



## Summer Session 2015 Professional Science Master's Courses

We are offering 1 and 2 credit modules during 2015 May term and summer session. Modules span 2 or more days and are either lecture, computational, or laboratory. The laboratory modules combine hands-on experience with lectures on theoretical background. Any number and combination of modules may be taken and the credits applied toward undergraduate or graduate degrees. **Graduate tuition rates apply**. These sections are **not** open to enrollment through continuing studies.

The modules are listed below. Please contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission numbers. Seats are limited.

Please keep the following in mind. A request for a permission number and registration in any one of the courses is a commitment to complete the course. Please do not request a permission number until you are sure of your commitment. All of the courses are very popular and once a permission number is issued that spot is no longer available to another student.

Information on graduate tuition and fees for summer session can be found on the [Summer Session website](#) under Dates and Fees. Please note all payment and refund deadlines.

### **INTRODUCTORY LEVEL (Appropriate for any student, including those with little or no research experience.)**

#### **MCB 5490-20 Industrial Insights**

##### **Topic - Principles of Quality Assurance in Pharmaceutical Drug Development and Manufacturing**

Dates: June 20, June 27, July 11, and July 18, 2015

1 credit

Enrollment Limit 8

Instructor: Mark Longo

Room BPB 201

June 20, 2015: 9:30 a.m. – 2:30 p.m.

June 27, 2015: 9:30 a.m. – 2:30 p.m.

July 11, 2015: 9:30 a.m. – 2:30 p.m.

July 18, 2015: 9:30 a.m. – 2:30 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Highly recommended for students interested in careers in biotechnology or pharmaceuticals, the course will focus on information relevant to biotechnology and pharmaceutical product development, testing and manufacturing. Students will have ample opportunity to meet and interact with experts from industry. The instructors are from Boehringer-Ingelheim. Lunch may be provided by the PSM program – more information later.

The module **Operations of a Microbiology Laboratory** is only offered once every two years. This module offers specific training in the aspects of running or working in a microbiology lab. The bio-safety risks associated with many microbiology labs warrant specific training.

#### **MCB 5670-20 Theory and Practice of Laboratory Techniques in Microbiology**

##### **Topic – Operations of a Microbiology Laboratory**

Dates: July 29 to July 31, 2015

1 credit

Enrollment Limit 8

Instructors: [Joerg Graf](#) and Emily McClure

Room TLS 201

July 29, 2015: 1 to 5 p.m.

July 30, 2015: 9 a.m. to 5 p.m.

July 31, 2015: 9 a.m. to 5 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Students will be trained in techniques and the use of equipment of particular importance for microbiologists. This includes the use of anaerobic chambers, autoclaves, automatic plate pooter, degassing stations and CO<sub>2</sub> incubators. Students will learn aseptic technique, aerobic, microaerophilic and anaerobic culturing techniques, biosafety considerations, preparation of media and long-term storage of strains.

### **MCB 5670-15 Theory and Practice of Laboratory Techniques in Microbiology**

#### **Topic – Introduction to Bioinformatics**

Dates: May 18 to May 20, 2015

1 credit

Enrollment Limit 8

Instructor: Jonathan Klassen

Room BPB 401

May 18, 2015: 9 a.m. to 5 p.m.

May 19, 2015: 9 a.m. to 5 p.m.

May 20, 2015: 9 a.m. to 5 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. In this module you will be learning basic computational biology skills, particularly the phenomenal advantages of UNIX-style commands for “Big Data” biology and basic scripting using Perl. Given the revolution that has occurred making DNA sequencing incredibly cheap and widely available, dealing with these data is essential for working in the biological sciences.

### **MCB 5670-40 Theory and Practice of Laboratory Techniques in Microbiology**

#### **Topic – Introduction to R for Data Management and Statistical Biology**

Dates: June 15 to June 17, 2015

1 credit

Enrollment Limit 8

Instructor: Kendra Maas

Room BPB 401

June 15, 2015: 12 to 5 p.m.

June 16, 2015: 9 a.m. to 5 p.m.

June 17, 2015: 9 a.m. to 5 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. This module will introduce you to the powerful (and open source!) R computing language. R has become a go to language for working with a wide variety of data; however the learning curve is very steep. This module will help you climb the first stretch of that curve - how to get your data into R, how to manipulate and tidy data, introduction to version control and sharing of your code through Github, and introduction to simple statistics and graphics in R.

### **INTERMEDIATE LEVEL (Requires prior research experience, completion of MCB 5427 Introduction to Molecular Biology Techniques or permission of instructor.)**

### **MCB 5427-50 Laboratory Techniques in Functional Genomics**

#### **Topic – Introduction to Cell Culture Techniques**

Dates: July 20 to July 22, 2015

1 credit

Enrollment Limit 6

Instructor: Michelle Rosado and Charles Giardina

Room TLS 201

July 20, 2015: 9 a.m. to 5 p.m.

July 21, 2015: 9 a.m. to 5 p.m.

