

COLLEGE OF CHEMISTRY COURSE GUIDE (../INDEX.HTML)

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LIST OF COURSES (COURSES.HTML)

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BIOE 148 (BIOE 248) - BIOENERGY AND SUSTAINABLE CHEMICAL SYNTHESIS: METABOLIC ENGINEERING AND SYNTHETIC BIOLOGY APPROACHES (3 UNITS)

COURSE OVERVIEW

SUMMARY

Bioengineering 148/248 is a bioengineering elective which consists of roughly half undergraduate and half graduate students. The course focuses on synthetic biology and its current applications in industry and consists of industry speakers, lectures, and design challenges. There are about seven lectures given by the professor which cover the topics listed below. There are also approximately seven or eight industry speakers from local SynBio companies. Each student has to write a reflection following the talk. There were four design challenges and one final design challenge. Design challenges are group projects in which groups need to provide solutions to a proposed question facing the synthetic biology industry/world today. After each project, a few randomly selected groups present their solutions to the class. Each student writes a post-presentations report analyzing their own solution as well as the solutions of the other groups.

PREREQUISITES

CHEM 3A (required) (chem3a.html); BIOE 103 (bioe103.html) or equivalent (listed as required).

BIOE 11 (bioe11.html) was sufficient without BIOE 103 or other Bio or BioE experience.

TOPICS COVERED

- Biofuels
- Metabolism and Metabolic Pathways
 - Terpenes, branched alcohols, PKS, NRPS, Fatty Acids
- Sugar Utilization
- Fermentation
- Directed Evolution
- Synthetic Biology
- Current Bioengineering Industry Speakers

WORKLOAD

COURSEWORK

- 1 midterm, no final
- Participation (attendance)
- 7 Industry Speaker Reflections (2 pages each, double spaced)
- 4 Design Challenge Projects in groups (with possible ungraded presentation in class) and 1 Final Design Challenge Project
- Design Challenge Reports (3 pages each, double spaced)

TIME COMMITMENT

3 hours of lecture per week. Approximately 30 minutes to an hour for each report (~1 per week), approximately 4-5 hours for each project (~1 every three weeks).

CHOOSING THE COURSE

WHEN TO TAKE

The course is only offered in the Fall. The undergraduates in the course are predominantly juniors and seniors, as it is an upper-division elective. The course is not too time-intensive, so it can be taken with any course load.

WHAT NEXT?

The course is an upper division elective. It is unique and does not directly serve as a prerequisite for a class, but it is a useful class to gain insight into synthetic biology in industry and synthetic biology topics.

Last edited: Fall 2018

advising