# Proposal Summary and Routing Form

**Proposal Title:** Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiating Unit or Individual: Dr. Joseph Lipar  
Contact Person's Name: Dr. Joseph Lipar  
e-mail: liparj1@ferris.edu  
phone: 591-2660

- Group I - A – New degree/major or major, redirection of a current offering, or elimination of a degree, major or minor
- Group I - B – New minors or concentrations
- Group II - A – Minor curriculum clean-up and course changes
- Group II - B – New Course
- Group III - Certificates
- Group IV – Off-Campus Programs

<table>
<thead>
<tr>
<th>Group/Individual</th>
<th>Signature</th>
<th>Date</th>
<th>Vote/Action *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program or Academic Unit Faculty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department Faculty</td>
<td></td>
<td>11/24/11</td>
<td>7 Support</td>
</tr>
<tr>
<td>Department Head</td>
<td></td>
<td>11/24/11</td>
<td>0 Not Support</td>
</tr>
<tr>
<td>College Curriculum Committee</td>
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<td>12/11/11</td>
<td>5 Support</td>
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<td>Senate</td>
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<tr>
<td>Academic Affairs</td>
<td></td>
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</tr>
</tbody>
</table>

*Support with Concerns or Not Support must include a list of specific concerns. Votes must be shown for faculty groups. Administrators check appropriate action taken.*

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To be completed by Academic Affairs

President (Date Approved)  
Board of Trustees (Date Approved)  
President's Council (Date Approved)

JAN 1 1 2011  
PROVOST
1. Proposal Summary

(Summary is generally less than one page. Briefly: state what is proposed with a summary of rationales and highlights. Additional rationale may be attached.)

We propose to create a new concentration, Pre-Pharmacy (BIPP), under the umbrella of the Bachelor of Science Degree in Biology. This proposal is being made for several reasons:

1) The College of Pharmacy at Ferris State University will be changing their admission requirements such that applicants will have to complete approximately three years of undergraduate coursework instead of two years, which is currently required. Specifically, coursework that will be added to the list of prerequisites includes BIOL 375 (Genetics), CHEM 324 (Fundamentals of Biochemistry), PHYS 211 (Introductory Physics I), and MATH 251 (Statistics for the Life Sciences). Each of these courses fits into the framework of our B.S. in Biology checksheet, and each is commonly taken by students in all of our concentrations. The addition of these requirements means that students who complete all of the prerequisites for the College of Pharmacy will have already completed nearly 70% of the coursework required for a B.S. in Biology. The changes to the admission requirements for the College of Pharmacy are being made upon the recommendation of a task force that included faculty and administration from the College of Arts and Sciences.

2) Many pharmacy programs already require at least three years of undergraduate pre-pharmacy coursework, and approximately 20% of those programs require a completed undergraduate degree prior to admission.

3) Every year, approximately 20 students who had applied to the College of Pharmacy but were not accepted return to pursue an undergraduate degree in Biology. Many of those students still intend to apply to a pharmacy school after completing that degree. Those students would be well-served by the addition of a concentration in Pre-Pharmacy because a) they would have a specific checksheet to follow and therefore would receive more consistent advice from our faculty advisors, and b) the completion of a degree in Pre-Pharmacy could make them more attractive candidates for admission into a school of pharmacy.

4) For those pre-pharmacy students who decide to pursue a bachelor’s degree, a B.S. in Biology would be the most efficient and direct path for them to achieve that goal.

3) The addition of a B.S. Biology with a Pre-Pharmacy Concentration will serve as a recruiting tool and will generate more interest in potential undergraduate students.

In addition to having the option of pursuing a more general B.S. in Biology (with no particular concentration), our students currently have the option of pursuing a B.S. in Biology in one of seven different concentration areas (Environmental Biology, Forensic Biology, Pre-Dentistry, Pre-Medicine, Pre-Optometry, Pre-Physical Therapy, and Pre-Veterinary Medicine). Each of these concentrations is designed to prepare students for success in their particular field of biology or medicine. We feel that a significant number of students would benefit from the addition of a concentration in Pre-Pharmacy, for the reasons described above.

