COURSE SYLLABUS FOR MCB 4034L: “Advanced Microbiology Lab”
SECTIONS 4D64 and 4D66
1 credit
Summer 2015 (accelerated 6-day format)

COURSE MEETING TIMES AND LOCATION: All Labs will be held in the Microbiology and Cell Science Bldg. (Bldg 981 Museum Road, UF Campus, Gainesville, FL) rooms 1030 and 1026 (teaching labs), according to the times and dates in the schedule at the end of this document. Attendance is required for all lab periods. We will assign you a lab classroom on the first day of class.

IMPORTANT DATES:
Lab classes (UF main campus, Gainesville, FL) – Monday June 22nd – Saturday June 27th, 2015 **for specific meeting times each day please see attached course schedule at the end of this syllabus**

Mid-term exam (in-class) – Thursday, June 25th, 2015

Final presentation (in-class) – Saturday June 27th, 2015

Final exam (UF main campus location TBA OR via ProctorU online proctoring service) – Thursday July 2nd, 2015

Final electronic lab notebook submission (online via Canvas course website) – Friday July 10th, 2015

Final scientific abstract submission (online via Canvas course website) – Friday July 10th, 2015

Bioinformatics assignment (online submission via Canvas course website) – Friday July 10th, 2015

COURSE DESCRIPTION: Application of immunological, molecular biological and microbial techniques to the isolation, identification and characterization of bacteria and viruses.

PRE-REQUISITES: MCB 3020L or MCB 3023L with a grade of C or better. MCB 4203, MCB 4304, PCB 4522 or PCB 5235 recommended

FACULTY CONTACT INFORMATION & OFFICE HOURS:

Dr. Kelly C. Rice, Ph.D.
Microbiology and Cell Science Bldg.
Office Room 1147
(352)-392-1192 (Office)
Email: kcrice@ufl.edu
Office hours: Daily (June 22 – June 27)
from 12:30 pm – 1 pm;
June 28th – July 10th by appointment

TEACHING ASSISTANTS: Austin Mogen (Graduate TA; email amogen@ufl.edu), Shawna Amini (Undergraduate TA; email shawnaamini@ufl.edu), Chinh Le (Undergraduate TA)

COURSE OBJECTIVES: Upon completion of this course, students should be able to:

1. Gain hands-on experience with several “advanced” microbiology and molecular biology techniques (i.e. isolation of DNA and RNA, dot blot analysis, real-time PCR, phage transduction)
2. Understand the theory, advantages, and potential limitations of these techniques
3. Perform data analysis & interpretation of experimental results using a variety of software and web-based resources
4. Properly document experiments, results, and data analysis using an electronic laboratory notebook
5. Complete objectives 1-4 in the context of a research project.
6. Report the findings of this research project by writing a scientific abstract.

**REQUIRED TEXTBOOK:** No textbook is required. All course materials will be available through Canvas.

**Background reading materials, lecture notes, on-line assignments, pre-lab quizzes, and other tools for this course will be available through the Canvas Learning Support System homepage [http://lss.at.ufl.edu/]. You will need to enter your GatorLink username and password to access the system. If you do not have an active GatorLink ID, cannot remember your GatorLink login information, or if your ID does not work, please refer to the GatorLink website [http://gatorlink.ufl.edu] or to the UF Computing Help Desk (The Hub, 392-HELP) for assistance.

A note regarding course materials and copyright: All course materials posted on the Canvas course website are assembled and intended for students taking MCB4034L ONLY, and this is why they are only available for student use from the secure Canvas course website. Currently, the format is such that you may download most course materials (lectures, notes, etc) from Canvas for “offline” study purposes while you are enrolled in the course. However, re-posting of any of these materials to websites such as “course-hero”, You Tube, or Facebook is strictly forbidden by the course instructor and is a violation of copyright policies. Unauthorized re-posting of all course materials (including textbook pdfs) infringes on UF’s copyright policies and the "Fair Use" Act (http://www.generalcounsel.ufl.edu/faq/Copyright.pdf).

