

MICHIGAN STATE UNIVERSITY

March 21, 2014

MEMORANDUM

TO: Dr. Douglas Estray, Associate Provost for Undergraduate Education
and Dean of Undergraduate Studies

FROM: Dr. John Gaboury, Associate Provost for Academic Services

RE: Request for a New Linked Bachelor of Science Degree in Physiology
and Master of Science Degree in Physiology

For Transmittal to the University Committee on Undergraduate
Education (UCUE)

The request referenced above is being sent to the University Committee on Undergraduate Education (UCUE) in accordance with the *Bylaws for Academic Governance*, 4.4.

UCUE Response Requested:

Please ask the committee to consider the request referenced above and provide consultative commentary. Please mail the related materials referenced under the heading Attachments at the end of this memorandum to the committee members.

After receiving the committee's consultative response, the Provost will make a determination to forward or not to forward the request to the University Committee on Curriculum for its approval of curriculum and degree requirements.

If you have any questions, please call Joy Speas, University Curriculum Administrator, at 5-8420.

Thank you.

Attachments:

1. Request to Establish a New Academic Program form dated February 18, 2014: Linked Bachelor of Science Degree in Physiology and Master of Science Degree in Physiology and attachments.



University Curriculum and Catalog

Hannah Admin. Building
426 Auditorium Road
Room 151
East Lansing, MI 48824

517-355-8420
Fax: 517-353-1935

s:\share\ucuelinkedbsmmspl

COLLEGE OF NATURAL SCIENCE

1. **Request to establish a Linked Bachelor of Science Degree in Physiology and Master of Science Degree in Physiology** in the Department of Physiology in the College of Natural Science, College of Human Medicine, College of Osteopathic Medicine, and the College of Veterinary Medicine. The College of Natural Science is the primary administrative unit. The University Committee on Undergraduate Education (UCUE) will consider this request. The University Committee on Graduate Studies (UCGS) will consider this request.

Per University policy:

A candidate for a Linked Bachelor's-Master's Degree from Michigan State University may request the application of up to 9 credits toward the master's program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's Program are not eligible to be applied to any other graduate degree program.

- a. Add the following statement in the Department of Physiology:

LINKED BACHELOR'S-MASTER'S DEGREE IN PHYSIOLOGY
Bachelor of Science Degree in Physiology
Master of Science Degree in Physiology

The department welcomes applications from Michigan State University Physiology undergraduate students in their junior and senior year. Admission applications must be made during the prior spring semester for an anticipated spring graduation or the prior fall semester for an anticipated fall graduation to allow admission before the final semester as a Physiology undergraduate. Admission to the program requires a minimum undergraduate grade-point average of 3.5 and an approved program of study for the Master of Science degree in Physiology at the time of admission. Admission to the Linked Bachelor's-Master's program allows the application of up to 9 credits toward the master's program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's program are not eligible to be applied to any other graduate degree program.

Effective Spring 2015.

View a Program		Main Menu
Joy Speas, RO	Tuesday, 2/25/2014	
Program Name: Linked Bachelor's - Master's Degree in Physiology Degree: LINK Sequence Number: 1	Program Request ID: 2567	
Effective Dates: Summer 2014 - Open Status: Interim Initial Action: New		
Requested Date: 11/6/2013 9:50:32 PM		
1. Department/School/College:		
32668 Department of Physiology		
2. Name of Program:		
Linked Bachelor's - Master's Degree in Physiology		
3. Name of Degree:		
LINK		
4. Type of Program:		
Major		
5. Effective Start Semester:		
Summer 2014 <i>Spring 2015</i>		
6. Target student audience for the program:		
Juniors and Seniors within the Physiology Major (CNS and Lyman Briggs College)		
7. Enrollment:		
What is the expected enrollment per year: 5		
What is the minimum enrollment acceptable: 1		
8. Source of budget for the program:		
To align academic planning and curricular change, ALL requests for NEW funds must be included in the College's annual planning letter. Provost approval of new funds and the effective date for the new program must align. If funding is not approved, then the program request will not be forwarded to Faculty Senate.		
Internal reallocation		
If new funds, was this request included in the College's annual planning letter? Indicate yes or no. If no, then this is a department or college fund reallocation (If the program is implemented, no additional resources are required.).		
9. Projected Costs as compared to other programs in unit:		
Same		
10. Staff requirement:		
How many additional staff will be required: 0		
Who will provide the primary instruction. Describe any external linkages(industry,		

government, etc.):

