

MCB 4034L: Advances Techniques in Microbiology Laboratory

THE Course WILL START October 10/2024

Sections: 14170 Tuesday -Thursday 9:35AM-12:35PM
 14169 Tuesday -Thursday 13:55PM-16:55 PM

MCB4034L is an upper division course on Microbial Biology. This course will cover advanced techniques used to genetically modify microorganisms. It will emphasize bacterial genetics and physiology, however the fundamental techniques used in the course are applicable to archaea and eukaryotic cells. This course will provide a conceptual and practical background in microbiology sufficient to enable students to take more advanced courses in related fields.

Student Learning Outcomes – After successful completion of this course, students will be able to:

- 1) Acquire experience with fundamental molecular biology techniques like DNA isolation, cloning, and protein purification.
- 2) Get the necessary skills to plan and execute fundamental assays directed to genetically modify microorganisms (bacteria).
- 3) Acquire hands on experience and reach an accurate interpretation of laboratory results.
- 4) Associate the concepts learned with potential applications in biotechnology.
- 5) Apply theoretical concepts learned in basic courses to explain experimental results.
- 6) Express the results using technical language to properly report the laboratory achievements.

Laboratory practices: The course will use a combination of practices, in a laboratory setting with online lectures, quizzes and activities delivered through Canvas. Room MCSB 1030

Instructors: Dr. Claudio F Gonzalez **Office:** Genetics Institute, Room 306

Teaching Assistant:

WebPage: Canvas (<https://ufl.instructure.com/>). Please select MCB 4034L.

Online help with classroom technology: <http://helpdesk.ufl.edu/>

Prerequisite: MCB 3020 or MCB 3023, MCB 3020L or MCB 3023L with minimum grades of C

Communication: For questions regarding class and content use the discussion board. For issues on homework assignments and class organization check the syllabus first, the announcements and calendar on Canvas, then post your questions on the discussion board. For all other issues contact the TA of the course, and lastly Claudio Gonzalez.

Contact Information: Use **TEACHER ROLE** in your emails through Canvas

Dr. Claudio F Gonzalez:

Email (the most efficient): ONLY use Canvas e-mail (If you do not have access to the Canvas platform and need to contact us for an **emergency**, use cfgonzalez@ufl.edu)

Phone: 273-8088 (please leave a message and Claudio will call you immediately).

Regular Office hours: **Fridays 9-10 AM** at Genetics Institute, Room 306/Zoom.

By appointment: (only if you cannot make it to office hours) send an e-mail with three suggested times and I will choose one for us to meet.

- **Discussion Board:** A discussion board is available in Canvas. This Canvas tool is very useful, please post and answer questions on class content and organization there. Postings and answers are monitored by the instructors to make sure no mistakes get propagated. There are several discussion themes. Please post your questions in the adequate section. The discussion board is also used for certain graded assignments to prepare for lectures and group work.

Material

- **Textbook:** No textbook is required for this course.

The students should take notes (*abundant in details*) during class to be used in the final report and as study material for the tests.

The course will have the following sections:

Section 14170 (starting 9:35 AM)

Section 14169 (starting 1:55 PM)

Assessment of learning

- **Assignments (400 points):** Activities will be assigned by module. The activities include timed multiple-choice quizzes, study cases etc. The activities are mandatory and count towards the final grade. The questionnaires should be completed by the deadline indicated (NO EXTENSIONS WILL BE ALLOWED).
- **Exams (600 points):** Exams will assess your knowledge of the concepts covered in this class and your ability to apply them by solving problems like those discussed in class. In case we need to use an online proctoring system (it will be opportunely informed).

The assessment will be performed in **1 Mid-term exam plus a Final**.

- **Mid-terms (240 points):** There will be one 50-minute proctored mid-term exam (240 points) with multiple choice questions, true/false. **All exams are mandatory and will count towards the final grade.** Exams will test learning and understanding of material presented in the textbook, in lectures and in assignments as well as integration and application skills.
- **Final (360 points).** It will be held during final week. Questions will assess basic microbiology concepts and advanced comprehension.

Schedule:

Final exam: TBD

The final exam will take place in the Room 1044 and Laboratory rooms of MCS building.

Make-Up policy: If one exam is missed, it will result in a score of 0 for the test (see below for "Excused absences").

Excused absences:

Documentation **MUST** be provided for absences caused by serious illness, accident, jury duty, or death in the immediate family. You must contact the instructor of the missed exam and I will arrange an alternative time for the exam if the absence is properly justified.

After the exam: The grades will be available on Canvas three days after the exam, unless notified by an announcement. Test questions will be made available through Canvas.

Extra credits opportunities

Extra points can be obtained by sending a Final Report.

