May 20, 2008

MEMORANDUM

TO: Stephen Halperin
Dean, College of Computer, Mathematical and Physical Sciences

FROM: Phyllis Peres
Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to establish a Minor in Geophysics (PCC log no. 07071)

At its meeting on May 16, the Senate Committee on Programs, Curricula and Courses approved your proposal to establish a Minor in Geophysics. A copy of the approved proposal is attached.

The changes are effective Fall, 2008. The College should ensure that the changes are fully described in the Undergraduate Catalog and in all relevant descriptive materials, and that all advisors are informed.

CWR/

Enclosure

cc: Carmen Balthrop, Chair, Senate PCC Committee
Sarah Bauder, Office of Student Financial Aid
Reka Montfort, University Senate
Barbara Hope, Data Administration
Denise Nadasen, Institutional Research & Planning
Anne Turkos, Archives
Linda Yokoi, Office of the Registrar
Scott Wolpert, Undergraduate Studies
David Lay, College of Computer, Mathematical and Physical Sciences
John Merck, Department of Geology
DATE SUBMITTED: 3/8/2008

COLLEGE/SCHOOL: CMPS

DEPARTMENT/PROGRAM: GEOL

PROPOSED ACTION (A separate form for each) ADD _X___ DELETE _____

CHANGE _____

DESCRIPTION (Provide a succinct account of the proposed action. Details should be provided in an attachment. Provide old and new sample programs for curriculum changes.)

This is a proposal to add a Minor in Geophysics. See attached.

JUSTIFICATION/REASONS/RESOURCES (Briefly explain the reason for the proposed action. Identify the source of new resources that may be required. Details should be provided in an attachment.)

To reflect the growing prominence of geophysics in the Department of Geology's research effort, and increased presence of geophysicists among its faculty and to provide access to and provide non-Geology majors with meaningful access to faculty engaged in all of its aspects. See attached.

APPROVAL SIGNATURES

1. Department Committee Chair

2. Department Chair

3. College/School PCC Chair

4. Dean/Dean

5. Dean of the Graduate School (if required)

6. Chair, Senate PCC

7. Chair of Senate

8. Vice President for Academic Affairs & Provost

VPAA Rev. 3/1/04
Proposal for a new Minor in Geophysics

1. Why the minor is needed:

Geophysics is a major branch of the physical sciences that has until now been neglected by the University of Maryland. Geophysicists make important contributions in many areas, including: mining and exploration of natural resources; national defense and test ban verification; natural hazard mitigation; environmental consulting and regulation; Earth-space interaction; education and research; and others. The principal professional society for geophysicists, the American Geophysical Union (AGU), is slightly larger than the American Physical Society. Three of the University of Maryland’s peer institutions (Berkeley, UCLA, and, UNC - Chapel Hill) offer geophysics majors distinct from their geology majors. In the last few years the Geology department, recognizing the prominence of this field, began to strengthen its faculty in geophysics to better serve the students of Maryland to prepare them for geophysics-related careers. Since 2005, we have hired four new tenure-track geophysics faculty with significant research interests in geophysics have joined our faculty. Additionally, cross-disciplinary collaborations have strengthened our geophysics effort, with Dr. Daniel Lathrop, Professor of Physics, receiving a 10% appointment to the Geology faculty and several Geology faculty joining the faculty of the Applied Mathematics and Scientific Computation program. Undergraduate geology majors have responded enthusiastically, and our introductory course in geophysics, GEOL446, was filled last semester. However, geophysics is a highly interdisciplinary field; AGU includes very many members who were trained in physics, mathematics, computer science, engineering, and astronomy. Accordingly, we expect that many or most of the future geophysicists studying at Maryland are majoring not in geology but in one of these related fields. We propose a minor in Geophysics to meet the interests of these students.

2. Objectives of the minor:

As stated above, the objective of the minor is to help prepare students for geophysics-related careers by giving them a sophisticated understanding of the application of the methods of physics to central issues of geoscience. The highly interdisciplinary nature of the field is such that many future geophysicists should be studying in some major other than geology. A geophysics minor will reward them and encourage them for their interest in the Earth sciences, while permitting them to pursue a major in physics, engineering, or other related science, to obtain the appropriate technical skills that are not necessarily offered in the regular Geology curriculum. Building on a three-course base of fundamental knowledge of geology and fundamental methods of geophysics, the program is completed by two advanced courses addressing specific topics in the dynamics of the physical Earth. Students attempting this minor will need a strong background in physics at the level of PHYS141 and calculus at the level of MATH141. Depending on the advanced courses chosen, CHEM131/132, or GEOL102 (Historical Geology) may also be prerequisites.

