

Reasonable and Moderate Extension (RME) Format**

FORMAT FOR PROPOSED ADDITION/ABOLITION, REALLOCATION, OR
RE-ESTABLISHMENT OF AN EDUCATIONAL UNIT, CURRICULUM, OR DEGREE

I. Program inventory

A. Current

<u>CIP</u>	<u>Major</u>	<u>Specialization/ Concentration</u>	<u>Degree</u>	<u>Unit</u>
26.0101	Biological Science	None	Master of Science	College of Science

B. Proposed

<u>CIP</u>	<u>Major</u>	<u>Specialization/ Concentration</u>	<u>Degree</u>	<u>Unit</u>
	Biological Science	MEDPREP	Master of Science	College of Science

II. Reason for proposed action

(See Attached)

III. Anticipated budgetary effects

None

IV. Arrangements to be made for (a) affected faculty, staff and students; and (b) affected equipment and physical facilities

Two sets of faculty will be involved in the institution of this specialization: MEDPREP and Biological Sciences faculty. Because all MEDPREP courses are regularly offered to current students in the post-baccalaureate program, there will be no change in the type or number of students in those classes. MEDPREP faculty members will advise each MEDPREP student, as is done for the current program. The courses required to complete the M.S in Biological Science with a MEDPREP concentration are specifically outlined for those faculty. A short training session for advisors will be implemented to assure a smooth transition for students that elect to complete the M.S. The only change for Biological Sciences faculty will be a slight increase in enrollment for those courses required by the degree (an estimated 3-7 additional students per year). There should be no affect on staff for either program. There will be no affected equipment or physical facilities.

V. Will other educational units, curricula, or degrees be affected by this action?

No. MEDPREP students will still have the option of the traditional MEDPREP/upper level science experience. No other units on campus will be affected.

VI. Any other relevant information

This type of program is currently being offered at a number of other schools throughout the country. (See Attached)

VII. Catalog copy to be deleted or added: (See Attached)

VIII. The requested effective date of implementation: August 2012

**This request is required to go through the office of the Associate Provost for Academic Programs before approval of the Faculty Senate and/or Graduate Council.

II. Reason for proposed action

The following list of points is the justification for the modification of this program:

- A graduate program such as this does not currently exist on the campus of SIUC.
- This would be a degree program that would be in demand by a selection of students that are currently enrolled on our campus in a post-baccalaureate program through the SIU School of Medicine (MEDPREP).
- Students within the post-baccalaureate program (MEDPREP) currently finish with only a certificate. This would allow these students to leave SIU with a marketable degree even if they do not matriculate to medical school.
- According to the US Department of Labor Occupational Outlook Handbook, a student with this degree would have a variety of options upon graduation:
Applied research, product development, product inspection, science technician, agriculture or food scientist, animal care, material scientist, health information technician, surgical technician, medical assistant, clinical laboratory technician, community college teaching,
- Or a student could continue his/her education with a professional degree:
medicine, physical therapy, optician, dentist, occupational therapy, pharmacy, chiropractor, podiatrist or veterinarian.

According to the Bureau of Labor Statistics, *Occupational Outlook Handbook, 2010-11 Edition*: Employment of biological scientists is expected to increase much faster than the average for all occupations although there will continue to be competition for some basic research positions. Employment is expected to grow much faster than average for medical technologists who are certified and for those who are willing to relocate. Job openings in community college teaching will stem from faster than the average employment growth and many expected retirements. Competition is expected for tenure-track positions; better opportunities are expected for part-time or non-tenure-track positions. Ph.D. recipients, science and mathematics should experience the best job prospects. Employment as a physician or surgeon is expected to grow much faster than the average for all occupations. Job opportunities should be very good, particularly in rural and low-income areas.

Summary of other program in the U.S.

Of the 48 programs listed by the AAMC as Post baccalaureate Premedical Programs across the United States, 29 of those programs are master level, degree granting programs and 21 are certificate programs. Only two programs are listed in the State of Illinois: a Master of Arts at Loyola University in Chicago and our own MEDPREP at SIU. The costs vary from \$5000 – over \$25,000 per year or \$200 - \$800 per credit hour. SIU falls in the lower range of tuition at approximately \$13,500 per year.

