
Convergence
Niches
Phylogeny and classification
Structure and function of plants and animals

Laboratory Content:

The laboratory portion of the course will be used to reinforce topical concepts covered in class and to expose students to experimental approaches to various fields in science. Various methods can be used to achieve these goals. In the laboratory a combination of the following techniques will be used at the discretion of the course instructor:

1. Investigative laboratory exercises: Students will be guided through a series of laboratories designed by the course instructor to expose students to a particular experimental approach and/or laboratory skills.

2. After an initial exposure to a particular technique or experimental approach, students will design and execute their own experiments using the newly learned approach/technique.
3. Literature research: Students will explore experimental approaches through analysis of the primary and secondary literature and may use this literature to design and execute experiments.

c. Evaluation of Students and Grading

Students will be evaluated using various tools which may include written exams, written and oral analysis of scientific literature, oral presentations, and class discussion. In addition, assessment of laboratory work may include evaluation of the following: laboratory notebooks, experimental designs, laboratory reports, and oral presentations.

d. Course Evaluation

The Biological Sciences Department evaluates all courses to ensure that they meet the requirements of the Department, the College of Liberal Arts and Sciences, and the University. The assessment of these new core courses will be particularly rigorous and will follow procedures outlined in the proposal detailing the overall changes to the Biology major.

Results of Consultations

a. Letters of consultation:

The members of the Biological Sciences Department have been solicited for comments on the course proposal, and they have confirmed that this course would meet the standards of their department. A letter of consultation from the department chair is attached.

Consultation letters indicating support for this course are also attached from the Departments of:

- Chemistry and Biochemistry
- Physics and Astronomy
- Computer Science
- Psychology
- Chemical Engineering
- Mechanical Engineering
- Secondary Education

Catalog Description

Biology 1: Diversity, Evolution, and Adaptation

~~0401-103~~

Prerequisites: none

This laboratory course is designed for freshman Biology majors and is the first of a four-course introductory sequence. This course introduces students to organismal diversity and its evolutionary origins, covers the fundamental concepts of evolutionary theory, and surveys many of the ways that organisms have become adapted to their environments. In addition, students in this course will learn some of the basic skills necessary for scientific inquiry, including the scientific method, critical thinking, experimental design, and the gathering, analysis, and presentation of quantitative data.

To Whom It May Concern:

This email is intended to confirm not just my endorsement of the five new Biology Core courses and additional changes to the major, but also an endorsement from the Department as a whole. The entire Department has been consulted at every step in the development of these curricular proposals, and it has always met with unanimous support.

These changes will bring our Department to a level similar to comparable institutions. The emphasis in the new Core will be not just on knowledge content, but also on the skill content. We anticipate that the Core revisions will have a profound impact on the sophistication of our upper-level courses and on the marketable skills of our graduates. The commitment of our faculty to these changes is illustrated by their attendance at weekly core curriculum development meetings. The additional changes to our degree requirements directly address Department objectives and will enrich the qualifications and skill sets of our majors.

These new courses and the overall curricular changes have my strong, enthusiastic support, and I am happy to confirm that the Department is eager to implement them.

Sincerely,

Gregory B. Hecht, Ph.D.
Interim Chairperson
Associate Professor of Microbiology
& Molecular Biology
Department of Biological Sciences
Rowan University
201 Mullica Hill Road
Glassboro, NJ 08028
Office: Science Hall 130D
Laboratory: Science Hall 221
(856) 256-4834 (office, phone mail)
(856) 256-4500 x3577 (phone mail only)
x3024 (lab)
Fax: (856) 256-4478
hecht@rowan.edu
<http://users.rowan.edu/~hecht>
<http://www.rowan.edu/biology>



Department of Physics and Astronomy

Date: October 10, 2005
To: Dr. Michael Grove
From: Jeff Hettinger, Chair, Department of Physics
and Astronomy
Re: Curriculum Proposal

This memo provides the support of the Department of Physics and Astronomy for the reconfiguration of the introductory courses in the Biology program. We feel that this is an excellent idea/plan.

Students in our Physical Science program who are currently required to take either Biology I or II can be accommodated by your new Biology I course since it will remain in the Math/Science General Education Bank and the content description seems practical for this group.