3. Courses required for the proposed minor:

Required:
• One of the following:
  - GEOL 100/110 Physical Geology/Physical Geology (4)
  - GEOL 120/110 Environmental Geology/Physical Geology Lab (4)
• GEOL446 Introduction to Geophysics (3)
• GEOL457 Seismology (3)

In addition, the student must choose two from the following:

• GEOL322 Mineralogy (4)
• GEOL341 Structural Geology (4)
• GEOL472 Tectonics (3)
• GEOL455 Marine Geophysics (3)
• GEOL499 Special Problems in Geology (3 cr. Letter grade only)

Depending on the optional course taken, there is a total of 16 - 18 required credits (see prerequisites). All courses presented for the minor must be passed with a grade of C or better.

Declared Geology majors and students who have completed the geology major may not also minor in Geophysics.

4. Oversight and Record Keeping

Oversight of this minor program will be through the normal academic processes of the Department of Geology. The department's Undergraduate Director will be responsible for ensuring that students are properly advised and that records are appropriately kept.

5. Prerequisites

PHYS141, MATH140, and MATH141 are not included as a specific minor requirement because they are prerequisites for required courses in this minor. GEOL102 is omitted because, although a prerequisite for an optional course (GEOL341), it is not a prerequisite for any required course of the minor. Specific prerequisites for upper level courses are:

• GEOL322 Mineralogy: GEOL100 or GEOL120, GEOL110, CHEM131 and CHEM132 or CHEM135 and CHEM136
• GEOL 341 Structural Geology: GEOL100 or GEOL120, GEOL110, GEOL102
• GEOL446 Introduction to Geophysics: MATH140, MATH141, PHYS141
• GEOL455 Marine Geophysics: GEOL100 or GEOL120, MATH140, MATH141, or permission of department
• GEOL457 Seismology: GEOL100 or GEOL120, GEOL110, MATH140, MATH141
• GEOL472 Tectonics: MATH140, MATH141, and GEOL100 or GEOL120

6. Anticipated enrollment:

On the basis of enrollment of non-majors in GEOL446, and conversations with
interested students, we estimate approximately 6 students are likely to be geophysics
minors on an ongoing basis, if this option were available to undergraduates. For
comparison, the Geology department normally has roughly 35 undergraduate majors at
any one time, plus 7 students currently declared in all of the minors we currently offer.
Department of Geology

Advising Worksheet - Minor in:

GEOPHYSICS

Name of Student: ________________________________________________________________

University ID Number: ___________________________ Major: ____________________________

Telephone: ___________________________ e-mail address: ________________________________

Estimated date of graduation: ______________________________________________________

Courses completed toward Minor:

<table>
<thead>
<tr>
<th>Required</th>
<th>Date</th>
<th>Grade</th>
<th>Credits</th>
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<tbody>
<tr>
<td>One of the following:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>o GEOL 100/110 Physical Geology/ Lab</td>
<td></td>
<td></td>
<td>(4)</td>
</tr>
<tr>
<td>o GEOL 120/110 Environmental Geology/ Lab</td>
<td></td>
<td></td>
<td>(4)</td>
</tr>
<tr>
<td>GEOL 446 Introduction to Geophysics</td>
<td></td>
<td></td>
<td>(3)</td>
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<tr>
<td>GEOL 457 Seismology</td>
<td></td>
<td></td>
<td>(3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plus two from:</th>
<th>Date</th>
<th>Grade</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 322 Mineralogy</td>
<td></td>
<td></td>
<td>(4)</td>
</tr>
<tr>
<td>GEOL 341 Structural Geology</td>
<td></td>
<td></td>
<td>(4)</td>
</tr>
<tr>
<td>GEOL 472 Tectonics</td>
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<td></td>
<td>(3)</td>
</tr>
<tr>
<td>GEOL 455 Marine Geophysics</td>
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<td></td>
<td>(3)</td>
</tr>
<tr>
<td>GEOL 499 Special Problems in Geology</td>
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<td>(3)</td>
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</tbody>
</table>

The student has completed the requirements for a Minor in Geophysics

(Signature of Minor Advisor)  (Date)

Minor requirements effective September 2008