**Biological Sciences Program
M.S. Biological Science
MEDPREP Concentration
College of Science, SIUC
Assessment Plan
December, 2011**

Program Objectives and General Student-Learning Outcomes

As of fall, 2012, the Biological Science Program will offer a Master of Science with a concentration in MEDPREP.

1. Biological Sciences will provide the Master of Science in Biomedical Science and MEDPREP will provide the concentration.
 - a. **Biomedical Science** is for students seeking entry into health-care professions. It is designed to match the requirements for admission to medical school, but is broadly applicable to other professional- and graduate-school programs in human health and biomedical research. The track serves the documented need for health care workers and researchers in Illinois and the U.S.
 - b. **MEDPREP** is a post-baccalaureate program administered through the School of Medicine. It is designed to assist pre-medical students in the preparation for the Medical College Admissions Test (MCAT), guide these students through the admissions process for medical school, and provide course work to lay the foundation for courses the students will encounter in medical school.

2. Life science departments (Microbiology, Physiology, Plant Biology, and Zoology) and MEDPREP will provide core courses at the graduate level that will provide the student with a substantial basis of knowledge for acceptance into and successful completion of medical school.

(See attached course requirements)

3. Through the mentoring efforts of its faculty, MEDPREP will provide students with academic advisement and career counseling, as well as opportunities to shadow within the medical field appropriate for their professional goals.
 - a. Professionalism within the medical profession
 - b. Assessment of medical schools vs goals of the student
 - c. Long term career specialty assessment
 - d. Learning and study strategies
 - e. Personal development

Program Assessment Tools

Data on the following indicators will be tabulated annually and year-to-year trends monitored.

1. **Student demand and program productivity:** numbers of majors in the Master of Science in Biological Sciences program with the concentration MEDPREP.
2. **Student performance in the biological science content areas of microbiology, biochemistry, physiology, molecular biology, and anatomy.**
 - a. Overall and major GPAs of Master of Science in Biological Sciences/MEDPREP students each semester.
3. **Student performance in the MEDPREP content areas of general biology, chemistry, physics, and verbal reasoning.**
 - a. Overall and major GPAs of Master of Science in Biological Sciences/MEDPREP students each semester.
4. **Student performance in areas of social sciences pertinent to health professions.**
 - a. Overall and major GPAs of Master of Science in Biological Sciences/MEDPREP students each semester.
5. **Student professional success:** numbers and proportions of Master of Science in Biological Sciences/MEDPREP students in each year's graduating class who matriculate into a health professions school.
6. **MEDPREP course effectiveness:** every MEDPREP course has an assessment plan that includes an alignment of objectives (content, skills, and dispositions) with student-performance evaluations; periodic peer-review of course structure and delivery.
 - a. Evaluation to determine the amount of course content learned.
 - b. Evidence of skills necessary for the student to be successful on the MCAT or in a medical school curriculum.
 - c. Evidence of professional behaviors conducive of a health professional.

Assessment Feedback and Program Management

MEDPREP course instructors will assemble the assessment data for individual courses within one semester of course completion. All other data will be assembled by the Chief Academic Advisor, MEDPREP.

Assessment data will be reviewed by the MEDPREP Advisory Committee, which will meet at least once each semester. MEDPREP course instructors will be invited to attend these meetings and participate in the discussion of assessment data. The committee will note strengths and weaknesses evident in the data and suggest strategies for program enhancement based on the data. The MEDPREP Chief Academic Advisor will prepare an annual assessment report for the Director of MEDPREP which, upon conferring with the faculty, will have approval authority for program changes.

Effects of specific program changes will be specifically evaluated from assessment data for subsequent years.

Summer 1Required for MEDPREP:

MEDP 401A	Academic Enrichment	1 hour
MEDP 401E	Career Development	1 hour
MEDP 401F	Verbal Reasoning	1 hour
MEDP 403G	Biology Applications	1 hour
MEDP 404A	Chemistry Applications	1 hour
MEDP 405A	Physics App/Quant	1 hour
Total		6 hours

Fall 1Required for MEDPREP:

MEDP 400A	Orientation	1 hour
MEDP 401E	Convocation	1 hour
<u>Suggested for MEDPREP:</u>		
MEDP 401G	Verbal Reasoning	1 hour
MEDP 401C	Quant Skills	1 hour
MEDP 403G	Biology App	2 hour
MEDP 404A	Chemistry App	2 hour
MEDP 405A	Physics App	1 hour