Specific Requirements of the Program (See Attached Proposed Checksheet)

In addition to the specific admissions requirements of the College of Pharmacy at Ferris State University (indicated on the proposed checksheet with asterisks), students in the B.S. Biology (Pre-Pharmacy) Program would have to complete the following requirements:

- BIOL 346 (Ecological Assessment), BIOL 347 (Environmental Conservation), or BIOL 442 (Ecology)
- BIOL 460 (Current Topics in Biology)
- Nine (9) Credits of courses in BIOL numbered 300 or above
- PHYS 212 (Introductory Physics 2)
- One course that will satisfy the requirements of the Biology Application Area (as with all of our other concentrations in the B.S. Biology degree, courses that satisfy this requirement are determined through discussions between the student and the advisor)
- One 300-level ENGL course
- One course that satisfies the requirements of Social Awareness
- Electives such that a minimum of 121 credit hours is achieved
Note: Anatomy and Physiology - Although the College of Pharmacy at Ferris State University will accept either BIOL 205/206 or BIOL 321/322, we would like the students in our program to complete the BIOL 321/322 sequence, as we feel it will better prepare them for future coursework and success in their career.

Note: Because a course in cell biology is required by some pharmacy schools, we have added a recommended biology elective (either BIOL 373 – Cell Biology or BIOL 474 – Advanced Cell-Molecular Biology) to the checksheet. If students are considering application to a school of pharmacy that requires a course in cell biology, they will be advised to take one of those two courses.

Degree Completion Option

We propose that an additional option be incorporated into the program such that students who have completed all of their coursework except for the 9 credits in 300+ BIOL electives could receive their B.S. in Biology (Pre-Pharmacy) upon completion of that coursework after being admitted to the College of Pharmacy at Ferris State University.

Specific courses that could be transferred back include PHAR 311 (Medical Biochemistry), PHAR 312 (Molecular Biochemistry and Biotechnology), PHAR 315 (Pathophysiologic Basis for Therapeutics I), PHAR 316 (Pathophysiologic Basis for Therapeutics II), PHAR 428 (Pharmacokinetics), PHAR 411 (Drug Action 1), PHAR 412 (Drug Action 2), PHAR 413 (Drug Action 3), PHAR 414 (Drug Action 4), PHAR 421 (Infectious Disease 1), and PHAR 422 (Infectious Disease 2).

It will be required of all students that they formally apply for their B.S. in Biology during the first or second year of the pharmacy program so that retention statistics for the Biology Department are not negatively affected. This would ensure that those students will be receiving their B.S. in Biology no more than 5 years after starting the program. All of the PHAR courses listed above are taken during the first or second year of the pharmacy program.

The allowance for this option requires that one additional item must be changed on the proposed checksheet. Currently, all of our B.S. Biology checksheets include a requirement that 50% of the credits earned in the major must be earned at Ferris State University. (Residency Requirement: 30 minimum FSU semester credits, at least 50% FSU semester credits in major.) We propose to change that requirement somewhat for the Pre-Pharmacy concentration only such that it reads: Residency Requirement: 30 minimum FSU semester credits, at least 50% of credits in major must have a BIOL prefix and be earned at FSU.

Additional Note

Currently, pre-pharmacy students are placed into the A.S in Science (Pre-Pharmacy) program. It is expected that that program will be eliminated, as the new requirements for admission to the College of Pharmacy at Ferris exceed what should be required for an Associate’s Degree. A proposal to eliminate that program would be submitted by the College of Arts and Sciences.

2. Summary of All Course Action Required*

   a. Newly Created Courses to FSU:
      Prefix   Number   Title
      BIOL 121   General Biology 1
      BIOL 122   General Biology 2
      BIOL 286   General Microbiology
      BIOL 321   Human Anatomy and Physiology 1
      BIOL 322   Human Anatomy and Physiology 2
      BIOL 346   Biological Assessment
BIOL 347  Environmental Conservation
BIOL 373  Cell Biology
BIOL 375  Genetics
BIOL 442  Ecology
BIOL 460  Current Topics in Biology
BIOL 474  Advanced Cell-Molecular Biology
MATH 135  Calculus for the Life Sciences
MATH 220  Analytical Geometry and Calculus 1
MATH 251  Statistics for the Life Sciences
CHEM 121  General Chemistry 1
CHEM 122  General Chemistry 2
CHEM 321  Organic Chemistry 1
CHEM 322  Organic Chemistry 2
CHEM 324  Fundamentals of Biochemistry
CHEM 364  Biochemistry
PHYS 211  Introductory Physics 1
PHYS 212  Introductory Physics 2
MATH 251  Statistics for the Life Sciences
ENGL 150  English 1
ENGL 250  English 2
ENGL 311  Advanced Technical Writing
ENGL 321  Advanced Composition
ENGL 323  Proposal Writing
COMM 121  Fundamentals of Public Speaking
PSYC 150  Introduction to Psychology
SOCY 121  Introduction to Sociology
ECON 221  Principles of Macroeconomics

