MEMORANDUM

TO: Jayanth Banavar
   Dean, College of Computer, Mathematical and Natural Sciences

FROM: Elizabeth Beise
   Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Curriculum of the Bachelor of Science in Geology-
   Professional Track (PCC log no. 12015)

At its meeting on October 5, 2012, the Senate Committee on Programs, Curricula, and
Courses approved your proposal to modify the curriculum of the Bachelor of Science in
Geology-Professional Track. A copy of the approved proposal is attached.

The change is effective Spring 2013. Please ensure that the change is fully described in
the Undergraduate Catalog and in all relevant descriptive materials, including the program’s
four-year plan (contact Lisa Kiely at lkiely@umd.edu for more information), and that all
advisors are informed.

MDC/

Enclosure

cc: William Idsardi, Chair, Senate PCC Committee
    Sarah Bauder, Office of Student Financial Aid
    Reka Montfort, University Senate
    Erin Howard, Division of Information Technology
    Donna Williams, Institutional Research, Planning & Assessment
    Anne Turkos, University Archives
    Linda Yokoi, Office of the Registrar
    Robert Gaines, Undergraduate Studies
    Robert Infantino, College of Computer, Mathematical and Natural Sciences
    Roberta Rudnick, Department of Geology
This is a proposal for an alteration of the geology course requirements for the major in Geology, Professional Track. See attached.

This proposal involves two changes:
• The Geology Professional Track major currently requires GEOL446 - Geophysics. Geology proposes that this requirement be changed, to enable students to chose between GEOL446 and the new GEOL447 - Observational Geophysics
• The Geology Professional Track major currently requires a 300-400 level geology elective. This proposal modifies the language of this requirement in response to the change proposed above.
This change requires no additional resources. See attached.

APPROVAL SIGNATURES

1. Department Committee Chair
2. Department Chair
3. College/School PCC Chair
4. Dean
5. Dean of the Graduate School (if required)
6. Chair, Senate PCC
7. Chair of Senate
8. Vice President for Academic Affairs & Provost

DATE
9/12/12
9/12/12
9/26/2012
9/26/12
10/5/2012
10/5/2012
10/8/2012

VPAAP Rev. 3/1/04
Geology Major, Professional Track

1. This is a proposal to alter requirements for an existing major.

2. The Catalog Description is unchanged. The proposed program follows. Change is in boldface.

Courses currently required for the major are:

• Geology Courses
  One of the following:
  - GEOL 100/110—Physical Geology and Laboratory
  - GEOL 120/110—Environmental Geology and Lab
  GEOL 102—Historical Geology
  GEOL 322—Mineralogy
  GEOL 340—Geomorphology
  GEOL 341—Structural Geology
  GEOL 342—Stratigraphy and Sedimentation
  GEOL 393—Technical Writing
  GEOL 394—Research Problems
  One of the following:
    - GEOL 444—Low-Temperature Geochemistry
    - GEOL 445—High-Temperature Geochemistry
  GEOL 446—Geophysics
  GEOL 451—Groundwater
  GEOL 423—Optical Mineralogy
  GEOL 443—Petrology
  GEOL 490—Field Camp

• Supporting Courses
  One of the following
  - CHEM 131—Fundamentals of General Chemistry and CHEM 132—Fundamentals of General Chemistry Laboratory (4)
  - CHEM 135—Chemistry for Engineers and CHEM 136—Chemistry for Engineers Laboratory (4)
  MATH 140—Calculus I
  MATH 141—Calculus II
  One of the following
    - PHYS 141—Principles of Physics
    - PHYS 161—General Physics: Mechanics and Particle Dynamics and
      PHYS 174—Physics Laboratory Introduction
    - PHYS 171—Introductory Physics: Mechanics and Relativity and
      PHYS 174—Physics Laboratory Introduction
  One of the following
    - PHYS 142—Principles of Physics
    - PHYS 260 General Physics: Vibration, Waves, Heat, Electricity and Magnetism and PHYS 261 General Physics: Vibrations, Waves, Heat,
Courses to be required for the major under the proposed revision are:

• Geology Courses
  One of the following:
  - GEOL 100/110—Physical Geology and Laboratory
  - GEOL 120/110—Environmental Geology and Lab
  GEOL 102—Historical Geology
  GEOL 322—Mineralogy
  GEOL 340—Geomorphology
  GEOL 341—Structural Geology
  GEOL 342—Stratigraphy and Sedimentation
  GEOL 393—Technical Writing
  GEOL 394—Research Problems
  One of the following:
  - GEOL 444—Low-Temperature Geochemistry
  - GEOL 445—High-Temperature Geochemistry
  **One of the following:**
  - GEOL 446—Geophysics
  - GEOL 447—Observational Geophysics
  GEOL 451—Groundwater
  GEOL 423—Optical Mineralogy
  GEOL 443—Petrology
  GEOL 490—Field Camp

• Supporting Courses
  One of the following
  - CHEM 131—Fundamentals of General Chemistry and CHEM 132—Fundamentals of General Chemistry Laboratory (4)
  - CHEM 135—Chemistry for Engineers and CHEM 136—Chemistry for Engineers Laboratory (4)
  MATH 140—Calculus I
  MATH 141—Calculus II
  One of the following
  - PHYS 141—Principles of Physics
  - PHYS 161—General Physics: Mechanics and Particle Dynamics and PHYS 174—Physics Laboratory Introduction
  - PHYS 171—Introductory Physics: Mechanics and Relativity and PHYS 174—Physics Laboratory Introduction
  One of the following
PHYS 142—Principles of Physics
PHYS 260 General Physics: Vibration, Waves, Heat, Electricity and Magnetism and PHYS 261 General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (Laboratory)
PHYS 272 Introductory Physics: Fields
BIOM 301—Introduction to Biometrics
Any of GEOL444, 445, 446 or 447 not already completed to meet the requirements above or any other 3-4 credit 300 or 400 level Geology course not listed above.

The proposed change in addresses two issues in the Geology program:

1) Geophysics option: Beginning in 2006 with the hiring of Saswata Hier-Majumder, Geology committed to developing a significant research community in geophysics, which is the study of Earth structure and processes using quantitative physical methods. By 2010, geophysics was the primary research interest and activity of five faculty members in Geology. Geophysics also became an important component of our undergraduate teaching effort. GEOL446 - Geophysics, has been a professional-track major requirement since 2008, while three other courses related to geophysics are offered as upper-level electives. This effort has been significantly advanced by the 2011 hiring of Dr. Vedran Lekic, whose expertise enables us to offer an upper level course in observational geophysics, focusing on the quantitative analysis and modeling of geophysical data. Because this course's content is valuable both as academic and professional preparation for students seeking careers in geophysics, we regard it as perverse that it should not, routinely, be allowed to substitute for the more theory-oriented GEOL446. Moreover, in the longer term, Geology contemplates a Geophysics major track in accordance with our current five-year plan. We expect Observational Geophysics to play a key role in this curriculum.

The permanent number for Observational Geophysics, GEOL447, was approved in May of 2012. It is currently being piloted as GEOL489O.

2) The Geology Elective: The establishment of GEOL446 or GEOL447 as options for the satisfaction of a major requirement in geophysics necessitates a revision to the language of Geology's elective requirement. This is to clarify that any student taking both courses would be able to count one as satisfying the elective requirement. The proposed language is modeled on that used for the similar geochemistry options (GEOL444 and GEOL445.)

Additionally, this change corrects a long-standing inaccuracy of the elective requirement language. Before fall of 2008, students were offered a choice between GEOL446 - Geophysics and GEOL472 - Tectonics. This choice was eliminated in 2008, when GEOL446 became mandatory and GEOL472 came strictly to be treated as an elective course. Unfortunately, a reference to GEOL472 was mistakenly retained in the elective language. That is eliminated by the current proposal.