ChemBE Class Meeting Spring 2022

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Director of Undergraduate Studies
Objectives

► How are you doing this semester?

► Timeline; Advising Meeting process update reminder!

► Overview of the curriculum
  ► Computing/programming
  ► Design
  ► Research credits
  ► Engineering/track credits

► Useful information for each class and deadlines

► Q&A
Timeline and Advising Meetings

► Course schedule available Mon Mar 28

► Advising week April 4 (Mon) – April 8 (Fri)
  ► Sign up for an appointment with your faculty advisor. They will contact you.
  ► Prepare your Fall ’22 Schedule and Checklist prior to the advising meeting
    ● If you know how to use Degree Audit planning tool, you can use that as a supplement to the Checklist.
  ► **New Process (reminder):** After your meeting, your advisor will leave a comment in Degree Audit to indicate that you have had the meeting. Please do NOT email the checklist to the UG Coordinator!
  ► Mr. Weinstein or your advisor will lift the hold on your SIS registration
ChemBE curriculum overview

Math (16)
- Calc 1 (4)
- Calc 2 (4)
- Calc 3 (4)
- Diff EQ or LADE (4)

Basic Sci (17)
- Chem 1+lab (4)
- Chem 2+lab (4)
- Phys 1+lab (5)
- Phys II (4)
- Adv. Sci (13)
  - Org. Chem I (4)
  - Biochem (3)
  - Chem/bio lab (1-3)
  - Cell bio or Adv. electives (3-5)

Foundation (5)
- ChemBE Sem. (1)
- Gateway (3)
- Safety (1)

Core (18)
- MEB (4)
- Thermo (3)
- Transport I (3)
- Transport II (4)
- Kinetics (4)

Applications (17)
- Separations (4)
- Product Design (3)
- Process Design [ASPEN] (2)
- Process Control (4)
- Senior lab (4)

Eng. Electives (8-9)
- Eng. Elective (3)
- Eng. Elective (3)
- Eng. Elective (3)
- Eng. Elective (3)
- Eng. Elective (3)
- Eng. Elective (3)
- Eng. Elective (3)

HS (18)
- Culture Eng. (3)
- 300 lvl Elective (3)
- W Elective (3)
- Elective (3)
- Elective (3)
- Elective (3)

Undesignated electives (16)
- Und. Elective (3)
- Und. Elective (3)
- Und. Elective (3)
- Und. Elective (3)
- Und. Elective (3)
- Und. Elective (2)
- Und. Elective (2)
- Und. Elective (2)
- Und. Elective (2)

Must have 48 total engineering credits

Must have 128 total credits – no exceptions!
Computing/programming and statistics

- Everyone takes Gateway Computing (Python) EN.540.113 from now on
  - We accept AP Credits from Computer Science A – but we strongly recommend you take 1-credit EN.500.113 Bootcamp (Python) if you are not familiar with the language
  - Juniors & Seniors, make sure you have one Programming course (Gateway, Mod&Stat, Java, Intermediate) to meet the computing requirement

- UG stat/comp electives (we strongly recommend you take at least one)
  - EN.540.382 Statistical Modeling and Analysis with Python (2 credits)
  - EN.540.405 Modern Data Analysis and Machine Learning for ChemBEs (3 credits)
**Design courses**

► **Every student** must complete
  ► EN.540.315 ChemBE Process Design (2 credits, spring)

► **Every student** must complete one of the following Product Design options:
  
  Option 1 – One Semester
  540.314 ChemBE Product Design (3 cr., spring)

  Option 2 – ChemBE 2 semesters
  540.309 ChemBE Product Design Part I (3 cr., fall and spring)
  540.310 ChemBE Product Design Part 2 (3 cr., fall and spring)

  Option 3 – Multidisciplinary Engineering Design, 2 semesters
  500.308 MultiD Engineering Design 1 (3 cr., fall)
  500.309 MultiD Engineering Design 2 (3 cr., spring)

**Notes**

If a student begins the year-long design sequence, they will not receive credit for the 1st part until the 2nd part is completed.

If you want more design:
FYS: Design Thinking & Innovation (3 cr., S22)
540.290/291 ChemBE Design (sophomores)
540.390/391 ChemBE Design (juniors)
Research credits

- You can get 6 credits of research per year; One credit = 40 total hours on project

- New since Spring 2022
  - Research in WSE – 4 credits can be counted towards engineering credits (just notify DUS/UG Coord.)
    - If you work in a ChemBE lab, sign up for 540.511 (fall and spring)
    - If you work in another WSE lab, sign up under that department’s research number (5xx.5xx.)

- Research outside of the engineering school
  - Sign up for 540.501 through your advisor (fall and spring)
  - To count these research credits as engineering electives, fill out the Research Credit Elective Request form after the semester has been completed; you will have to submit rationale as to why this counts as engineering research

- To apply ANY research credits as MCB/IN track credits, fill out the Research Credit Elective Request form after the semester has been completed
Engineering electives

- Any course with an “E” designation in WSE
  - EXCEPT courses with repeat of content (ex. Thermodynamics, fluid mechanics)
  - NO probability, statistics, prob/stat classes from AMS department (these are math credits!)
  - CLE courses are not often E or H or S

- See (non-exhaustive) list of approved engineering electives in UG Advising Manual (pg. 20-22)
  - Bioengineering and nano electives are engineering electives!
  - Not all new courses are reflected in UG Manual – check Course Catalogue/SIS for latest info and offering times
ChemBE Electives Fall 2022

