

SATURDAY JUNE 8TH, 2013

Synthetic Biology for Computer Programmers

WHAT WILL I LEARN FROM THIS COURSE?

You will get an introduction to the world of biology, biotechnology and synthetic biology. We will take an input/output approach to biological systems by first explaining where biological molecules come from and how they are formed, what they look like and how they perform the many functions that they do. We'll discuss the ability of biological systems to produce a huge variety of chemicals including alcohols, fuels and drugs and what modern methods are used for the manipulation of biological systems. We will cover how biological systems compute and perform logic and how biology can be engineered for such activities. The risks and benefits of genetically modified organisms will be discussed and the startup and industry landscape and new technologies will be reviewed.

WHO SHOULD TAKE THIS COURSE?

This course is designed for people with little or no previous knowledge of biology. We will use analogies and stories from computer science and engineering to describe how cells, genes and organisms function. If you already have an understanding of biology and are looking for an intermediate or advanced courses in synthetic biology or biotechnology then please contact us.

COURSE PRESENTERS:



Dr. Josh Gilmore

Josh received his PhD in Chemistry from University of California Berkeley in 2007.



Dr. John Cumbers

John received his PhD in Molecular Biology, Cell Biology & Biochemistry from Brown University in 2011.



**Dr. Jeffrey Kim,
Radiant Genomics**

Josh received his PhD in Chemistry from University of California Berkeley in 2007.



**Dr. Jeffrey Dietrich,
Lygos**

Jeffrey received his PhD in Bioengineering from UC-Berkeley in 2011.

WWW.SYNB.ORG

GUEST SPEAKERS:

COURSE MODULES:



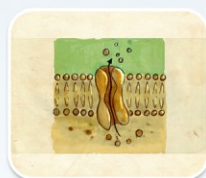
An Introduction to Synthetic Biology.

We will discuss the core principles of biology, including safety, terminology, inputs, outputs and processes.



Synthetic Biology for Brewing

The traditional bailiwick of bioengineering is the improved production of biomolecules through fermentation. Advances in synthetic biology change what we can make and how well we make it.



The Cell is a Microscopic Chemical Factory.

Cell function and regulation can be thought of as the workers, machinery, and management of a factory, accepting deliveries and work orders, shipping out product, and performing repairs, upgrades and modifications.



Thinking with Cells and Cellular Computing

Cellular systems don't use a CPU. Gaining superior control of a cell requires building logical systems with computer science inspiration. Likewise, the distributed cellular system has useful computing applications!



Structure-Activity Relationships.

As we delve deeper into the cell, we see that the way each part functions is correlated to its size, shape and reactivity. This will allow us to classify types of molecule and organize our toolkit.



Understanding Genetically Modified Organisms

GMOs are an emerging concern in the global collective mind. In this section we analyze the concerns, promises, and technology of multi-cellular organism modification and their use outside the laboratory environment.



Manipulating Organisms, Cells, Genes and Genomes.

With a basic understanding of how the cell works, we turn to the core suite of the SynBio toolkit, molecular cloning, directed evolution, screens, and selections.



New Companies and Technologies in the Bioeconomy

Get an overview of synthetic biology startup companies and industry players. We'll also discuss how new technologies are changing the landscape of biotechnology and look at predictions of future technologies to come.

What is the course and why is it unique?

Synthetic Biology for Computer Programmers is a new course conceptualized and written by Dr. Josh Gilmore and Dr. John Cumbers. The course provides a one day interactive class for teaching synthetic biology to non-experts. The course is written for tech-professionals in other fields such as computer science, to learn about the growing power of biology to perform useful tasks and make high value products from drugs to spiders silk.

How will the course be taught?

We'll be using a number of modern teaching aides to make it easy for you to get the most out of the course.

For example, we've structured the modules in manageable segments with a core stories and examples to back up the content being explained. We cut through the jargon and help you to tackle the latest research by using primarily literature and (research papers) in the class. The core course competencies are reinforced in a variety of ways, including interactive Q&A periods.

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The Orrick Building

405 Howard Street, San Francisco, CA 94105



APPLY FOR THE COURSE:

Our courses are small (maximum 40 people) to allow for greater interaction with the teachers. We also try and keep similar groups of people together. If you would like to apply to take part in the course then please email Tricia.Mischler@synb.org with a brief description of your background and why you are interested in taking this course.

REGISTRATION:

Early Bird Registration Deadline is **May 15, 2013**

Student
Early Bird \$150 General \$200

Individual/NonProfit/Government/
Academic
Early Bird \$250 General \$350

Corporations
Early Bird \$350 General \$475

CONTACT:

Questions about the course?
Please email: Tricia.Mischler@synb.org
Call: 410-449-0665.