Biochemistry & Molecular Biology (BMB) 829
Special Problems in Macromolecular Analysis and Synthesis
Fall Semester 2023

Module 2: Recombinant DNA and Genome Editing
Course Syllabus, Policies, and Schedule

Credit Hours: 1
Course meeting days and time: Monday & Wednesday 2:40 – 4 pm
Course location: BCH 111

Instructors

Charles G. Hoogstraten; BMB 829 Course Coordinator
hoogstr3@msu.edu
302D Biochemistry Building
(517) 353-3978 (only checked occasionally)
Office hours: By appointment

Tommy Vo; BMB 829-302 Module 2 Lead Instructor
votommyv@msu.edu
410B Biochemistry Building
Office hours: By appointment

Elena Demireva; BMB 829-302 Module 2 Instructor; Genome Editing
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1111 IQ / Bio Engineering Facility
Office hours: By appointment

Course Description and Objectives

BMB 829 is a modular course that seeks to introduce students to modern molecular and structural/analytical techniques of interest in the biochemistry and molecular biology laboratories. Students may enroll in each of sections 301, 302, 303, 304, and 305 (corresponding to modules 1 through 5) once for a total of up to five credits; however, *Module 1 must be completed before any of the remaining modules can be taken, unless an exception has been granted due to a class scheduling conflict*.

Required Textbook & Course Materials:
No required textbooks; required reading material will be provided by instructors on D2L.

Format:
This course will be taught in-person, with any exceptions announced by the instructor both in class and on D2L. Lectures may be recorded and posted to D2L at the discretion of the instructor. Note that lecture recordings will not be possible in cases of hands-on workshops, facility visits, or technical difficulties.

Homework assignments will be announced by the instructors on D2L and in-class. Lectures 5 and 9 will include an in-class project assignment for which students will be expected to fully participate.

Required Technologies:
This course will make extensive use of the D2L platform at Michigan State (d2l.msu.edu) to communicate course materials of various sorts. An internet connection and device capable of downloading documents, displaying Microsoft Word and PowerPoint and Adobe PDF documents and displaying video are required. Certain lectures with website or computer program demonstrations will require a computational device and internet connection to follow along.

Recommended Texts & Other Materials:
Additional recommended reading and viewing materials will be provided on D2L.

COVID-19 Statement:
BMB 829 fully supports and expects compliance with all stated University policies relating to infectious disease safety. Students declining to follow guidelines relating to appropriate viral safety will be asked to leave the classroom.

Should you find yourself in scheduling, academic, or mental or emotional health difficulties, you are urged to contact Prof. Vo and Prof. Hoogstraten as soon as possible so that appropriate accommodations may be made. In addition, MSU has made extensive resources available through the Keep Learning section of the University website, including academics (https://remote.msu.edu/learning/additional-resources.html) and for students facing challenges related to mental health (https://remote.msu.edu/learning/mental-health.html). Students are encouraged to make full use of any or all of these resources as the need arises.

Learning Continuity Statement:
Should students be unable to attend class for an extended period of time, they should communicate this to the Course Coordinator (hoogstr3@msu.edu) and/or lead instructor for the module (votommyv@msu.edu) as soon possible once the situation becomes evident. Students should work with course instructors to develop a schedule for regular communication and reasonable timelines for completing assignments including exams.

Course Continuity Statement:
Should an instructor be required to be absent for an extended period of time, scheduling of different course modules may be adjusted accordingly. Students may communicate with either the Course Coordinator or any of the other course instructors regarding grading and assessment modifications.

Prerequisites:
Recommended background equivalent to BMB 462. *For all modules except Module 1, prior completion of Module 1 is expected*, unless an exception has been granted due to a class scheduling conflict.

Late Work Policy:
Full credit for late submissions will only be considered if arranged with the Module Lead instructor in advance of the due date. Otherwise, point penalties may be assigned or late work may not be accepted at the discretion of the individual instructor. Communication with the instructor about situations leading to late work as soon as possible is *strongly* advised.

Student Expectations:
All participants in this class are held to the standard set by MSU's Policy on Integrity of Scholarship and Grades. The policy can be read in full at the MSU Ombudsperson's website.

On March 22, 2016, The Associated Students of Michigan State University (ASMSU) adopted the following Spartan Code of Honor:
"As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do."

Disability Access:
Students must inform the instructor and course coordinator at the beginning of the semester, or as soon as reasonably possible after a situation arises during the semester, of any accommodations needed. Information related to disability access is available on the Resource Center for Persons with Disabilities (RCPD) website. Students: to make an appointment with a specialist, call: (517) 353-9642 Or TTY: (517) 355-1293 or visit the RCPD website.

Module Outline and Schedule

Assessments:
The grading rubric of the module will be based on the following, with Dr. Vo's part counting for 55% of the final grade and Dr. Demireva's part for 45%.

In-class participation	25%
In-class projects	25%
Homework assignments	50%

These will be aimed at assessing basic concepts and understanding through problem-solving questions and/or reading of assigned original research papers or review articles. Letter grades will be assigned at the end of the semester and will be curved based on the final distribution of student scores.

Course Outline:
The planned schedule of lecture presentations is presented in the table below, with class meeting number, dates, instructors, and lecture topics.

#	Date	Instructor	Topic
1	Monday, October 2	Vo	**Applications and the regulation of recombinant DNA**
2	Wednesday, October 4	Vo	**Getting started with DNA cloning**
3	Monday, October 9	Vo	**Traditional DNA cloning and PCR methods** **Homework #1 due by 5 PM today**
4	Wednesday, October 11	Vo	**Advanced DNA manipulation and library preparation methods**
5	Monday, October 16	Vo	**Applying bioinformatic resources for rDNA design and analyses** – Laptop with internet access is required for hands-on bioinformatic components **Homework #2 due by 5 PM today**
6	Wednesday, October 18	Demireva	**Introduction to Genome Editing**
-	Monday, October 23		**MSU Break Day – No Class**
7	Wednesday, October 25	Demireva	**CRISPR-Cas Genome Editing technologies** **Homework #3 is due by 5 PM today**
8	Monday, October 30	Demireva	**Diversity and Evolution of CRISPR systems.**
9	Wednesday, November 1	Demireva	**Applications of CRISPR technologies and beyond** **Homework #4 is due by 5 PM today**