N/A

11. Will additional equipment be required:

Approximate cost: 0

Source of funding:

12. Will additional library materials be required:

Approximate cost: 0

Source of funding: N/A

13. Will additional space be required:

Type:

Approximate amount: N/A

14. If the program requirements contain a named concentration, do you wish for the concentration to be noted on the student's transcript?:

No

15. Detailed Description:

The department welcomes applications from Michigan State University Physiology undergraduate students in their junior and senior year who are completing their degree within the College of Natural Science or within Lyman Briggs College. Admission applications must be made during the prior spring semester for an anticipated spring graduation or the prior fall semester for an anticipated fall graduation to allow admission before the final semester as a Physiology undergraduate. Admission to the program requires a minimum undergraduate grade-point average of 3.5 and an approved program of study for the Master of Science degree in Physiology at the time of admission. Admission to the Linked Bachelor's-Master's program allows the application of up to 9 credits toward the master's program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's program are not eligible to be applied to any other graduate degree program.

16. Are there admissions requirements for this program?:

Grade or grade-point average requirements and if so in which course(s), portfolio requirement, audition, essay, etc. If there are not admission requirements other than those required by the University policy indicate "none".

3.5 GPA

DEPARTMENT LEVEL APPROVAL STATUS

Approved: Department of Physiology

2/3/2014 1:35:48 PM by Richard Miksicek for Charles Leroy Cox, Chairperson

Comments: Approved for Physiology by R Miksicek, Director of Undergraduate Studies.

SIGNOFFS STATUS

No Response by: Lyman Briggs College

COLLEGE LEVEL APPROVAL STATUS

*Per Teri Roache
3-4-14
create BR
tracking in all
colleges*

Approved: College of Natural Science
2/18/2014 10:24:42 AM by Teri Roache for Richard Schwartz, Associate Dean

Approved: College of Human Medicine
2/3/2014 1:41:08 PM by Lisa Galbavi for Aron Sousa, Senior Associate Dean for Academic Affairs

Approved: College of Osteopathic Medicine
2/10/2014 3:56:08 PM by Robin Hastings for Gail D. Riegler, Associate Dean

Approved: College of Veterinary Medicine
2/3/2014 3:23:09 PM by Helene Pazak for Coretta Patterson, Associate Dean

© 2014 Office of the Registrar, Michigan State University Board of Trustees. East Lansing, MI 48824

MSU is an affirmative-action, equal-opportunity employer.

UNDERGRADUATE PROGRAM

The Bachelor of Science degree program in Physiology combines elements of a liberal education with thorough preparation in molecular, cellular, and organ systems physiology built on a foundation of biology, chemistry, physics, and mathematics. It is intended primarily for those students who wish to pursue careers in research, industry, medicine, or other health-related fields, for which a thorough knowledge of physiology is necessary. Students learn a broad range of topics in the field of contemporary molecular and cellular physiology and biomedical research. This major is particularly suitable for students in the life sciences who plan further studies at the graduate or professional level.

In order to increase the flexibility of the program and to foster a meaningful undergraduate experience, students are encouraged to participate in independent research under the supervision of a departmental faculty member. Independent research is available to both Honors College and other students, and often culminates in a written report or a presentation at the University Undergraduate Research Forum. This research may fulfill all or part of the department's capstone laboratory requirement for the bachelor's degree in physiology.

Students seeking admission to the program should complete a high school science or college preparatory curriculum, ensuring that their programs include courses required for admission to the university. Students are also encouraged to complete their preparatory biology, chemistry, mathematics, and physics courses early during their course of collegiate study.

Requirements for the Bachelor of Science Degree in Physiology

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Physiology.

The University's Tier II writing requirement for the Physiology major is met by completing Physiology 450 and one of the following courses: Physiology 420, 426, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, or 449. Those courses are referenced in item 3. b. below.

Students who are enrolled in the College of Natural Science may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading *Graduation Requirements* in the College statement. Certain courses referenced in requirement 3. below may be used to satisfy the alternative track.

2. The requirements of the College of Natural Science for the Bachelor of Science degree.

The completion of the Biological Science, Chemistry, Mathematics, and Physics courses referenced in requirement 3. below satisfies the requirements referenced in item 3.a.(1) through (5) under the heading *Graduation Requirements* in the College statement. The credits earned in other courses referenced in requirement 3. below may be counted toward other College requirements as appropriate.

