

Frequently Asked Questions

Q: How do I sign up for a minor?

- Answer: There is a blue *Curriculum Add/Drop Form* you must fill out and have signed by the minor advisor. Changes are official for a semester when the form is submitted to the Registrar's Office by Wednesday of week 2.

Q: How do I drop a minor?

- Answer: The blue *Curriculum Add/Drop Form* is for dropping a minor. You do not need any approval signatures; just fill it out and take it to the Registrar's Office.

Q: Do credits from a minor double count towards my major?

- Answer: Yes, they may, but you must earn at least 6 credits at the 3000 – 4000 level that do not double count towards your major, except as free electives.

Q: Can I minor in more than one thing?

- Answer: Yes. The six credits not double counting (see above) must be unique for each minor.

Q: When are the courses offered?

- Answer: The course schedule is on the web: <http://www.mtu.edu/registrar/>
Note that many courses are on an alternate year schedule.

Michigan Tech

Michigan Technological University
Department of Chemical Engineering

Faculty Involved with the *Bioprocess Engineering Minor:*

- Dr. David Shonnard
drshonna@mtu.edu
- Dr. Ching-An Peng
cpeng@mtu.edu
- Dr. Adrienne Minerick
minerick@mtu.edu
- Dr. Caryn Heldt
heldt@mtu.edu
- Dr. Wen Zhou
wzhou1@mtu.edu

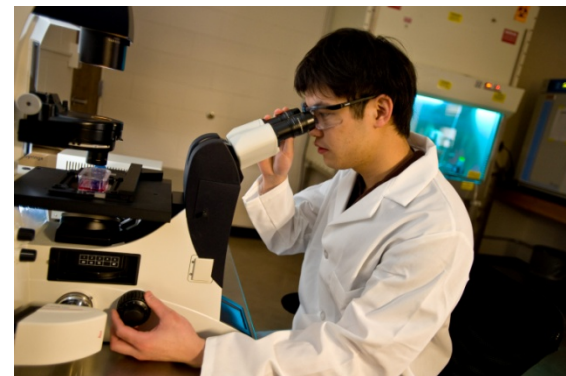
Chemical Engineering Advising
Email: *cmadvise@mtu.edu*
ChemSci 202M 906-487-4327

Advisors:

Ms. Katie Torrey
Dr. Faith Morrison

Department of Chemical Engineering
Michigan Technological University
1400 Townsend Drive
Houghton, MI 4993101295
906-487-3132

Minor in Bioprocess Engineering at Michigan Tech



This minor prepares students for careers in the field of bioprocess engineering, which includes pharmaceutical engineering and manufacturing, and agricultural engineering and processing. Biological processes are being increasingly utilized by major chemical, pharmaceutical, and food manufacturers, creating a strong demand for graduates with expertise in this area. The students who are interested in this program are those who want to work in bio-related organizations, including the largest chemical and pharmaceutical companies in the world, several of which are based in Michigan.

Required credits: 16cr
Required classes: See other side

Name (please print): _____
(Last) (First) (Middle)

Student Number: _____

Primary Major: _____ Expected Major Completion Term: _____

There are two tracks to the Bioprocess Engineering Minor, the Engineering Track and the Biological Track (located on the reverse of this page.) Please select one for completion.

Engineering Track

Required Courses (10 Credits)

- _____ BL 2100 Principles of Biochemistry (3) OR
CH 4710 Biomolecular Chemistry I (3)
- _____ CM 2120 Fund of Chem Engg 2 (3) OR
CM 2200 Intro to Minerals and Materials (3) OR
ENVE 3501 Env Engg Fundamentals (3) OR
ENVE 3503 Environmental Engineering (3)
- _____ CM 4125 Bioprocess Engineering Lab (1)
- _____ CM 4710 Biochemical Processes (3)

Credits Required = 16
Total Credits _____

Elective Courses (6 Credits)

- _____ BL 3210 General Microbiology (4) OR
BL 3310 Environmental Microbiology (3)
- _____ BL 4000 Research in Biology (1-3) *
- _____ BL 4010 Biochemistry I (3)
- _____ BL 4020 Biochemistry II (3)
- _____ BL 4220 Applied & Industrial Microbiology (3)
- _____ BL 4820 Biochemical Laboratory Techniques I (2)
- _____ CH 4110 Pharmaceutical Chem: Drug Action (3)
- _____ CH 4120 Pharmaceutical Chem: Drug Design (3)
- _____ CH 4720 Biomolecular Chemistry II (3)
- _____ CM 4040 UG Research in Bioengineering (1-3)
- _____ CM 4550 Industrial Chemical Production (3)
- _____ CM 4770 Analytical Microdevice Tech (3)
- _____ CM 4780 Biomanufacturing & Biosafety (3)
- _____ CM 4990 Special Topics in CM (1-3)*

*Topic must be approved.

Biological Track

Required Courses (14 Credits)

- _____ BL 2100 Principles of Biochemistry (3)
- _____ BL 3210 Microbiology (4)
- _____ BL 4220 Applied and Industrial Microbiology (3)
- _____ CM 2200 Intro to Minerals and Materials (3) OR
CM 4710 Biochemical Processes (3) OR
ENVE 3501 Env Engg Fundamentals (3) OR
ENVE 3503 Environmental Engineering (3)
- _____ CM 4125 Bioprocess Engineering Lab (1)

Elective Courses (2 Credits)

- _____ BL 4000 Undergrad Research in Biological Sciences (1-3)*
- _____ BL 4010 Biochem I (3)
- _____ BL 4020 Biochem II (3)
- _____ BL 4820 Biochem Lab I (2)
- _____ CM 2200 Intro to Minerals and Materials (3)
- _____ CM 4040 Undergrad Research in Bioengineering (1-3)
- _____ CM 4710 Biochemical Processes (3)
- _____ CM 4770 Analytical Microdevice Technologies (3)
- _____ CM 4780 Biomanufacturing & Biosafety
- _____ CM 4990 Special Topics in CM (1-3)*

* Topic must be approved.

Courses listed in this minor have the following prerequisites (shown in parenthesis). Concurrency is illustrated by the letter C: BL2100 ((BL1020 or BL1040 or BL2400 and CH1112 or (CH1150 and CH1151)), BL3210 ((BL1020 or BL1040) and (BL2100 or CH4710)), BL4010 ((BL1020 or BL1040 or BL2010) and BL2100 and (CH2410 and CH2420)), BL4020 (BL4010), BL4820 (BL4010 (C) or CH4710 (C)), CH4110 ((BL4010 or CH4710), CH4120 (CH2420), CH4710 (CH2420), CH4720 (BL4010 or CH4710), CM2120 (CM2110), CM4125 (CM4710 (C) or BL3210 or BL3310), CM4550 (CH2410 and CM3510 (C)), CM4710 (CM3110 (C))

Credits Required = 16
Total Credits _____

Student Signature _____

Date _____

Minor Advisor Signature _____

Date _____