e. Removal of existing FSU courses from program
Prefix   Number    Title

3. Summary of All Consultations

<table>
<thead>
<tr>
<th>Form Sent (B or C)</th>
<th>Date Sent</th>
<th>Responding Dept.</th>
<th>Date Received &amp; by Whom</th>
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<td>Humanities</td>
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<tr>
<td>C</td>
<td></td>
<td>Library</td>
<td></td>
</tr>
</tbody>
</table>

4. Will External Accreditation be Sought? (For new programs or certificates only)

__________ Yes  _______ X  No

If yes, name the organization involved with accreditation for this program.

5. Program Checksheets affected by this proposal.

B.S. in Biology (Pre-Pharmacy)
CURRICULUM CONSULTATION FORM

To be completed by each department affected by the proposed change, new degree, new program, new minor, or new course. Potential duplication of coursework is reason for consultation.

1. This completed form must be forwarded with the proposal to the chair/head of the department to be consulted.

2. The department must respond within 20 calendar days of receipt of this form to insure inclusion in the final proposal. The completed form is returned to the initiator and inserted into the proposal.

   Failure to respond is interpreted as support for the proposal.

3. The Proposing Department must address any concerns raised by the department. This response will be in writing and be included in the proposal following the consultation form.

RE: Proposal Title  Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiator(s): Joseph Lipar
Proposal Contact: Joseph Lipar Date Sent: 11/22/11
Department: Biological Sciences  Campus Address: ASC 2004
(Please print)

Responding Department: Humanities
Chair/Head/Coordinator: Trinidy Williams  Date Returned: _____

Based upon department faculty review on ____ (date), we

☐ Support the above proposal.
☐ Support the above proposal with the modifications and concerns listed below.
☐ Do not support the proposal for the reasons listed below.

Comment regarding the impact this proposal has on scheduling, room assignments, faculty load, and prerequisites for your department. Use additional pages, if necessary.
CURRICULUM CONSULTATION FORM

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RE: Proposal Title  Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiator(s): Joseph Lipar

Proposal Contact: Joseph Lipar Date Sent: 11/22/11

Department: Biological Sciences  Campus Address: ASC 2004
(Please print)

Responding Department: Languages and Literature

Chair/Head/Coordinator: Sandra Balkema  Date Returned: _____

Based upon department faculty review on _____(date), we

☐ Support the above proposal.
☐ Support the above proposal with the modifications and concerns listed below.
☐ Do not support the proposal for the reasons listed below.

Comment regarding the impact this proposal has on scheduling, room assignments, faculty load, and prerequisites for your department. Use additional pages, if necessary.
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RE: Proposal Title  Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiator(s): Joseph Lipar

Proposal Contact: Joseph Lipar Date Sent: _____

Department: Biological Sciences Campus Address: ASC 2004
(Please print)

Responding Department: Mathematics

Chair/Head/Coordinator: Kirk Weller Date Returned: 12/10/11

Based upon department faculty review on 10/14/11, we

☐ Support the above proposal.
☒ Support the above proposal with the modifications and concerns listed below.
☐ Do not support the proposal for the reasons listed below.

Comment regarding the impact this proposal has on scheduling, room assignments, faculty load, and prerequisites for your department. Use additional pages, if necessary.

The Mathematics Department is currently in the process of making revisions. This will likely result in Calculus I being changed from a 5 credit to 4 credit course and the possible phasing out of MATH 135. We would prefer for BIPP students to take the new 4-cr calculus course.
CURRICULUM CONSULTATION FORM

To be completed by each department affected by the proposed change, new degree, new program, new minor, or new course. Potential duplication of coursework is reason for consultation.

1. This completed form must be forwarded with the proposal to the chair/head of the department to be consulted.

2. The department must respond within 20 calendar days of receipt of this form to insure inclusion in the final proposal. The completed form is returned to the initiator and inserted into the proposal.
   