Required for M.S. (pick one)

BCHM 451A	Biochemistry	3 hours
MBMB 425	Biochem/Phy	3 hours
PHSL 310	Human Phys	<u>5 hours</u>
Total		11-17 hours

*(could also add with one of above: PHSL 310)*Required for M.S. (pick one)

BCHM 451B	Biochemistry	3 hours
Chem 350	Biochemistry	3 hours
PHSL 301	Human Anatomy	<u>4 hours</u>
Total		11-15 hours

Spring 1Required for MEDPREP:

MEDP 400B	Medical Seminar	1 hour
MEDP 401E	Convocation	1 hour
<u>Suggested for MEDPREP:</u>		
MEDP 401H	Verbal Reasoning	1 hour
MEDP 403G	Biology App	2 hour
MEDP 404C	Chemistry App	2 hour
MEDP 405A	Physics App	1 hour

Summer 2Required for MEDPREP:

MEDP 401E	Convocation	1 hour
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Required for M.S.

<u>Pick one class from the following:</u>		
PHSL 410A	Mammalian	4 hours
PHSL 401A	Anatomy	5 hours
PHSL 433A	Comp Phys	3 hours
PHSL 470	Biol Clocks	3 hours
MBMB 460	Bac/Viral Gen	3 hours

Spring 2Required for MEDPREP:

MEDP 401E	Convocation	1 hour
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Required for M.S.

<u>Pick one class from the following:</u>		
PHSL 410B	Mammalian	4 hours
PHSL 401B	Anatomy	5 hours
PHSL 430	Cell/Mole	3 hours
ZOOL 409	Histology	4 hours
MBMB 403	Med Micro	3 hours
MBMB 405	Clinical Micro	3 hours
MBMB 441	Virus/Disease	3 hours
MBMB 453	Immunology	3 hours

Pick 3 classes from:

MBMB 520	Ad Micro Phys	2 hours
MBMB 510	Pub Health	3 hours
MBMB 531, 533, or 560	Mol/Bio/Oncol	3 hours each
PHSL 511A		5 hours
PHSL 573	Neuro	3 hours
MEDP 503B, 503E	Pharm/Immuno	<u>2 hours each</u>
Total		11- 15 hours

Pick 3 classes from (must end up with 15 500 level credit hours):

PHSL 530	Cell Phsl	3 hours
HED 583, 593	Health/Epid	3 hours each
PSYC 511	Memory	3 hours
PHSL 511B		5 hours
MEDP 504E	Med Biochem	<u>2 hours</u>
Total		10-14 hours

If a student takes the minimum number of required hours for the M.S., the student will have 21 hours of 400 level coursework and 15 hours of 500 level coursework for a total of 36 hours. All other courses are suggested.

Fall				Spring			
Course No	Course Name	Pre-reqs	Hours	Course No	Course Name	Pre-reqs	Hours
MBMB 425	Biochem/Phys Micro	Chem 340	3 hours	MBMB 403	Medical Micro	Micro 301	3 hours
BCHM 451 A	Biochemistry	Chem 340/342	3 hours	MBMB 405 (Not every spring)	Clinical Micro	Micro 301	3 hours
MBMB 460	Bac/Viral Genetic	MICR301/302	3 hours	MBMB 441(Not every spring)	Virus and Disease	MBMB 460	3 hours
MBMB 510	Functions of Pub Health		3 hours	BCHM 451B	Biochemistry	Chem 340/342	3 hours
MBMB 520 (Not every fall)	Ad Micro Phys	MBMB 425 or MBMB 451AB	2 hours	MBMB 453	Immunology	MBMB 403	3 hours
MBMB 531	Molecular/Cell	MBMB 451B/460	3 hours	PHSL 401B	Human Anatomy	PHSL 401A	5 hours
MBMB 533(Not every fall)	Advanced Biochem	MBMB 451A	3 hours	PHSL 410B	Mammalian Phys	Gen Chem/Col Physics	4 hours
MBMB 560(Not every fall)	Molecular Oncology	MBMB 451A/B	3 hours	PHSL 430	Cell/Mole Phsl	Biol200/Chem350	3 hours
PHSL 401A	Human Anatomy	Phsl 301	5 hours	PHSL 530	Adv Cell Phsl	Approval	3 hours
PHSL 410A	Mammalian Phys	Gen Chem/Col Physics	4 hours	MEDP 504E	Medical Biochem		2 hours
PHSL 433A	Comparative Phys	Biol 200	3 hours	Zool 409	Histology	Zool 220	4 hours
PHSL 470	Biological Clocks	PHSL 310	3 hours	HND 470	Medical Nutrition	Chem 140, PHSL 201, HND 320	4 hours
PHSL 573(Not every fall)	Neuroanatomy		3 hours	HND 425	Nutritional Bioche		3 hours
PHSL 575 (Not every fall)	Neuroendocrinology	PHSL 410A/B	3 hours	HED 583	US Health Care Sys		3 hours
MEDP 503B	Medical Pharm		2 hours	HED 593	Epidemiology		3 hours
MEDP 503E	Medical Immunology		2 hours	PSYC 511	Learn & Memory		3 hours