EN.540.382 – Statistical Modeling and Analysis with Python
EN.540.407/607 – Renewable Energy Technologies
EN.540.415/615 – Interfacial Science with Applications to Nanoscale Systems
EN.540.418 – Projects in the Design of a Chemical Car (only if you plan to be in 419 in S23!)
EN.540.421 – Project in Design: Pharmacodynamics (need approval)
EN.540.440/640 – Micro/Nanotechnology
EN.540.465/665 – Engineering Principles of Drug Delivery
EN.540.468 – Introduction to Nonlinear Dynamics and Chaos
Track requirements

**Interfaces and Nanotechnology**
- 030.305 Physical Chemistry Instrumentation Lab (spring)
- 030.452 Materials & Surface Characterization (fall)
- 6 approved IN-track elective credits

**Cellular and Molecular Bioengineering (MCB)**
- 020.315 Biochem Lab (1 cr.) or 250.253 PEBL (3 cr.)
- 020.306 Cell Bio (spring) or 540.307 Cell Bio for Engineers (spring)
- 6 approved MCB-track elective credits

*You need DUS approval (not your advisor) if the course is not currently approved for tracks – provide the full syllabus of the course when submitting your request through email.*
Rising Sophomore Fall

Registration starts April 15 (Fri)

• 110.302 Differential Equations (pre-req for Transport 1)
  • or 553.291 LADE
• 030.205 Organic Chem 1 (fall only!)
• 540.202 Intro to Process Analysis
• 540.303 Transport I (if you already completed Diff Eq/LADE)
• H/S Course
• If you have completed 540.202 and Calc 3, then you can take Thermo (540.203)

Planning your summer – courses at JHU or other university (approval required)
Research – ask now!
Internship – Keep an eye out for ChemBE_CEO announcements, LDL, and Handshake
Interested in study abroad or co-op? Junior Fall is a good time!

Looking ahead to Sophomore
Spring
Finishing ChemBE lower-level courses
Rising Junior Fall

Registration starts April 13 (Wed)

- 540.304 Transport II (Fall only!)
- 540.490 Process Safety (Fall only!)
- Adv. science lab (Biochem lab, PEBL, or Orgo lab)
- 661.315 Culture of Engineering Profession (W) (fall/spring)
- Electives (H/S, engineering, undesignated)

Plan your summer – research, internship, REUs
Keep an eye out for ChemBE_CEO announcements, LDL, and Handshake

Looking ahead to Junior Spring
Kinetics, separations, cell bio or adv. chem/bio
Rising Senior Fall

Registration starts Apr 11 (Mon)

- 540.311/313 Senior lab (Fall only!)
- 540.409 Dynamic Modeling & Control (Fall only!)
- 540.309 or 500.308 (if you want year-long Design)
- H/S – you need 18 (6 3-cr classes), make sure you’ve taken one 300 level, and two W
- Engineering electives – you need 8-9 E credits, count them up!
- You need 128 credits to graduate – count them up!

Talk to your faculty advisor/DUS/APC before making changes

Tracks don’t show on diploma; you don’t need to apply for honors either
Exciting times ahead for our rising seniors!

- Keep your credit load reasonable to allow time for post-graduation preparations!
- Watch for rules on retaking a course: a *retake erases the previous grade*.
- You should be working on job search, grad/med school applications right now!
  - GRE? MCAT?
  - If you are going to grad school, consider 600 level courses (adv math, more computing, etc.)
- Don’t wait too long to ask for letters of recommendations
  - Ideally, give the professors at least one month of notice
  - When emailing the profs, give them the deadline, how the letters will need to be submitted, how many places will they need to submit it, AS MUCH INFO AS YOU CAN GIVE
  - Kindly remind the profs a week before the deadline
ChemBE news

Some new faces:

Dr. Brandon Bukowski  Dr. Yayuan Liu  Dr. Nagma Zerin

Other news:
Dr. Marc Donohue is retiring!
BS/MS: overview

Two options: Research (thesis) and Course-based

**Research:** 6 courses (4 ChemBEs) and research
- Work in a ChemBE lab under the supervision of an advisor.
- We can help you find an advisor.

**Course-based:** 10 courses (6 ChemBEs)

- Both programs: 2 courses can count toward both B.S. and M.S.E. but they need to be at the 600-level (very few exceptions)
- Additional 600-level courses may only count towards one degree.
- GPA: generally a minimum of 3.0 (few exceptions)
- NO GRE required and only one recommendation letter (Advisor)
- You can start research early
- Students from the program tend to place well: Intel, Accenture, Nasa, Genentech, Biotech industry, Med School, Grad School.

Questions?
Please see Dr. Ratanalert
COUNT YOUR CREDITS

- 128 total
- 48 engineering
- 13 advanced chemistry/biology
- 16 math
- 6 HS courses (at least 3 credits each)
CHEMBE COURSE
REGISTRATION ADVISING

- General Registration and Coursework Q&A
- 1-on-1 Scheduling Advice
- Course recommendations from upperclassmen

MARCH 30, 1:30–2:30PM. MARYLAND HALL 220
DUS/APC help hours

Director of Undergraduate Studies
Dr. Lilian Lam Josephson
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UG Academic Program Coordinator
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Virtual, walk-in DUS hours: W 10-11 am, F 10:30 am -12 pm at https://wse.zoom.us/my/lljosephson

Qs about UG curriculum? First check the ChemBE Undergraduate Advising Manual (Updated July 2021)
Open Q&A