These modifications may impact decisions our department makes in the future. Our department has been considering the possibility of enhancing our Physics program to include some Biophysics content in the form of a concentration or minor. Your response to Dr. Newland with regard to his Biochemistry program suggesting that it would be possible to take Biology II and III as well as upper level courses in Biology if the skills developed in Biology I and IV were accounted for in other courses ensures us that we can work out a solution to this issue when it arises.

The Department of Chemistry and Biochemistry fully supports the efforts of your department to reinvent your core courses. It is admirable that you engage in this level of effort to recreate the beginnings of your field and especially to include the broader concepts of science. We are very interested in your inclusion of active teaching methods and will watch this change carefully. We are also intrigued by the lab changes you propose that will result in the adoption of more inquiry based experiences.

We appreciate the many discussions we have had to fine tune the curriculum our biochemistry majors should follow under this new scheme.

Robert Newland, Ph.D.
Chair, Chemistry & Biochemistry
Rowan University
201 Mullica Hill Rd.
Glassboro, NJ 08028
(856) 256-4502
FAX (856) 256-4478
newland@rowan.edu

Michael,

The Computer Science Department supports your proposed changes in the Biology sequence. Since our majors are required to take 3 semesters of lab science, and they often opt for Biology I and II, we are pleased to note the emphasis on Genetics and Evolution. This will help prepare our students for further study in Bio-informatics in graduate school.

Seth D. Bergmann	Interim Department Chair
Computer Science	bergmann@rowan.edu
Rowan University	856-256-4500 ext. 3197
Glassboro, NJ 08028	Fax: 856-256-4741
USA	cs.rowan.edu/~bergmann

To: Mike Grove, Biological Sciences
From: Keiko Stoeckig, chairperson, Psychology Department
Date: October 6, 2005
RE: proposed changes to current Introductory Biology curriculum and Biology major

The Psychology Department has reviewed the proposed revisions to the Biology major and the Introductory Biology courses, and we would like to commend Mike Grove and the Biology Department for crafting such a thoughtful proposal. The overall revision to the Biology major, of course, is best evaluated by the Biology Department, and it will have little immediate effect for the Psychology Department. However, the restructuring of the Introductory Biology courses could have a substantial impact on the General Education courses required for Psychology majors.

Currently, Psychology majors are required to complete one of the following to fulfill the lab science General Education requirement: General Biology: Human Focus, Biology I, Biology II, or Anatomy & Physiology I. The Psychology Department has no objection to the restructuring of content as proposed for the new Biology 1 and Biology 2 courses, so long as these courses will be offered as General Education courses (as has been indicated in the course proposals). In fact, the content described in the proposed Biology 1 course appears to better fit the needs for a Psychology major than the content of the current Biology I course. (However, General Biology: Human Focus remains the course that best meets our needs, and thus will remain the recommended course for Psychology majors.)

There is some concern that the content of the proposed Biology 2 course might be too narrowly focused to satisfy the needs of our majors, so it might be the case that the Psychology Department would not permit Biology 2 to be used to fulfill the Biology lab science requirement. This could become problematic for transfer students, if the General Biology course taken at a community college were to be accepted as equivalent to the proposed Biology 2 course rather than the proposed Biology 1 course. However, in the event that this should happen, the Psychology Department might be willing to allow transfer student to complete another Biology course (such as Human Biology) to fulfill our Biology requirement. Nevertheless, attention to the transfer equivalence of the proposed Biology 1 and Biology 2 courses would be an important consideration for the Psychology Department.

Although, as stated earlier, the revision of the Biology major has little immediate impact on the Psychology Department, this revision might have a longer-term effect on the structure of a future neuroscience major (a joint program, in the early stages of development, to be proposed by the Psychology and Biology Departments). The increased flexibility afforded by the proposed changes to the Biology major would appear to allow for an easier integration of Biology courses into the neuroscience program, so from that standpoint, as well, the Psychology Department is supportive of the proposed revisions.

In summary, the Psychology Department offers its full support for this proposal. Although it is possible that, as a result of this revision, some initial minor difficulties might occur, the Psychology Department is certain that any such issues can be resolved. Thus, we believe that this well-conceived program proposal deserves the University's full support.