   Failure to respond is interpreted as support for the proposal.

3. The Proposing Department must address any concerns raised by the department. This response will be in writing and be included in the proposal following the consultation form.

RE: Proposal Title Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiator(s): Joseph Lipar

Proposal Contact: Joseph Lipar Date Sent: 11/22/11

Department: Biological Sciences Campus Address: ASC 2004
(Please print)

Responding Department: Humanities

Chair/Head/Coordinator: Trinidy Williams Date Returned: 1/3/12

Based upon department faculty review on 12/20/11 (date), we

X Support the above proposal.

☐ Support the above proposal with the modifications and concerns listed below.

☐ Do not support the proposal for the reasons listed below.

Comment regarding the impact this proposal has on scheduling, room assignments, faculty load, and prerequisites for your department. Use additional pages, if necessary.
CURRICULUM CONSULTATION FORM

To be completed by each department affected by the proposed change, new degree, new program, new minor, or new course. Potential duplication of coursework is reason for consultation.

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2. The department must respond within 20 calendar days of receipt of this form to insure inclusion in the final proposal. The completed form is returned to the initiator and inserted into the proposal.

   Failure to respond is interpreted as support for the proposal.

3. The Proposing Department must address any concerns raised by the department. This response will be in writing and be included in the proposal following the consultation form.

RE: Proposal Title  Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiator(s): Joseph Lipar
Proposal Contact: Joseph Lipar Date Sent: 11/22/11
Department: Biological Sciences  Campus Address: ASC 2004
(Please print)

Responding Department: College of Pharmacy
Chair/Head/Coordinator: Greg Wellman  Date Returned: ______

Based upon department faculty review on ____ (date), we

☐ Support the above proposal.
☐ Support the above proposal with the modifications and concerns listed below.
☐ Do not support the proposal for the reasons listed below.

Comment regarding the impact this proposal has on scheduling, room assignments, faculty load, and prerequisites for your department. Use additional pages, if necessary.
FORM B
Rev.7/23/07

CURRICULUM CONSULTATION FORM

To be completed by each department affected by the proposed change, new degree, new program, new minor, or new course. Potential duplication of coursework is reason for consultation.

1. This completed form must be forwarded with the proposal to the chair/head of the department to be consulted.

2. The department must respond within 20 calendar days of receipt of this form to insure inclusion in the final proposal. The completed form is returned to the initiator and inserted into the proposal.

Failure to respond is interpreted as support for the proposal.

3. The Proposing Department must address any concerns raised by the department. This response will be in writing and be included in the proposal following the consultation form.

RE: Proposal Title  Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Initiator(s): Joseph Lipar
Proposal Contact: Joseph Lipar  Date Sent: 11/22/11
Department: Biological Sciences  Campus Address: ASC 2004
(Please print)

Responding Department: Physical Sciences
Chair/Head/Coordinator: David Frank  Date Returned: ___

Based upon department faculty review on ___(date), we

☐ Support the above proposal.
☐ Support the above proposal with the modifications and concerns listed below.
☐ Do not support the proposal for the reasons listed below.

Comment regarding the impact this proposal has on scheduling, room assignments, faculty load, and prerequisites for your department. Use additional pages, if necessary.
FLITE SERVICES CONSULTATION FORM

To be completed by the liaison librarian and approved by the Dean of FLITE. All returned forms should be included in the proposal. FLITE must respond within 20 calendar days of receipt of this form to insure that the form is included in the final proposal.

FAILURE TO RESPOND IS CONSIDERED AS SUPPORT OF THE CHANGE.

RE: Proposal Title: Creation of New Concentration in Biology: B.S. Biology (Pre-Pharmacy)

Projected number of students per year affected by proposed change: 125

Initiator(s): Dr. Joseph Lipar

Proposal Contact: Dr. Joseph Lipar Date Sent: __________

Department: Biological Sciences Campus Address: ASC 2004
(Please print)

Liaison Librarian Signature: [Signature] Date: 11/28/11

Dean of FLITE Signature: [Signature] Date Returned: 11-29-11

Based upon our review on 11/28/11 (date), FLITE concludes that:

☐ Library resources to support the proposed curriculum change are currently available.

☐ Additional Library resources are needed but can be obtained from current funds.

