

NSC 110H Spring 2015
Microbes as Machines
Unique # 47195

Monday 4–5 PM
RLM 5.112
Professor: Barrick

Instructor: Dr. Jeffrey Barrick <jbarrick@cm.utexas.edu>

Office: MBB 1.436 Phone: (512) 471-3247 Office Hours: By Appointment

Description: Synthetic biologists are rewriting the DNA of microorganisms to program and remix them with complex logic, traits, and behaviors that are new to nature. We will discuss recent developments in relevant areas of biotechnology, key examples of engineered biological systems, and how they differ from mechanical devices.

Course format: Each week some combination of scientific papers, news stories, online videos, popular science articles, etc., will be assigned. *Everyone in the class* will fill out a short pre-discussion worksheet on the basis of reading/watching these materials and turn it in at the beginning of the next class period. *Two to three students per week* will be assigned beforehand to read and present a scientific paper to the class. They will have ~10-15 minutes to present the major points from this paper and any additional background information. They should email ~5 slides that include (at the very least) the major figures from the paper to the instructor before class in PowerPoint format.

Course web page: The course web site on the SynBioCyc Wiki will host reading assignments and links to associated content (<http://synbiocyc.org>). Students are encouraged to email the instructor new links or to edit the pages themselves if they find additional material when reading about a topic that is particularly interesting or recent.

Grading: This course is graded **pass/fail**. You will be assigned a grade of **pass** if you: (1) attend and turn in a complete pre-discussion worksheet for **at least ten of the thirteen course meetings**, and (2) present a scientific paper **at least twice** during the course. If you anticipate being unable to meet these criteria, we can discuss alternative ways to make up missing credit. However, you must notify me by at least 2 weeks before the last day of classes (by Apr. 24) to make these alternative arrangements.

#	DATE	TOPIC
	Jan 19	Martin Luther King Day – No class
1	Jan 26	Introduction to Synthetic Biology
2	Feb 2	BioBricks and Standardized Genetic Parts
3	Feb 9	Genetic Part Bestiary
4	Feb 16	DNA Assembly Methods
5	Feb 23	Analog Genetic Circuits
6	Mar 2	Digital Genetic Circuits
7	Mar 9	Development and Pattern Formation
	Mar 16	Spring Break – No class
8	Mar 23	Metabolic Engineering
9	Mar 30	Producing Biomaterials
10	Apr 6	DNA for Information Storage
11	Apr 13	Expanding the Genetic Code
12	Apr 20	Biocontainment
13	Apr 27	Evolutionary Engineering
14	May 4	Refactoring Genomes Evolutionary Reliability

*Schedule subject to change. See <http://synbiocyc.org> for a current schedule.