Guidelines for the final report:

- Students must craft an individual FINAL REPORT.
- Such a report should have a minimum of 3 pages, max 6 pages.
- The report should connect all laboratory assays meaningfully.
- A **conclusion plus a personal statement** regarding genetic manipulation should be included.
- Graphics and flow charts use is highly encouraged.
- Only Original pictures (and charts) obtained during Lab Sections can be included.
- The use of internet downloaded pictures, graphics, flow charts etc. is not allowed (reports will not be considered).

Best 5 reports of the class will be rewarded with 25 points.

The reports not selected in the top group, including all the information requested, will be rewarded with 15 points.

Grading: Straight scale (Tentative)

Grading Scale

A	950 or above
A-	890-949
B+	850-889
B	810-849
B-	780-809
C+	750-779
C	710-749
C-	680-709
D+	630-679
D	600-629
D-	570-599
E	560 or below

MCB 4034L Attendance Policy

Attendance and participation in all lab periods are **mandatory**, and attendance at each lab will be monitored by a sign-in sheet. Only 1 (ONE) non justified absence will be granted during the course. Extra absences will be penalized by deducting points as follows (See table below). This is an intensive and short course with only 14-15 meetings. The students are not allowed to have more than 2 absences in total (combining justified and non-justified). Students with more than two absences **should take the course again**. In all the cases (granted/justified/nonjustified), the absent students will also miss the points obtained in the quizzes delivered during class (no possibility of making up for these points).

Absences due to professional school tests (MCAT, DAT, GRE) and/or professional/graduate school interviews will **NOT be considered exceptions** (see below **Computer Connection**). It is the student's responsibility to schedule these commitments accordingly and not interfere with

laboratory days. Students will still be responsible for entering a lab notebook entry for each missed lab (please “cite” the person from whom you are borrowing data/results for the purpose of completing the missing entry). Likewise, you are responsible for learning any missed course material (lectures, online assignments) for the midterm quiz and final exam, whether an absence is excused, unexcused, or unexpected.

Absences	Points deducted*
1	0
2	50
3	100

* Points deducted per absence are non-cumulative. In example one student with 3 absences will have a total deduction of 150 points. These points will be deducted from the total, the 30 points of the in-class Quizzes will not be recovered in any circumstance.

Academic Honesty: As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.

Software Use: All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

Accommodations for Students with Disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. This office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

UF Counseling Services: available on-campus for students having personal problems or lacking clear career and academic goals includes:

- [University Counseling Center](#), 301 Peabody Hall, 392-1575, personal and career counseling
- [Student Mental Health](#), Student Health Care Center, 392-1171, personal counseling.
- [Sexual Assault Recovery Services \(SARS\)](#), Student Health Care Center, 392-1161, sexual assault counseling
- [Career Resource Center](#), Reitz Union, 392-1601, career development assistance and counseling

Unforeseen life events: For ALL matters that require special consideration, please contact U Matter, We Care in the Office of the Dean of Students (<https://care.dso.ufl.edu/instructor-notifications/>). They will verify your case and contact me with advice on how to deal with your specific situation. I would like to note that a letter or e-mail from them does not guarantee special consideration and deadline extension, it is merely a suggestion on how best to deal with your case. I will make the final decision based on their recommendation after reviewing your case.

University of Florida U Matter

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates,

Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Laboratory schedule (tentative):

Date	Activities in the lab
10/10	General Intro – Genomic DNA Extraction
10/15	Plasmids extractions -
10/17	Electrophoresis and DNA fragment purification
10/22	PCR amplification of a target gene
10/24	P15TV-LIC Digestion – Gel analysis
10/29	LIC setup - DH-5 α transformation
10/31	Recombinant selection – colony PCR
11/05	Recombinant Plasmids extraction –BL21 transform.
11/07	Review (Optional)
11/12	Midterm Test
11/14	Cell lysis - Protein purification by Affinity chromatography
11/19	PAGE and Zymogram
11/21	Enzymology
12/03	Review (Optional)

1. The sequence of the assays may suffer small modifications depending on the experiment's complexity and duration.

Recommendation Letters:

Only students with a final grade of A can apply for recommendation letters in this course.

I strongly suggest attaching a self portrait with the letter request; this will help me to personalize the letter according to the student performance in the classroom.

Mandatory Personal Protective Equipment

During each in person lab period, students are required to always wear a lab coat and face mask. Both will be provided to the student and will be stored in a personal contained ziplock bag to be used all semester. Personal masks are acceptable. You also must wear gloves, closed toed shoes and are strongly recommended to wear long pants or long sweatpants. NO eating, drinking, chewing gum etc. Is allowed in the laboratories. Not following these instructions will result in dismissal from class.

UF In Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation and delivered by any instructor hired or appointed by the University or by a guest instructor as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without the permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to

another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.