☐ Support, but significant additional Library funds/resources are required in the amount of $__________.

☐ Does not support the proposal for reasons listed below.

Comment regarding the impact this proposal will have on library resources, collection development, programs, etc. Use additional pages if necessary.
**PRE-PHARMACY**  
**BACHELOR OF SCIENCE IN BIOLOGY**

**FERRIS STATE UNIVERSITY**  
**LEAD ADVISOR: ANGIE MISHLER**  
**OFFICE: ASC 3078 PHONE: (231) 591-2745 E-MAIL: mishlera@ferris.edu FAX: (231) 591-2618**

Admission requirements: First year student admission is open to high school graduates (or equivalent) who demonstrate appropriate academic preparedness, maturity and seriousness of purpose. High school courses and grade point average, ACT composite score, and ACT Mathematics and Reading sub scores will be considered in the admission and course placement process. Transfer students must have at least 12 credits at the time of application with a minimum 2.0 overall GPA including an English and mathematics course or they will be considered as first year students.

The following program presents the minimum entrance requirements of the College of Pharmacy and the requirements for the Bachelor of Science in Biology. Students may be eligible to apply if they have credit in specific courses as indicated on this checksheet. Admission to the College of Pharmacy is highly competitive, and the completion of this program does not ensure acceptance. Admission requirements for other schools of Pharmacy may vary.

Graduation Requirements:
1. 2.0 CUMULATIVE Grade Point Average in all coursework.
2. No grade lower than C- in courses that apply to major, supporting sciences, and biology application area.
3. Residency Requirement: 30 minimum FSU semester credits, at least 50% of credits in major must have a BIOL prefix and be earned at FSU.
4. Minimum of 40 credits numbered 300 or higher.
5. 121 minimum semester credits including general education requirements.
6. Students may earn only one degree in Biology (either B.S. or B.A.) from Ferris State University.

**Program Requirements:** Effective for students entering the Pre-Pharmacy Concentration Fall Semester 2012 [Note: Courses marked with an asterisk satisfy the minimum admission requirements of the College of Pharmacy at Ferris State University.]

### Required Courses

<table>
<thead>
<tr>
<th>REQUIRED</th>
<th>COURSE TITLE – See FSU catalog course descriptions for prerequisites not indicated below</th>
<th>Credit</th>
<th>Grade</th>
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<tbody>
<tr>
<td>MAJOR – 36 Credit Hours Required</td>
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<tr>
<td>*BIOL 121</td>
<td>General Biology 1 (CHEM 114 or CHEM 121 concurrent)</td>
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<tr>
<td>*BIOL 122</td>
<td>General Biology 2 (BIOL 121 &amp; either CHEM 114 or CHEM 121)</td>
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<tr>
<td>*BIOL 286 or 386</td>
<td>General Microbiology Microbiology and Immunology (CHEM 122) (BIOL 322)</td>
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<tr>
<td>*BIOL 321</td>
<td>Human Physiology and Anatomy 1 (BIOL 122 &amp; CHEM 122)</td>
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<tr>
<td>*BIOL 322</td>
<td>Human Physiology and Anatomy 2 (BIOL 321)</td>
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<tr>
<td>BIOL 346 or 347 or 442</td>
<td>Ecological Assessment Environmental Conservation Ecology (BIOL 122) (BIOL 122) (BIOL 122)</td>
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<tr>
<td>*BIOL 375</td>
<td>Principles of Genetics (BIOL 122)</td>
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<tr>
<td>BIOL 460</td>
<td>Current Topics in Biology (ENGL 311, 321 or 323 &amp; Sr. Standing)</td>
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<tr>
<td>BIOL Electives (300 level or above) for a total of 36 credits in BIOL courses (see next page).</td>
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<td>7-9</td>
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<tr>
<td>BIOL 373 or 474</td>
<td>Cell Biology Advanced Cell-Molecular Biol (Recommended) (BIOL 122 &amp; CHEM 322) (BIOL 375 &amp; CHEM 364)</td>
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### Supporting Sciences – 34-37 Credit Hours Required