July 22, 2015: 9 a.m. to 5 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Prerequisite is MCB 5427 Introduction to Molecular Biology Techniques, relevant research lab experience, or permission of instructor. Participants learn the fundamentals of cell culture. Main topics covered include cell culture media formulation and filtration sterilization, aseptic approaches to cell dissociation and passaging, handling biosafety 2 level cell lines, cell freezing and stock retrieval, monolayer cell transfection methods, and cell viability tests on 96 well plates.

The module **Operations of the Illumina MiSeq** is the prerequisite for the module **Characterization of Microbial Communities by 16S rRNA Gene Sequencing** and preferential enrollment in **Operations of the Illumina MiSeq** will be given to those students who enroll in both modules **Operations of the Illumina MiSeq** and **Characterization of Microbial Communities by 16S rRNA Gene Sequencing**.

### **MCB 5670-16 Theory and Practice of Laboratory Techniques in Microbiology**

#### **Topic – Operations of the Illumina MiSeq**

Dates: May 13 to May 14, 2015

1 credit

Enrollment limit 10

Instructors: Kendra Maas

Room BPB 401

May 13, 2015: 9 a.m. to 5 p.m.

May 14, 2015: 9 a.m. to 5 p.m.

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Prerequisite is MCB 5427 Introduction to Molecular Biology Techniques, relevant research lab experience, or permission of instructor. In this module students will receive training in how to operate an Illumina MiSeq, Agilent Bioanalyzer, and Qubit. Theory of sequencing by synthesis, quality assessment and data analysis will be discussed. Participants will be given an overview of the different applications for the MiSeq that include small genome sequencing, microbial transcriptome sequencing and ultra-deep 16S rRNA gene sequencing. The successful completion of this module is required for users to gain independent access to the MiSeq.

### **MCB 5896-50 Investigation of Special Topics**

#### **Topic – Introduction to Flow Cytometry**

Dates: July 14 to July 16, 2015

1 credit

Enrollment Limit 12

Instructors: Carol Norris and Adam Zweifach

Room TLS 253

July 14, 2015: 9 a.m. to 5 p.m.

July 15, 2015: 9 a.m. to 5 p.m.

July 16, 2015: 9 a.m. to 12 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Prerequisite is MCB 5427 Introduction to Molecular Biology Techniques, relevant research lab experience, or permission of instructor. Overview of fluorescence and fluorescent probes. Basics of cytometer operation (fluidics, optics, data collection, sorting), preparation of samples (labeling reagents and techniques), overview of common FACS assays. Students will perform some simple flow experiments, including sample preparation, data collection, and data analysis.

### **MCB 5896-51 Investigation of Special Topics**

#### **Topic – Protein Purification**

Dates: July 13 to July 17, 2015

2 credits

Enrollment Limit 12

Instructors: Heidi Erlandsen and Victoria Robinson

Room TLS 277

July 13, 2015: 9 a.m. to 5 p.m.

July 14, 2015: 9 a.m. to 5 p.m.

July 15, 2015: 9 a.m. to 5 p.m.

July 16, 2015: 9 a.m. to 5 p.m.

July 17, 2015: 9 a.m. to 12 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Prerequisite is MCB 5427 Introduction to Molecular Biology Techniques, relevant research lab experience, or permission of instructor. Basics of protein purification including (affinity purification, size exclusion chromatography, ion-exchange chromatography). Students will perform a purification of a His-tagged protein, assay the protein concentration by SDS-PAGE and UV-spectrometry, and perform a Western Blot.

**ADVANCED LEVEL (Please see prerequisite requirements for the individual courses listed below.)**

**MCB 5671-02 Advanced Theory and Practice of Laboratory Techniques in Microbiology**

**Topic – Characterization of Microbial Communities by 16S rRNA gene sequencing**

Dates: May 21 to May 29, 2015

2 credits

Enrollment limit 6

Instructors: [Joerg Graf](mailto:Joerg.Graf@uconn.edu), Jacqueline (Jacqui) Benjamino and Allison Kerwin

Rooms TLS 201 (May 21 and May 22, 2015) and BPB 401 (May 27 to May 29, 2015)

May 21, 2015: 9 a.m. to 5 p.m.

May 22, 2015: 9 a.m. to 5 p.m.

May 27, 2015: 9 a.m. to 5 p.m.

May 28, 2015: 9 a.m. to 5 p.m.

May 29, 2015: 9 a.m. to 12 p.m.

Instructor Consent Required

Contact [elaine.mirkin@uconn.edu](mailto:elaine.mirkin@uconn.edu) for permission number. This section is closed to non-degree and BGS enrollment. PSM students have priority enrollment. Prerequisite is MCB 5670 Operations of the Illumina MiSeq or permission from the instructor. In this module, each student will sequence the 16S rRNA genes of a microbial community. Students will learn how to prepare the libraries for running on the MiSeq and analyze the data after the run is completed. The data analysis involves a QIIME pipeline specifically modified for using the larger Illumina data sets.