**SUPPLIES:** Lockers are available in the hallway to store your personal belongings during the lab period. A lock for your locker (during lab only) is recommended. Disposable gloves and other personal protective equipment will be provided as needed. Please dress appropriately in consideration of the lab activity (i.e. use of stains). FOR SAFETY REASONS, STUDENTS MUST WEAR CLOSE-TOED SHOES WHILE WORKING IN THE LAB. STUDENTS THAT DO NOT COMPLY WITH THIS REQUIREMENT WILL BE ASKED TO LEAVE THE LAB, WILL BE PENALIZED 25 POINTS (AS DESCRIBED UNDER ATTENDANCE POLICY BELOW), AND ARE RESPONSIBLE FOR MAKING UP ANY ENSUING MISSED COURSE WORK.

**ATTENDANCE POLICY:** Attendance and participation in all lab periods is mandatory, and attendance at each lab will be monitored by a sign-in sheet. If a student misses a lab, 25 points will be deducted from his/her overall grade at the end of the semester for each unexcused absence. The ONLY exception to the 25 point deduction is if a student has to miss a lab due to religious observance, illness, or bereavement, (documentation/proof for the latter 2 categories may be required). Absence due to professional school tests (MCAT, DAT, GRE), professional/graduate school interviews, or any other obligations will NOT be considered exceptions to the 25 point deduction; it is the student’s responsibility to try and avoid scheduling these commitments on lab 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.

“MAKE-UP” IN-CLASS ASSIGNMENT/EXAMS: The administration of make-up assignments and/or exams is at the discretion of Dr. Rice, and will be assessed on a case-by-case basis. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

**REFERENCE LETTER POLICY:** Upon request, Dr. Rice will write reference letters for students (applying to graduate and/or professional school only) that meet the following conditions: (1) Student has achieved a final letter grade of “A” in the class, (2) Student has no unexcused absences, (3) Student has no incomplete or missing coursework (on-line and in-class assignments, quiz, final exam, etc.), and (4) Student has actively-participated in class discussions and/or has met with Dr. Rice during office hours.

**GRADES:** For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx. The grading scheme for this course is as follows-

- Mid-term exam - 200 points
- Bioinformatics assignment - 100 points
- Electronic Lab Notebook – 150 points
- Scientific abstract-writing assignment – 150 points
Final class presentation – 100 points
Final Exam - 200 points
Pre-lab quizzes (5 @ 20 points each) – 100 points

TOTAL POINTS - 1000

Final letter grades will be assigned based on the number of points earned, as follows:

A = 935-1000 points  C+ = 770-799.9 points
A- = 890 – 934.9 points  C = 730-769.9 points
B+ = 870 – 889.9 points  C- = 700-729.9 points
B = 840-869.9 points  D+ = 650-699.9 points
B- = 800-839.9 points  D = 600-649.9 points
E = 0-599.9 points

**MID-TERM EXAM:** There will be one mid-term exam to be given in-class on THURS JUNE 25th. YOU MUST BRING YOUR LAPTOP AND PICTURE ID TO THE EXAM. YOU MAY ALSO BRING A CALCULATOR, HOWEVER CELL PHONES ARE NOT PERMITTED.

**FINAL EXAM:** A final exam (similar in format to the midterm) will be given on THURS JULY 2nd. The final exam for this course will be administered on-campus in the teaching labs or via ProctorU from 6:45 pm – 9:45 pm. If taking the exam on-campus, you will need to bring your laptop and picture ID to the exam. If taking the exam by distance (via online proctoring service), you will need to follow the directions of the proctoring service (to be provided).

If you cannot bring a computer to class, you must make alternative arrangements with the course instructor at least 2 days prior to the exam.

**LABORATORY NOTEBOOK:** All students are required to maintain an electronic laboratory notebook (ELN) that details the completion of all laboratory experiments performed during the semester. Detailed instructions on how to properly document and maintain your ELN will be given by Dr. Rice during the first day of class. It is highly recommended to update your ELN after each lab. ELNs will be due for final grading on TUESDAY JULY 7th.

**ABSTRACT-WRITING ASSIGNMENT, BIOINFORMATICS ASSIGNMENT, AND FINAL PRESENTATION:** More information on these assignments will be provided during the first day of class.