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<tr>
<th>SUPPORTING SCIENCES</th>
<th>34-37 Credit Hours Required</th>
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<tbody>
<tr>
<td>*MATH 135 or 220</td>
<td>Calculus for the Life Sciences Analytical Geometry &amp; Calculus 1 (MATH 130 or by placement)</td>
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<tr>
<td>*CHEM 121</td>
<td>General Chemistry 1 (MATH 115 and Prior Chemistry Class)</td>
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<td>*CHEM 122</td>
<td>General Chemistry 2 (CHEM 121)</td>
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<td>*CHEM 321</td>
<td>Organic Chemistry 1 (CHEM 122)</td>
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<tr>
<td>*CHEM 322</td>
<td>Organic Chemistry 2 (CHEM 321)</td>
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<tr>
<td>*CHEM 324 or 364</td>
<td>Fundamentals of Biochemistry Biochemistry (CHEM 322) (CHEM 322)</td>
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<td>*PHYS 211</td>
<td>Introductory Physics 1 (MATH 120)</td>
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<tr>
<td>PHYS 212</td>
<td>Introductory Physics 2 (PHYS 211)</td>
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BIOLOGY APPLICATION AREA - 5 Credit Hours Required (In addition to the course listed below, choose at least one more course from the list on the next page for a total of 5 credits. Additional credits in BIOL courses may also be used.)

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<thead>
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<th>Course</th>
<th>Credit</th>
<th>Grade</th>
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<tr>
<td>*MATH 251</td>
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<td>Statistics for the Life Sciences</td>
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<tr>
<td>(MATH 130)</td>
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ELECTIVES - 13-16 Credit Hours of courses to reach the minimum of 121 credits required for this degree.

GENERAL EDUCATION REQUIREMENTS

Courses which qualify in the Scientific Understanding (S), Cultural Enrichment (C) and Social Awareness (S) categories are delineated in the General Education section of the FSU electronic catalog: [http://www.ferris.edu/htmls/academics/gened/courses.html](http://www.ferris.edu/htmls/academics/gened/courses.html)

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<th>A. COMMUNICATION COMPETENCE</th>
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<td>Course</td>
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<td>ENGL 311 or 321 or 323</td>
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<tr>
<td>*COMM 121 program requirement</td>
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TOTAL

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<th>B. SCIENTIFIC UNDERSTANDING</th>
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<tr>
<th>C. QUANTITATIVE SKILLS</th>
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<td>This requirement is achieved in the program major.</td>
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<table>
<thead>
<tr>
<th>D. CULTURAL ENRICHMENT</th>
<th>9 Sem Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only approved “C” courses may count toward this category. Requirements: 1) one course must be 200+ level; 2) maximum 5 credit hours of music and/or theater activities may apply</td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Credit</td>
</tr>
<tr>
<td>*200+ level</td>
<td></td>
</tr>
<tr>
<td>*</td>
<td></td>
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</tbody>
</table>

TOTAL

<table>
<thead>
<tr>
<th>E. SOCIAL AWARENESS</th>
<th>9 Sem Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only approved “S” courses may count toward this category. Requirements: 1) two different subject areas including at least one “foundation” course, 2) one course must be 200+ level</td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Credit</td>
</tr>
<tr>
<td>*Foundation</td>
<td></td>
</tr>
<tr>
<td>PSYC 150 or SOCY 121</td>
<td></td>
</tr>
<tr>
<td>*ECON 221</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL

<table>
<thead>
<tr>
<th>F. GLOBAL CONSCIOUSNESS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Each student must complete one course from the list of qualifying courses presented in the FSU catalog. This course may also count toward fulfilling the Cultural Enrichment or Social Awareness requirement.</td>
<td></td>
</tr>
<tr>
<td>Course: *</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G. RACE/ETHNICITY/GENDER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Each student must complete one course from the list of qualifying courses presented in the FSU catalog. This course may also count toward fulfilling the Cultural Enrichment or Social Awareness requirement.</td>
<td></td>
</tr>
<tr>
<td>Course: *</td>
<td></td>
</tr>
</tbody>
</table>

Note: To complete this program in four years, students must average 15-16 credit hours per semester. Students MUST consult their faculty advisor to develop a course sequence plan appropriate to their academic development and educational plans.