3. The following requirements for the major:

CREDITS

- a. The following courses outside the Department of Physiology: ... 67 to 70

(1) All of the following courses (43 credits):	
BMB 461 Biochemistry I	3
BMB 462 Biochemistry II	3
BS 110 Organisms and Populations	4
BS 111 Cells and Molecules	3
BS 111L Cell and Molecular Biology Laboratory	2
CEM 141 General Chemistry	4
CEM 142 General and Inorganic Chemistry	3
CEM 161 Chemistry Laboratory I	1
CEM 162 Chemistry Laboratory II	1
CEM 251 Organic Chemistry I	3
CEM 252 Organic Chemistry II	3
CEM 255 Organic Chemistry Laboratory	2
CEM 383 Introductory Physical Chemistry I	3
PHY 231 Introductory Physics I	3
PHY 232 Introductory Physics II	3
PHY 251 Introductory Physics Laboratory I	1
PHY 252 Introductory Physics Laboratory II	1
(2) One of the following courses (3 or 4 credits):	
ANTR 350 Human Gross Anatomy and Structural Biology 3	
KIN 216 Applied Human Anatomy	3
ZOL 320 Developmental Biology	4
ZOL 328 Comparative Anatomy and Biology of Vertebrates (W)	4
(3) One of the following pairs of courses (6 or 7 credits):	
(a) MTH 132 Calculus I	3
MTH 133 Calculus II	4
(b) MTH 124 Survey of Calculus I	3
MTH 126 Survey of Calculus II	3

- (4) One of the following courses (3 or 4 credits):
 - STT 201 Statistical Methods 4
 - STT 231 Statistics for Scientists 4
 - PSL 410 Computational Problem Solving in
 Physiology 3
- (5) Twelve credits in nonscience courses beyond the credits that
 are counted toward University requirements.
- b. The following courses in the Department of Physiology: 13
 - (1) All of the following courses (11 credits):
 - PSL 431 Human Physiology I 3
 - PSL 432 Human Physiology II 3
 - PSL 450 Physiology in Health and Disease 3
 - PSL 475 Capstone Laboratory in Physiology 2
 The completion of Physiology 475 satisfies the department's
 capstone course requirement.
 - (2) One of the following courses (2 credits):
 - PSL 420 Membrane Biophysics: An Introduction (W) . . . 2
 - PSL 421 Adult and Embryonic Stem Cells (W) 2
 - PSL 426 Computational Problem Solving in
 Physiology II (W) 2
 - PSL 439 Special Topics in Physiology (W) 2
 - PSL 440 Topics in Cell Physiology (W) 2
 - PSL 441 Topics in Endocrinology (W) 2
 - PSL 442 Topics in Cardiovascular Physiology (W) 2
 - PSL 443 Topics in Respiratory Physiology (W) 2
 - PSL 444 Topics in Reproductive Physiology (W) 2
 - PSL 445 Topics in Environmental Physiology (W) 2
 - PSL 446 Topics in Sensory Physiology (W) 2
 - PSL 447 Topics of Brain Function (W) 2
 - PSL 448 Topics in Gastrointestinal Physiology (W) 2
 - PSL 449 Topics in Neurophysiology and Neural
 Development (W) 2

Insert ①

GRADUATE STUDY

The Department of Physiology is administered jointly by the colleges of Natural Science, Human Medicine, Osteopathic Medicine, and Veterinary Medicine. Study for the Master of Science or Doctor of Philosophy degree with a major in physiology may be administered by any one of the four colleges referenced above. Study for the Doctor of Philosophy degree with a major in physiology—environmental toxicology is administered by the College of Veterinary Medicine.

Students who are enrolled in master's or doctoral degree programs in the Department of Physiology may elect an Interdepartmental Specialization in Cognitive Science. For additional information, refer to the statement on *Interdepartmental Graduate Specializations in Cognitive Science* in the *College of Social Science* section of this catalog. For additional information, contact the Department of Physiology.

PHYSIOLOGY

The department offers work leading to the Doctor of Philosophy degree and in some cases to the Master of Science degree. The principal objectives of graduate education in physiology are to obtain broad, basic knowledge in the subject matter of this and related fields, and to obtain training in physiological research methods. Major emphasis is placed upon the completion by the student of original research which should provide a significant contribution to knowledge. The facilities and staff are particularly suited to offer training in the following areas of physiology: cellular and molecular physiology, endocrinology, the cardiovascular system, gastrointestinal physiology and metabolism, neurophysiology, respiration, radiobiology, lactation, renal function, reproduction, comparative physiology, and biophysics.

