

UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: ___ Dan Simmons _____ phone number ___ 8547 _____

Department: ___ Biological Sciences ___ email address ___ dsimmons@udel.edu _____

Action: ___ Revise BS degree program with a concentration in biotechnology _____
(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term _____ **08F** _____
(use format 04F, 05W)

Current degree _____ **BS** _____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: _____ **BS** _____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: _____ **No change** _____
Proposed new name for revised or new major / minor / concentration / academic unit
(if applicable)

Revising or Deleting:

Undergraduate major / Concentration: Biological Sciences-concentration in Biotechnology BSAS
(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor: _____
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change: _____
(**Must attach** your Graduate Program Policy Statement)

Graduate Program of Study: _____
(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration: _____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the

overall program objectives of the major/minor/concentrations)?

(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter “None”)

BISC 484- Computer based genetics lab

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: <http://www.ugs.udel.edu/gened/>

The proposed revisions to this program are consistent with all 10 stated goals.

Identify other units affected by the proposed changes:

(Attach permission from the affected units. If no other unit is affected, enter “None”)

None

Describe the rationale for the proposed program change(s):

(Explain your reasons for creating, revising, or deleting the curriculum or program.)

This is a proposal to modify the existing BS degree program with a concentration in biotechnology in order to make it more appealing to biology students. In response to student complaints that the time in the laboratory is excessive, the major changes in the program are in IV) Laboratory classes. BISC413 has been eliminated from the list of 2 credit laboratories and been replaced with a new 3 credit course (BISC484) tentatively called “Computer Based Genetics Lab”. Another addition to category IV is 4 credits of Independent Research (BISC466 or U401 plus U402 or BISC451 plus BISC452), with some restrictions (see below). It is proposed that students take any three of the five category IV courses to satisfy program requirements. This change should ease the time burden somewhat since many of the students in the program are performing independent research anyway. Some course number changes have also been made to those in category IV) because they are not true graduate level classes. Other changes include math 241 for 221 as well as the list of approved 6xx courses in VI) Upper Division Requirements. With these changes, it is estimated that the Department can accommodate at least 20 biotech students per year.

Program Requirements:

(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

I. Required lower level Biology courses

Course Name and Number	Credit Hours
BISC 207 Introductory Biology I	4
BISC 208 Introductory Biology II	4
BISC 280 Fundamentals of Biotechnology	1
BISC 300 Introduction to Microbiology	4
BISC 305 Cell Physiology	3
BISC 401 Molecular Biology of the Cell	3
BISC 403 Genetic and Evolutionary Biology	3

II. Required lower level Biology Laboratory courses

Note that for all the two credit labs, the lecture is a prerequisite. (THE LECTURE AND THE LAB CANNOT BE TAKEN SIMULTANEOUSLY)

Course Name and Number	Credit Hours
BISC 411 Molecular Biology of the Cell laboratory	2
BISC 315 Experimental Cell Biology	2

III. Biology breadth requirement

Choose at least one from the following courses:

Course Name and Number	Credit Hours
BISC 306 General Physiology	3
BISC 408 Mammalian Histology	4
BISC 471 Immunobiology	3
BISC 492 Human and Mammalian Cytogenetics	3

IV. Laboratory classes

Choose three of the following courses:

Course Name and Number	Credit Hours
BISC 484 Computer Based Genetics Lab	3
BISC 481 Immunochemistry Laboratory	4
BISC 482 Nucleic Acids Laboratory	4
BISC 483 Gene Expression Laboratory	4
BISC 466 Independent Research*	4

*** The four credits of BISC466 must be taken with the same professor and must be over at least 2 semesters. An approved summer experience, such as University sponsored summer research, can substitute for 1 semester. U401 plus U402 or BISC451 plus BISC452 (6 credits total) can also substitute for BISC466.**

V. Required courses from other departments

Chemistry

Course Name and Number	Credit Hours
CHEM 103 and CHEM 104 General Chemistry	8
CHEM 321/325; CHEM 322/326 Organic Chemistry	8
CHEM 527 Introductory Biochemistry, OR	3, OR
CHEM 641 Biochemistry and CHEM 643 Intermediary Metabolism	6

Physics

Course Name and Number	Credit Hours
PHYS 201 Introductory Physics I and PHYS 202 Introductory Physics II	8

Math

Course Name and Number	Credit Hours
MATH 241 Analytic Geometry and Calculus A	3

VI. Upper division requirements

Choose two courses from the following list:
(At least one must be a BISC course)