Thank you for the opportunity to review your program proposal. If you require additional information, please feel free to contact me at x4821 or stoeckig@rowan.edu.

A handwritten signature in black ink that reads "Keiko Stoeckig". The signature is written in a cursive style with a long, sweeping tail on the letter "g".



Memorandum

Mechanical Engineering

To: Dr. Michael Grove, Department of Biological Sciences

From: John Chen, Associate Professor and Chairperson

Date: 5 October 2005

Re: Letter of consultation for proposed revision of the introductory biology curriculum

This letter is in support of the proposal entitled, "Revision of the Introductory Biology Curriculum and Biology Major," prepared and sponsored by the Department of Biological Sciences. My program supports the proposed revision and the new structure of the introductory biology sequence. These changes will not adversely affect Mechanical Engineering students.

Please contact me if there are further questions or concerns. Thank you.

The Chemical Engineering program has reviewed your curriculum proposal and we are supportive of the proposed changes to the Biological Science Curriculum.

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Robert P. Hesketh
Professor and Chair
Chemical Engineering
Rowan University
201 Mullica Hill Rd.
Glassboro, NJ 08028-1701

Phone: (856) 256-5313
Fax: (856) 256-5242
email: hesketh@rowan.edu
<http://users.rowan.edu/~hesketh>

Mike,

I have been reviewing the proposals for the biology core revision.

I'm impressed with the careful rethinking of your entire program that the department has undertaken. In COE we know a good deal about the work involved in a major restructuring of a curriculum! The active learning assignments and activities, the engagement with the professional literature, the deep holistic understanding of the field that you're striving for—these are elements that will strengthen student engagement with biology.

While our department curriculum committee hasn't had an opportunity to look at all the proposals in the detail they merit, I am venturing to suggest a couple of relatively small changes

1. The Course Evaluation section of the Biology 1 proposal needs more specific methods. Perhaps you should refer to the core curriculum proposal where these methods are described.
2. I note with approval that you're requiring Bio 1 students to use primary literature. However, you say that library resources are adequate. Are you sure about that? Will students have access to the databases and research articles they will need? I know that you're asking for a chunk of money to supply the laboratories needed for the new courses and you probably want to avoid asking for library resources in addition. However, you do need to have Greg Potter complete the library resources form for each of these course proposals and the core curriculum proposal. You're expected to at least list the resources available to you currently.

Initially, it appears that K-12 Subject Matter Teaching students will not be affected negatively by the change as the total number of credit hours will not change. The sequencing of the courses may need to be carefully worked out in future years for those students who are dual majors with K-12 Subject Matter-Biology. The special course to integrate transfer students is an excellent idea, and perhaps a model that other departments should emulate.

The inquiry-based methods you're proposing for your new curriculum might dovetail well with the Inquiry and Discovery course that elementary education majors are required to take in the new program. Just a thought!

After our SE/FE curriculum committee reviews your proposals, I will write a more formal letter. However, I believe that you can use this e-mail as evidence that you have consulted with us.

By the way, was your NSF CCLI proposal funded?

Holly Willett
Chair
SE/FE



November 7, 2005

Dr. Michael Grove
Biology Department
Science Hall
Rowan University
Glassboro, NJ 08028

Dear Mike,

Thank you for the opportunity to review the proposed changes in the biology core curriculum and the five proposed courses required to implement the curriculum. I apologize for this very tardy letter of consultation.

The Secondary Education/Foundations of Education departmental curriculum committee has reviewed the proposals and supports them. We do not believe they will affect adversely our students, though we will need to be careful in scheduling our science methods courses. As we are consulting with the academic content major departments as we start scheduling our new courses, we do not view this as a difficult or onerous task. We are pleased to note the particular care you took to accommodate transfer students.

Personally, I think the proposals are a creative way of meeting changing perspectives in educating the next generation of biologists. My compliments to the committee.

Cordially,

Holly G. Willett
Associate Professor
Chair, SE/FE

Department of Secondary Education/
Foundations of Education

College of Education
201 Mullica Hill Road
Glassboro, NJ 08028-1701

856-256-4755
856-256-4918 fax