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: ___Melinda K. Duncan_____phone number__0533___

Action: ____Request for New Concentration in Cell and Organ Systems for the M.S. Biological Sciences_____

(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___08J_____

(use format 04F, 05W)

Current degree_____MS _____

(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degrees of: __MS _____

(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed names:___MS in Biological Sciences with a concentration in Cell and Organ Systems_____

Proposed new name for revised or new major / minor / concentration / academic unit (if applicable)

Revising or Deleting:

Undergraduate major / Concentration:_____

(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:_____

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

Graduate Program Policy statement change:_____

(Attach your Graduate Program Policy Statement)

Graduate Program of Study:_____

(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration:_____

List program changes for curriculum revisions:

None, this proposal seeks to codify our ongoing departmental policies at the level of the University.

List new courses required for the new or revised curriculum:

(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")

None

Other affected units:
(List other departments affected by this new or revised curriculum. Attach permission from the affected units. If no other unit is affected, enter "None")

None

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

Our department has required all of our graduate students to complete the curricular requirements of a "track" for many years although the track curricular requirements were never approved at the university level. At the request of the Office of Graduate Studies, we submitted our graduate program policy through the appropriate channels for approval. In February of 2008, it was suggested by the University Graduate Studies Committee that we further revise our curriculum to change the term "Track" to "Concentration" so that the student's curriculum is noted on their transcript. This new proposal is in response to this request by the University graduate studies committee.

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 present curriculum.)

See Attached.

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

Department Chairperson _____ Date _____

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 Programs & Planning _____ Date _____

Provost _____ Date _____

Board of Trustee Notification _____ Date _____

Revised 11/03/04 /khs

Concentration in Cell and Organ Systems

Policy and Curriculum

The Cell and Organ Systems Graduate Concentration encompasses a wide diversity of research areas, including cell biology, organ systems physiology, extracellular matrix biology, cell signaling, developmental biology and others. It is anticipated that, given the enormous increase in gene sequence data available, there will be an increasing need for individuals broadly trained in disciplines such as these. The goal of this concentration is to provide students a rigorous environment and careful guidance in their efforts towards earning a graduate degree. The curriculum provides for a breadth of background knowledge, skill development in oral and written communication and in critical thinking and opportunities for learning a variety of research techniques. The M.S. degree program will emphasize the development and critical defense of an independent research project (thesis).

Students wishing to enter this concentration are expected to have some background (at the undergraduate or graduate level) in general physiology, cell biology, biochemistry and genetics/evolutionary biology.

Students in the M.S. Degree program will take a 16 credit hour core curriculum, as well as a minimum of 8 credits of Research (BISC 868)) and 6 credits of BISC 869 - Master's Thesis (total 30 crdits). M.S. students are not required to specifically take Laboratory Tutorials (BISC 864), but may opt to as a way of identifying a primary thesis advisor.

The curriculum outlined below conforms to both Department of Biological Sciences and University of Delaware policy. (see "Departmental Graduate Program Policy").

Graduate Curriculum

Year One: Fall Semester

Course Name(s) and Number(s)	**Credits**
BISC 605 - Advanced Mammalian Physiology (core)	3
BISC 827 - Graduate Seminar[1] (core)	1
Teaching Assistantship[2]	0
BISC 868 - Research	3

7 total credits

Winter Session[3]

Spring Semester

Course Name(s) and Number(s)	**Credits**
BISC 612 - Advanced Cell Biology (core)	3
BISC 827 - Graduate Seminar (core)	1
Teaching Assistantship	0
BISC 868 - Research	3

7 total credits

Summer Session[3]

Course Name(s) and Number(s)	Credits
Graduate Preliminary Exam - BISC 868 - Research	2

Winter Session[3]

Year 2: Fall Semester

Course Name(s) and Number(s)	Credits
BISC 6XX – Elective (core)	3
BISC 827 - Graduate Seminar (core)	1
Teaching Assistantship	0
BISC 869[4] - Master's Thesis	3

7 total credits

Spring Semester

Course Name(s) and Number(s)	Credits
BISC 806 - Current Topics in Cell and Organ Systems, or BISC 833 - Special Topics in Biology (core)	3
BISC 827 - Graduate Seminar (core)	1
Teaching Assistantship	0
BISC 869[4] - Master's Thesis	3

7 total credits

30 Credits total

Notes

1. BISC 827 - Graduate Seminar is required every fall and spring semester. Students will present oral summaries of their laboratory tutorials or ongoing research.

2. MS students are not explicitly required to serve as departmental teaching assistants but will do so in most cases.

3. Students are expected to spend winter and summer sessions in full time research towards the thesis

4. BISC 869 - Master's Thesis, should be taken by M.S. students who have passed the Graduate Preliminary Exam.

Graduate Electives

The following list of graduate courses are those that have been approved as Electives in the Cell and Organ Systems Concentration. However, other courses, including selected courses from other departments may also be included, with approval of the student's thesis/dissertation committee or of the Graduate Programs Committee. If a graduate level course similar in content to any of these has been accepted as graduate level transfer credit by the University, the transferred course may be used to satisfy the Concentration requirements with the approval of the Concentration coordinator.