1. ANSC 670 Principles of Molecular Genetics
 2. BISC 600 Biotechnology and Molecular Medicine
 3. BISC 602 Molecular Biology of Animal Cells
 4. BISC 605 Advanced Mammalian Physiology
 5. BISC 612 Advanced Cell Biology
 6. BISC 615 Vertebrate Developmental Biology
 7. BISC 654 Biochemical Genetics
 8. BISC 656 Evolutionary Genetics
 9. BISC 665 Eukaryotic Molecular Biology and Genetics
 10. BISC 671 Advances in Immunology
 11. BISC 679 Virology
 12. BISC 693 Human Genetics
 13. CHEM 645 Proteins: Structure and Function
 14. CHEM 646 DNA-Protein Interactions
 15. CHEM 648 Membrane Biochemistry
- Any additional BISC481 through 484 laboratory course taken above the minimum of two may also count towards the upper division requirement.
 - Other upper division classes may also be approved at the discretion of the Undergraduate Programs Director.
 - A grade of D (not D-) or better must be obtained in Chemistry, Physics and Mathematics courses required for all Biological Sciences majors and minor.

VII. University and College requirements for all Biological Sciences B.S. concentrations

This is the existing program:

I. Required lower level Biology courses

Course Name and Number	Credit Hours
BISC 207 Introductory Biology I	4
BISC 208 Introductory Biology II	4
BISC 280 Fundamentals of Biotechnology	1
BISC 300 Introduction to Microbiology	4

BISC 305 Cell Physiology	3
BISC 401 Molecular Biology of the Cell (Prerequisites: BISC 207, BISC 208, CHEM 321 Organic Chemistry)	3
BISC 403 Genetic and Evolutionary Biology	3

II. Required lower level Biology Laboratory courses

Note that for all the two credit labs, the lecture is a prerequisite. (THE LECTURE AND THE LAB CANNOT BE TAKEN SIMULTANEOUSLY)

Course Name and Number	Credit Hours
BISC 411 Molecular Biology of the Cell laboratory	2
BISC 315 Experimental Cell Biology, OR	2
BISC 413 Genetic and Evolutionary Biology laboratory	

III. Biology breadth requirement

Choose at least one from the following courses:

Course Name and Number	Credit Hours
BISC 306 General Physiology	3
BISC 408 Mammalian Histology	4
BISC 471 Immunobiology	3
BISC 492 Human and Mammalian Cytogenetics	3

IV. Laboratory classes

Choose three of the following courses:

Course Name and Number	Credit Hours
ANSC 644 Bioinformatics	3
BISC 601 Immunochemistry Laboratory	4
BISC 604 Nucleic Acids Laboratory	4
BISC 619 Gene Expression Laboratory	4

V. Required courses from other departments

Chemistry

Course Name and Number	Credit Hours
CHEM 103 and CHEM 104 General Chemistry	8
CHEM 321/325; CHEM 322/326 Organic Chemistry	8
CHEM 527 Introductory Biochemistry, OR	3, OR
CHEM 641 Biochemistry and CHEM 643 Intermediary Metabolism	6

Physics

Course Name and Number	Credit Hours
PHYS 201 Introductory Physics I and PHYS 202 Introductory Physics II	8

Math

Course Name and Number	Credit Hours
MATH 241 Analytic Geometry and Calculus A	3

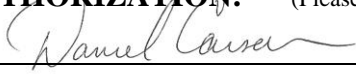
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 13. CHEM 645 Proteins: Structure and Function
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 15. CHEM 648 Membrane Biochemistry
- Any additional 6XX laboratory course taken above the minimum of three may also count towards the upper division requirement.
 - Other upper division classes may also be approved at the discretion of the Undergraduate Programs Director.
 - A grade of D (not D-) or better must be obtained in Chemistry, Physics and Mathematics courses required for all Biological Sciences majors and minor.

VII. University and College requirements for all Biological Sciences B.S. concentrations

ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson  Date 10/29/2008

Dean of College _____ Date _____

Chairperson, College Curriculum Committee _____ Date _____

Chairperson, Senate Com. on UG or GR Studies _____ Date _____

Chairperson, Senate Coordinating Com. _____ Date _____

Secretary, Faculty Senate _____ Date _____

Date of Senate Resolution _____ Date to be Effective _____

Registrar _____ Program Code _____ Date _____

Vice Provost for Academic Affairs & International Programs _____ Date _____

Provost _____ Date _____

Board of Trustee Notification _____ Date _____

Revised 10/23/2007 /khs