BIOLOGICAL SCIENCES

COLLEGE OF SCIENCE

The biological sciences program provides broad interdisciplinary graduate training in biology leading to the Master of Science degree. This interdisciplinary program utilizes the faculty, facilities and courses of the Departments of Microbiology, Physiology, Plant Biology and Zoology. The program is designed for those students who desire a broad-based curriculum rather than an in-depth concentration in only one of the biological sciences.

Requirements for Admission

All applicants must submit an application to the biological sciences program. Applicants must meet the minimal requirements of the Graduate School before being considered for admission to Biological Sciences. A completed application includes the program application form, three letters of recommendation, transcripts of all previous college credit, and scores from the general aptitude portion of the Graduate Record Examination (GRE).

This program requires a nonrefundable \$50.00 application fee that must be submitted with the application for Admissions to Graduate Study in Biological Sciences. Applicants may pay this fee by credit card if applying electronically. Applicants submitting a paper application must pay by personal check, cashier's check, or money order made out to SIU, and payable to a U.S. bank.

In addition to Graduate School admission requirements, applicants must hold a bachelor's degree in a life-science discipline. Specific options and concentrations may have additional prerequisites, as noted below.

Application forms are available online at <http://www.gradschool.siu.edu/applygrad.html>.

Non-Thesis Option

Admission requirements: 37 semester hours of undergraduate courses distributed among any three of the biological science areas (plant biology, microbiology, physiology and zoology); organic chemistry with laboratory; physics; statistics. Applicants deficient in these background areas may be admitted, but any deficiency must be successfully completed before the third semester of registration in the program.

Advisement: No later than the end of the first semester of registration in the program, the student must arrange with a faculty member in one of the four biological science departments to serve as the research adviser. Following selection and approval of the adviser, an advisory committee is to be recommended to the director of the Biological Sciences Program for approval by the dean of the Graduate School. This committee shall consist of at least three members, each from a different biological science department, with the research advisor serving as chair. A program of course work must be approved by the advisory committee and filed with the director no later than the eighth week of the second semester of registration in the program. Any deviation from the course work program during the student's tenure must be approved by the advisory committee and filed with the director. A proposal for the research paper must be approved by the advisory committee and filed with the director no later than the end of the second semester of registration.

Graduation requirements include a total of 40 semester hours of 400- or 500-level courses with the following provisions:

1. A minimum of 26 semester hours of formal graded courses in the biological sciences required with no less than eight semester hours including one 400- or 500-level laboratory courses in each of three of the biological sciences departments.
2. At least 15 semester hours of the total required must be at the 500 level.
3. At least one semester of seminar in each of three of the biological sciences departments must be attended for credit.
4. An overall 3.0 grade point average (A = 4.0) must be maintained with no course in which the grade is less than a C counting toward the degree requirements.
5. A research paper is required demonstrating the ability to collect and analyze data and to report interpreted results in a scientific manner. A library research problem is acceptable, but must include an original contribution of analysis and interpretation. No less than three nor more than six semester hours of "Research" may be counted for credit in meeting requirement. (*Only those courses listed as "individual Research", Introduction to Research", etc. may be taken for credit. "Thesis Research" may not be used for this requirement.*)
6. A final oral examination is required, consisting of two parts:
 - a. A public presentation of the research paper and
 - b. A close session of inquiry by the student's Research and Advisory Committee

MEDPREP Concentration (Non-Thesis)

Admission requirements: Each student must apply and be accepted to the MEDPREP program in the SIU School of Medicine.