**PRE-LAB QUIZZES:** Five on-line pre-lab quizzes will be administered through the MCB4034L Canvas course website throughout the week. These open-book quizzes are designed to promote reading of the lab protocols before they are performed in class, and will typically be comprised of 5-10 multiple choice or fill-in-the-blank type questions based on the relevant lab protocols. ACCESS TO THE PRE-LAB QUIZZES WILL ALWAYS BE OPEN FOR A 24 HOUR PERIOD PRIOR TO THE DUE DATE/TIME POSTED IN THE ATTACHED SCHEDULE.

**IF A STUDENT FAILS TO COMPLETE AN ON-LINE ASSIGNMENT OR PRE-LAB QUIZ PRIOR TO THE DUE DATE, THEY WILL RECEIVE 0 POINTS FOR THAT ASSIGNMENT OR QUIZ. ABSOLUTELY NO EXTENSIONS OR “MAKE-UP” QUIZZES WILL BE GIVEN, WITH THE EXCEPTION OF PROOF OF TECHNICAL DIFFICULTY PRECLUDING ON-TIME SUBMISSION (SEE BELOW).**

**CANVAS HINTS for ONLINE QUIZZES AND ASSIGNMENT SUBMISSION:** It is recommended that you take online assessments during Help Desk hours whenever possible. If you have a problem while taking an Assessment, log out and log back in as quickly as possible. If the assessment is timed, the timer will continue to run while you are logged out. If you still encounter difficulties, take a screen shot of the problem so the Help Desk can investigate and you will have proof of the problem for your Instructor. Call the Help Desk (352-392-4357) immediately. When you submit an Assignment you get a confirmation screen that contains a confirmation number. You might want to capture a screen shot or print it for your records. The Assignment list will also show this Assignment as "submitted" including the date and time of your submission. If you do not get the confirmation screen and your Assignment is not listed as "submitted," you have not submitted the Assignment.
ONLINE COURSE EVALUATION: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at [https://evaluations.ufl.edu](https://evaluations.ufl.edu). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at [https://evaluations.ufl.edu/results/](https://evaluations.ufl.edu/results/).

**Academic Honesty, Software Use, Campus Helping Resources, Services for Students with Disabilities:**

**Academic Honesty:** As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: [https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/](https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/)

**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.

These policies will be vigorously upheld at all times in this course.

**Campus Helping Resources:** Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

*University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)*

Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Training Programs
Community Provider Database

*Career Resource Center, First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://www.crc.ufl.edu/)*

**Services for Students with Disabilities:** The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)

**Distance Learning:** Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See [http://distance.ufl.edu/student-complaints](http://distance.ufl.edu/student-complaints) for more details.
LABORATORY TOPICS draft* and KEY DUE DATES

*Please note: Exact lab topics may change prior to start of course but due dates and meeting times will all be the same. A Final Lab Outline will be emailed to all enrolled students 1-2 weeks before the course start date.

