Microbiology 405: Biotechnology and Synthetic Biology
Course Outline (4 PAGES) – Fall 2017

Course Instructor: Francis Nano
Office: 245 Petch (might move to basement in November, depending on renovations to office/lab.)
Office Hours: M-F 09:00-17:00. It's best to email me for a specific appointment or to see if I'm free right before coming over.

Read carefully. The course is not presented and organized in the traditional manner, but rather is a "flipped classroom". This format has students learn basic material on their own, and uses classroom time for projects. 8 and ECS128. See course calendar for your group's formal meeting dates. I will attend all of these and note students' attendance and participation.

1. All lectures are available both as PDFs and as audio presentations of the Power Point presentations. They are available at the M405 "Course Space" site.

   Course Space can be found at https://www.uvic.ca/cas/login?service=http%3A%2F%2Fcoursespaces.uvic.ca%2Flogin%2Findex.php

   You are expected to view either the PDFs or the audio lectures (or both) on your own. The lectures are divided into groups to help you know what material will be covered on which exam.
2. The projects are meant to inspire both independent and group learning. A reasonable effort should result

Specialized plasmid cloning vectors and systems.

Section 2. DNA sequencing and other technologies

Generation of cDNA.
Fosmids, BACs and YACs.
Sanger DNA sequencing.
Sequencing strategies
2nd and 3rd Generation "next-gen" DNA sequencing.
DNA amplification and genome walking.

Section 3. DNA and Genomic Assembly

Biobricks and Golden Gate
In vitro genome assembly methods (PCR, Gibson, SLIC, Pox)
In vivo genome assembly methods (gap-repair/ TAR)
Approaches to Bacterial Genome Engineering
Bacterial Genome Assembly.
Sidebar: Counter-selection (a "side-bar" means an extra bit of information that is examinable for the concepts; e.g. what is counter-selection and how you use it; but NOT the list of counter-selection genes.)

Section 4. Elements of genetic circuits.

Students who have completed the following elements will be considered to have completed the course and will be assigned a final grade

Students with diverse learning styles and needs are welcome in this course.