BISC 602 - Molecular Biology of Animal Cells

BISC 615 - Vertebrate Developmental Biology

BISC 618 - Computer Imaging in Biology

BISC 625 - Cancer Biology

BISC 630 - Ichthyology

BISC 631 - The Practice of Science

BISC 639 - Developmental Neurobiology

BISC 645 - Bacterial Evolution

BISC 646 - Plant Cell Biology

BISC 656 - Evolutionary Genetics

BISC 660 - Environmental Physiology

BISC 665 - Advanced Molecular Biology & Genetics

BISC 667 - Biological Statistics

BISC 671 - Cell and Molecular Immunology

BISC 675 - Cardiovascular Physiology

BISC 679 - Virology

CHEM 641 - Biochemistry

PLSC 635 - Plant Developmental Biology

Thesis Committees

Students should choose a primary research advisor as soon as possible and prior to the end of their first academic year in the program. This advisor must have a primary or secondary appointment in the Department of Biological Sciences. With the help of the advisor, the student should then select a minimum of two additional advisory committee members, one of whom must have a primary appointment outside the Department of Biological Sciences. It is expected that students will meet at least twice-yearly with their committees (see Graduate Program Policy).

Graduate Preliminary Exam in the Cell and Organ Systems Concentration

All graduate students in the Cell and Organ Systems Concentration must take an oral "Graduate Preliminary Exam," the purpose of which is to evaluate both breadth of knowledge (see the core competency list for more details) and the ability to assimilate and critically evaluate published scientific work in the field. In order to be eligible to take the preliminary exam, students must have completed first year core courses (BISC605 and BISC612) with a grade of B or better. In all cases, the student is expected to correct all deficiencies in their performance in the first year curriculum by the end of the semester after the deficiency occurred but no later than the end of their third semester in the program. If the applicable course is not offered, a suitable substitute will be determined by the Concentration coordinator. Failure to obtain a B or better in a required

course in the second attempt will make the student subject to dismissal from the graduate program. Students are expected to take the preliminary exam within six weeks after the first year curriculum has been successfully completed. If the student fails to complete the preliminary exam by this time, the student will be subject to dismissal.

The examining committee (4 faculty members appointed by the Concentration coordinator each year) will assemble a selection of scientific articles and screen these for consistency in terms of depth and breadth of information covered. Each article will have associated with it, 2-3 secondary or "backup" papers that provide additional background on the topic. The committee will eventually select a candidate pool of 3-4 of these collected papers to present to the students taking the exam. Each student will read through the articles and eventually select one (along with its designated backup papers) to be the basis of their prelim exam. This selection must be communicated to the examining committee.

The student will then be responsible for demonstrating a thorough understanding of all aspects of this work, including tangential areas of methodology, interpretation of results, significance in the context of other work in the field, and any related background (ie. physiology, anatomy, biochemistry, cell biology, etc). Some questions may derive from published articles or textbook materials that are not specifically included in the paper set; it is up to the student to determine what areas they may need to further study by, for example, by carefully reviewing the bibliography of the selected article and the core competency list of topics. The student should have prepared a collection of overheads or slides of all figures and tables from the papers, which may be used during the questioning. Students may consult with members of the examining committee prior to the exam to clarify information or breadth of coverage.

An approximate timetable is as follows:

May 1: Examining Committee makes available to students the selected paper sets

June 1: Each student informs the Examining Committee of their selection

June 15-30: Administration of prelim exam (individually)

There are four possible outcomes: unconditional pass, conditional pass, re-examination, or failure. The student will be informed of the outcome after brief deliberations of the committee and this outcome will also be transmitted to the Graduate Program Director. A conditional pass may be appropriate if the committee felt that the student did not have an adequate background or understanding in one or more specific areas. The conditional pass will be communicated to the student along with specific requirements for strengthening these areas and completing the unconditional pass. These requirements may include one or more specific courses, which must be completed with grades of B or better, specific Teaching Assistantship assignments, special problems or others. The student must inform the Graduate Program Director and the Concentration coordinator when these conditions have been completed. In cases where the committee feels there are more significant problems in background or communication skills the committee may decide on a re-examination. This will be done using the same format and prior to the beginning of the next academic semester. If the student still does not perform satisfactorily on this re-examination, he/she will then be terminated from the Concentration and recommended to the Graduate affairs committee for dismissal from the graduate program. Finally, the examining committee may find that a candidate lacks the skills or motivation to successfully complete a graduate program and may then decide on failure without the possibility of re-examination.

M.S. students who successfully complete the Graduate Preliminary Exam are eligible to finish and defend a Master's Thesis.

Thesis Defense

The M.S. Thesis must be defended in a public presentation. The format is a formal seminar summarizing the work done and its significance, followed by general questions from the audience and, finally, a questioning period by the Thesis Committee

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