Advisement: students are advised by MEDPREP faculty in the SIU School of Medicine. Advisement arrangements are made immediately after admission.

Graduation requirements include a minimum of 47 semester hours of 400- or 500-level courses with the following provisions:

1. A minimum of 20 semester hours of formal course work in the biological sciences and 12 hours of formal course work in MEDPREP.
2. At least 15 semester hours of the total required must be at the 500 level.
3. A minimum of 12 semester hours of course work in MEDPREP (6 of those hours to be completed during the summer prior to matriculation into the Biological Science program.
4. An overall 3.0 grade point average (A = 4.0) must be maintained with no course in which the grade is lower than a C counting toward the degree requirements.

Thesis Option

Admission requirements: 37 semester hours of undergraduate courses distributed among any three of the biological science areas (plant biology, microbiology, physiology and zoology); organic chemistry with laboratory; physics; statistics. Applicants deficient in these background areas may be admitted, but any deficiency must be successfully completed before the third semester of registration in the program.

Advisement: No later than the end of the first semester of registration in the program, the student must arrange with a faculty member in one of the four biological science departments to serve as the research adviser. Following selection and approval of the adviser, an advisory committee is to be recommended to the director of the Biological Sciences Program for approval by the dean of the Graduate School. This committee shall consist of at least three members, each from a different biological science department, with the research advisor serving as chair. A program of course work must be approved by the advisory committee and filed with the director no later than the

eighth week of the second semester of registration in the program. Any deviation from the course work program during the student's tenure must be approved by the advisory committee and filed with the director. A research proposal for the thesis must be approved by the advisory committee and filed with the director no later than the end of the second semester of registration.

Graduation requirements include a total of 30 semester hours of 400- or 500-level courses with the following provisions:

1. A minimum of 21 semester hours of formal graded courses in the biological sciences is required with no less than six semester hours coming from each of the three biological science departments.
2. At least 15 semester hours of the total required must be at the 500 level.
3. At least one semester of seminar in two of the four biological science departments must be attended for credit.
4. An overall 3.0 grade point average ($A = 4.0$) must be maintained with no course in which the grade is lower than a C counting toward the degree requirements.
5. A thesis embodying original research is required and may be counted for not less than three nor more than six semester hours of credit.
6. A final oral examination is required consisting of a public presentation of the thesis research and a closed session of inquiry by the student's research and advisory committee.



PROGRAM DESCRIPTION (Academic Requirements)

Formerly Form 90A

Southern Illinois University Carbondale

This form should be used for requesting changes in requirements of a degree granting unit, major, minor, concentration, specialization, certification program and miscellaneous changes of any academic program. (See instructions)

1. This change is for: Graduate Catalog

2. Name of units, department:

- a. Degree granting academic unit (College or School) College of Science
- b. Department or Division Biological Sciences
- c. Degree Type (BS, MS, etc) MS
- d. Major Biological Sciences
- e. Minor _____
- f. Concentration MEDPREP
- e. Specialization _____

3. Brief Summary of Change (Use additional page if necessary):

Modification of non-thesis M.S. option to include a concentration in MEDPREP.

4. Specific Changes:

If changes are editorial and minor, please make a copy of the actual catalog page(s) with corrections made on the copy and attach to this form. If changes are extensive, please type new catalog copy on white bond paper, double spaced, outlining what you recommend for the appropriate catalog and attach to this form.

5. Effective term will be the next published catalog: _____ (Transfer Student Services Use Only)

(All exceptions require Provost approval)

6. Approved:

- a. Department Executive Officer Carey Krajewski Digitally signed by Carey Krajewski
DN: cn=Carey Krajewski, o=Southern Illinois University, ou=Department of Zoology,
email=careyk@siu.edu, c=US
Date: 2011.10.14.14:11:20 -0500 14 Oct 2011
Date
- b. Dean [Signature] 12-5-11
Date
- c. Dean of the Graduate School _____
Date
- d. Associate Provost for Academic Programs _____
Date

7. Transfer Student Services: _____
Date