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<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>NOTES</th>
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<tbody>
<tr>
<td>MON JUNE 22</td>
<td>Introduction to Course, pre-learning assessment, discuss ELNs</td>
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<td>LAB 1: Screen Transposon mutant library for virulence phenotypes; sub-culturing for LABS 2-3</td>
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<td>LAB 2: C. elegans culture</td>
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<td>TUES JUNE 23</td>
<td>LAB 3: Analysis of LAB 1 results</td>
<td>Pre-lab quiz #1 due by 9 AM</td>
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<td>LAB 4: Isolate genomic DNA</td>
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<td>LAB 5: Phage transduction of transposon mutant</td>
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<td><strong>Go over Final presentation assignment</strong></td>
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<td>WED JUNE 24</td>
<td>LAB 6: Calculate DNA purity &amp; concentration; Setup PCR check of genomic DNA</td>
<td>Pre-lab quiz #2 due by 9 AM</td>
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<td>LAB 7: Analyze transduction results</td>
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<td>LAB 8: subculture wild-type &amp; mutant cultures for C. elegans infections (LAB 9)</td>
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<td><strong>Go over abstract-writing assignment, REVIEW FOR MIDTERM EXAM</strong></td>
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<td>THURS JUNE 26</td>
<td>Morning - MIDTERM EXAM (covers LABS 1-7 lectures and lab experiments)</td>
<td>Pre-LAB QUIZ #3 DUE BY 9 AM</td>
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<td>LAB 9: C. elegans infection part 1</td>
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<td><strong>Go over Bioinformatics assignment</strong></td>
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<td>FRI JUNE 27</td>
<td>LAB 10: C. elegans infection part 2 (worm behavior, fluorescent microscopy)</td>
<td>Pre-lab quiz #4 due by 9 AM</td>
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<td>LAB 11: RNA isolations from C. elegans infection</td>
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<td>LAB 12: Determine RNA purity/concentration, cDNA synthesis</td>
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<td>SAT JUNE 28</td>
<td>LAB 13: Agarose gel electrophoresis</td>
<td>PRE-LAB QUIZ #5 DUE BY 9 AM</td>
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<td>LAB 14: Real-time PCR of cDNA to quantify gene expression</td>
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<td>REVIEW SESSION (FINAL PRESENTATIONS DURING AFTERNOON PERIOD)</td>
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<td>WED, JULY 1st</td>
<td>Online chat review for final exam (Canvas)</td>
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<td>THURS JULY 2nd</td>
<td>FINAL EXAM</td>
<td>UF CAMPUS (LOCATION TBA) OR PROCTORU</td>
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<td>FRI JULY 10th</td>
<td>FINAL ELNs, Abstract assignments, and Bioinformatics assignments are due by 11:59 pm (Canvas)</td>
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DEPARTMENT OF MICROBIOLOGY AND CELL SCIENCE LABORATORY REGULATIONS

1. Eating, drinking (this includes bottled water!), or smoking is not allowed in the laboratories.

2. Do not block the hallway while you are waiting to enter the laboratory. Sit in the classroom or on the benches in the hallway.

3. Note the locations of the emergency showers, fire extinguishers, fire exits, and restrooms.

4. At the beginning and end of each laboratory period, wipe off the top of your laboratory bench with the disinfectant solution provided at the end of each row.

5. Keep your work area free of non-essential materials at all times. The plastic tub from your locker should be kept on the shelf below the benchtop, as it is VERY flammable. Coats, purses, cell phones, headphones, iPods, backpacks, laptop computers, etc. are NOT to be brought into the lab, for safety reasons. Lock valuables in your hall locker. Your lab notebook, writing utensil(s), and printed instructions are exceptions to this rule (these items can be brought into the lab), but take care to keep these items clean. For example, keep these items in a clean area of your bench well away from any active work areas, do not handle these items while wearing gloves, etc.

6. Long hair should be tied back during the laboratory period, and loose clothing should be kept well away from the Bunsen burner flames. **Please dress appropriately in consideration of the day’s lab activity (i.e. use of stains). For safety reasons, students must wear close-toed shoes while working in the lab. Students that do not comply with this requirement will be asked to leave the lab, and are responsible for making up any ensuing missed course work.** Avoid putting pens, pencils, fingers, etc. into your mouth.

7. **Always wear disposable gloves (provided) when working with live bacterial cultures and stains. Dispose of used gloves in the BIOHAZARDOUS BAGS (see number 8 below).**

8. Learn the correct and safe way of discarding items in the lab. Pipets should be placed into the stainless steel trays, pointing in a single direction. Culture tubes and flasks should have the markings removed with alcohol and be placed into the appropriate racks. Contaminated disposables are to be put into the BIOHAZARDOUS BAGS and/or into containers specially provided for this purpose. Non-contaminated trash must be put into the regular trash cans, NOT Biohazardous bags. Bacterial cultures must NEVER BE Poured DOWN THE SINK, NOR SHOULD THEY BE REMOVED FROM THE PREMISES.

9. **Immediately** report all accidents such as cuts, burns, spilled cultures, spilled stains, to the instructor. Take all precautions to avoid such accidents. Report any classmate who habitually demonstrates hazardous behavior.

10. Wash your hands with soap and water before leaving the laboratory, as well as any time during period as needed.

11. Consistent carelessness or disregard of these regulations may be cause for dismissal from the course.