

**The University of Michigan  
College of Engineering  
Curriculum Committee**

**Agenda**

**January 08, 2013**

**1:30-3:00 p.m.**

**Room 265 Chrysler Center**

1. Approval of 2 new ChE Concentrations
2. Course Approval Forms

*Susan Montgomery*

Date: January 3, 2013

From: Susan Montgomery, Chemical Engineering UG Program Committee Chair

To: College of Engineering Curriculum Committee

Re: Approval of Concentration in BioPharmaceutical Engineering and  
Concentration in Petroleum and Gas Exploration

We seek approval of the following two concentrations, that will help our students personalize their curriculum to their individual career goals.

Concentration in BioPharmaceutical Engineering  
Concentration in Petroleum and Gas Exploration

These concentrations fulfill the requirements for COE concentrations and will add to the breadth of concentrations currently available to our students:

Concentration in Electrical Engineering  
Concentration in Energy Systems Engineering  
Concentration in Environmental Engineering  
Concentration in the Life Science  
Concentration in Materials Science and Engineering  
Concentration in Mechanical Engineering  
Concentration in Nuclear Engineering

The Concentration in BioPharmaceutical Engineering was proposed by Prof. Henry Wang and colleagues to focus specifically in the pharmaceutical industry in a way that the current broad Concentration in Life Science does not address.

The Concentration in Petroleum and Gas Exploration was developed by the Undergraduate Committee based on student interest and in consultation with representatives of the Earth Division and the Civil and Environmental Engineering department, all of whom were very enthusiastic about it. Input from alumni in the field was also incorporated.

Thank you for your consideration.

**Proposed new Concentration in Biopharmaceutical Engineering  
Chemical Engineering at The University of Michigan  
(approved by UGPC 11/30/12, ChE dept 12/3/12)**

**Biopharmaceutical Engineering Concentration (total 12 credit hours)**

**Concentration courses (select at least 2 courses from the following list)**

ChE/Pharm 519	Modern Pharmaceutical Engineering	(3)	W
ChE/Pharm 597	Regulatory Science for Scientists and Engineers	(2)	F
ChE 574	Engineering Principles in Drug Delivery and Targeting	(3)	W
Pharm Sci 464	Pharmacokinetics	(4)	F
or			
Pharmacol 601	Quantitative Pharmacology	(3)	W

**Other relevant electives in this Concentration**

Stat 570	Design of Experiments	(3)	W
IOE 461	Quality Engineering	(3)	F
Pysch 449	Decision Processes	(3)	F
LHC 319	Intellectual Property Law	(2.25)	W
EHS 508	Principles of Risk Assessment	(2)	W
BME/ChE 598	Quality Systems and Regulatory Innovation (new)	(2)	W
Biochem 415/515	Introductory Biochemistry Chem 351 or MCDB 310 are acceptable substitutes	(3)	F
ChE 517	Biochemical Engineering	(3)	W
EPID 545	Molecular Techniques Lab	(3)	W
BME 410	Design and Applications of Biomaterials	(3)	F
Pharmacol 503	Drug Discovery and Development	(2)	W
Pharmacol 621	Translational Pharmacology	(2)	W

**Proposed new Concentration in Petroleum and Gas Exploration  
(approved by UGPC 11/30, by ChE dept 12/3/12 )**

Technical electives – 12 credits, to include 4 lecture courses, composed of at least 3 credits of 300 level or higher EARTH courses and 3 credits of 300 level or higher CEE courses. Only one of EARTH 116 OR EARTH 119 can count toward the concentration.

EARTH 116 / ENVIRON 116. Introductory Geology in the Field - 5 credits

EARTH 118 - Introductory Geology Laboratory - 1 credit

EARTH 119 - Introductory Geology Lectures – 4 credits

EARTH 284 - Environmental Geology – 4 credits

EARTH 305 - Earth's Surface and Sediments – 4 credits (requires introductory geology course)

EARTH 310 - Geochemistry of the Solid Earth – 4 cr. (requires introductory geology course)

EARTH 314 - Global and Applied Geophysics

EARTH 351 - Earth Structure

EARTH 380 - Mineral Resources, Economics, and the Environment – 4 credits

EARTH 422 - Principles of Geochemistry – 4 cr. (requires introductory geology course)

EARTH 467 - Stratigraphy and Basin Analysis – 4 cr. (requires introductory geology course)

CEE 345. Geotechnical Engineering

CEE 428. (ENSCEN 428) Groundwater Hydrology

CEE 446. Engineering Geology & Site Characterization

CEE 522. Sediment Transport

CEE 527. Coastal Hydraulics

CEE 528. (ENSCEN 528) Flow and Transport in Porous Media

CEE 535. Excavation and Tunneling