**Biology Electives (Consult with Advisor):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 300 Pathophysiology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 301 Exercise Physiology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 330 Zoology</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BIOL 340 Evolution</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 343 Ornithology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 344 Entomology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 345 Environmental Regulations</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 348 Animal Behavior</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 349 Medical Parasitology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 350 Plants and Fungi</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BIOL 370 Developmental Biology</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BIOL 373 Cell Biology</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BIOL 407 Forensic DNA Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 421 Endocrinology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 453 Plant Physiology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 470 Molecular Genetics</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 472 Proteins</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 474 Adv. Cell/Mol. Biology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 475 Bioinformatics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIOL 485 Biological Research</td>
<td>1-9</td>
<td></td>
</tr>
<tr>
<td>BIOL 490 Special Topics in Biology</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>BIOL 492 Biology Internship</td>
<td>1-9</td>
<td></td>
</tr>
<tr>
<td>BIOL 497 Independent Study</td>
<td>1-6</td>
<td></td>
</tr>
</tbody>
</table>

**Application Area (Consult with advisor):** Any of the Biology electives above may be used. Other common classes taken include

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAHS 160 Nutrition for Healthy Living</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>EDPE 338 Biomechanics</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMLS 122 Responding to Emergencies</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>MRIS 102 Orientation to Med Vocab</td>
<td>1 or 4</td>
<td></td>
</tr>
<tr>
<td>MRIS 103 Medical Terminology</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Note: The Pharmacy Admission Test (PCAT) is required for admission to the College of Pharmacy. Students should consider taking the PCAT in the summer of the year prior to the year of entry. More information can be found at [www.pcatwebinfo](http://www.pcatwebinfo).

**NOTICE REGARDING WITHDRAWAL, RE-ADMISSION AND INTERRUPTION OF STUDIES**

Students who return to the university after an interrupted enrollment (not including summer semester) must normally meet the requirements of the curriculum which are in effect at the time of their return, not the requirements which were in effect when they were originally admitted.
Support with concerns. I still feel that it is in the best interests of everyone to have a combined degree. There must be some compromise that says this is the best of the two degrees that will give the student the best preparation for pharmacy, and the best degree for further work if they do not get into pharmacy. I think the CC should at least try to do this. Otherwise, I believe, it is very confusing to the student.

Jim Hoeter
Professor of Biological Sciences
Department of Biological Sciences
ASC 2005
Ferris State University
Big Rapids, MI 49307
231-591-2563 (voice)
231-591-2540 (fax)
hoeterj@ferris.edu
http://www.ferris.edu/hoeter

-----Mary E Zimmer/FSU wrote: -----
To: Connie L Boogaard/FSU@FERRIS, Daisy L Daubert/FSU@FERRIS, Olukemi Fadayomi/FSU@FERRIS, Clifton V Franklund/FSU@FERRIS, Robert E Friar/FSU@FERRIS, Scott Herron/FSU@FERRIS, James_Hoeter@ferris.edu, Bradley Isler/FSU@FERRIS, Paul Klatt/FSU@FERRIS, Roger Mitchell/FSU@FERRIS, Mary R Murnik/FSU@FERRIS, Gary L Rodabaugh/FSU@FERRIS, Michael Ryan/FSU@FERRIS, dwelldog@gmail.com, John F Vanderploeg/FSU@FERRIS, Christopher M Westerkamp/FSU@FERRIS, Changqi Zhu/FSU@FERRIS, Mary E Zimmer/FSU@FERRIS, Anne Spain/FSU@FERRIS
From: Mary E Zimmer/FSU
Date: 11/01/2011 11:43AM
Subject: Fw: Pre-Pharmacy Proposal

Here is another proposal that we discussed in our departmental meetings - the addition of Pre-pharmacy as a new concentration in Biology. Keep in mind that Chemistry will also be offering the students the option of getting a chemistry degree with a pre-pharmacy concentration (or something along these lines).

This was approved by the curriculum committee
5 - votes of support

Please send me your vote: support, support with concerns or no support. Please write out any concerns that you might have. If I could get you to vote by next Tuesday I would appreciate it.

Thank you,

Beth

M. Beth Zimmer
Response to Languages and Literature's concerns:

The Biology department realizes that ENGL 325 (Adv Business Writing) is an elective that fulfills the requirements for General Education. However, in the past, in every other Biology concentration, we only have ENG 321, ENGL 311, and ENGL 323 as possible electives. If a student came to us with ENGL 325 this would be accepted with a course substitution. We would prefer our students have the ENGL 321 as you mentioned and advisors encourage students to take this elective. Most of our students do take ENGL 321.