A manual available at the department graduate office contains information on admission policies, financial support, and requirements for the Master of Science and Doctor of Philosophy degree programs in physiology. Departmental graduate stipends are awarded on the basis of merit, subject to the availability of funds.

LINKED BACHELOR'S-MASTER'S DEGREE IN PHYSIOLOGY
Bachelor of Science Degree in Physiology
Master of Science Degree in Physiology

The department welcomes applications from Michigan State University Physiology undergraduate students in their junior and senior year. Admission applications must be made during the prior spring semester for an anticipated spring graduation or the prior fall semester for an anticipated fall graduation to allow admission before the final semester as a Physiology undergraduate. Admission to the program requires a minimum undergraduate grade-point average of 3.5 and an approved program of study for the Master of Science degree in Physiology at the time of admission. Admission to the Linked Bachelor's-Master's program allows the application of up to 9 credits toward the master's program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's program are not eligible to be applied to any other graduate degree program.

Master of Science

In addition to meeting the requirements of the university and of the College of Natural Science, Human Medicine, Osteopathic Medicine, or Veterinary Medicine, students must meet the requirements specified below.

Admission

An undergraduate major in physiology is not a prerequisite to graduate study. However, a broad background in the basic sciences, including biology, chemistry, physics, and mathematics (through calculus), is essential. The minimum requirements include one year of physiology, biology, or zoology; one year each of mathematics and physics; and chemistry through organic and quantitative analysis. A deficiency in these requirements may be removed by successfully completing appropriate courses as collateral work early in the graduate program. Admission is based upon evaluation of the student's past record, results of the Graduate Record Examination, and recommendations.

Requirements for the Master of Science Degree in Physiology

The student must complete 30 credits under Plan A (with thesis). The program of study is planned by the student in consultation with a major advisor and an advisory committee that includes no fewer than two additional faculty members. Usually work in one or more supporting areas is required in addition to that taken in the major field. Completion of an original research problem and the writing of an acceptable thesis based upon at least 8 credits of research are required.

Doctor of Philosophy

In addition to meeting the requirements of the university and of the College of Natural Science, Human Medicine, Osteopathic Medicine, or Veterinary Medicine, students must meet the requirements specified below.

Admission

Entry into the Doctor of Philosophy degree program requires that the student has a major advisor and has earned 30 graduate credits, or holds a Master of Science or professional degree, or has passed the departmental Comprehensive Examination.

Requirements for the Doctor of Philosophy Degree in Physiology

Students entering a doctoral program with advanced standing must meet with the guidance committee within the first two semesters of doctoral study. The committee is composed of at least four faculty members, in addition to the major advisor, and must include one representative from another department. The course work, research program, and overall requirements needed to qualify for candidacy for the degree are planned in consultation with the guidance committee. However, the student's Guidance Committee Report is approved by the committee only after the student has demonstrated the potential to do research. Such potential may be demonstrated by any of the following:

- a. previous attainment of a master's degree with a thesis
- b. previous publication of research results
- c. other documented evidence of research capability.

The student must pass the Comprehensive Examination within the first two years of graduate study. The Comprehensive Examination which tests the student's breadth of knowledge in physiology, is administered by the Graduate and Professional Course and Curriculum Committee. The student prepares a thesis research proposal and presents the proposal to the faculty at a seminar. The proposal must be acceptable to the guidance committee. While the program is in progress, the student meets periodically with the guidance committee for evaluation.

A dissertation based on original research outlined in the proposal must be submitted to, approved by, and defended in an oral examination before the guidance committee. The dissertation is expected to show evidence of originality in its conception and execution and must be written in a clear and logical manner. Typically, three or more years of study beyond the bachelor's degree are needed to meet these requirements.

BIOMOLECULAR SCIENCE GATEWAY - FIRST YEAR

Students are encouraged to apply for admission to the Ph.D. program through the BioMolecular Science Gateway – First Year, where students choose a doctoral major from any of six Ph.D. programs: biochemistry and molecular biology, cell and molecular biology, genetics, microbiology and molecular genetics, pharmacology and toxicology, or physiology. For additional information refer to the *College of Natural Science* section of this catalog.