

# Virology Bootcamp

## Advanced Laboratory

### Course Summary

This is an upper division laboratory course covering basic cell culture techniques and virology assays. This course will cover procedures used to generate, propagate, and enumerate viruses using cell culture and molecular methods.

### Learning Objectives and Outcomes

After successful completion of this course, students will be able to:

1. Maintain mammalian cells in laboratory culture and identify healthy, dying and virally infected cells.
2. Generate and grow viruses in culture.
3. Detect and quantify viruses using infectious, genetic and antibody-based methods.
4. Implement the use of proper controls within an experiment and employ standard analysis software to analyze class-generated results.

### Laboratory Overview

This course will incorporate the use of online materials, in-lab lectures, and hands-on activities to facilitate learning of course material. Canvas will be used to provide students with course materials, facilitate instructor communication, and exams. Students will be required to review course materials prior to class to ensure they have a base knowledge of the day's activities. Short (5 min) quizzes on this material will be given at the beginning of class.

### Laboratory Meeting Times

Each lab day will last from approximately 9 am – 5 pm beginning Thursday, May 5<sup>th</sup> and ending on Monday, May 9<sup>th</sup>. See the course outline at the end of the syllabus for any variations in meeting time.

### Material and Supply Fees

M&S fees are charged for this laboratory course. Please see the UF catalog for current costs.

### Instructor

Dr. Melissa Jones

Office: MCB 1148

Phone: 352-392-5923

Email: through Canvas

### Prerequisites

MCB3020L or MCB3023L, MCB4503 is not required but recommended.

### Discussion Board

One of the most useful Canvas tools for communicating information is the discussion board. Dr. Jones will post commonly asked questions (and their answers). If you have general questions about the lab or a lab exercise, it is very likely that another student has the same question. Please post these questions on the discussion board. Postings and answers are monitored by the instructor and TAs to make sure no mistakes are propagated.

### Office hours

By appointment. To set up an appointment, send an e-mail to Dr. Jones with three suggested times.

### Textbook

There is no required textbook for the course

## Laboratory Assessment

Each student has the opportunity to earn 500 total points. Points will be earned through quizzes, lab write-ups and a final exam. The point breakdown for each of these categories is outlined below.

- Attendance/Participation: 50 points (10 points per class period)
- Quizzes: 50 points (10 points each)
- Lab Write-up: 200 points
- Exams: 200 points (100 points each)

## Attendance/Participation

Attendance to all laboratory sessions is **mandatory** and your instructor will record attendance. Should a conflict arise, notify your lab instructor in advance if possible and find arrangements to make up the missed material and quizzes. Unexcused absences will result in a zero for that day's attendance. You must e-mail your instructor within 24h before/after the missed lab to qualify for makeup opportunity and provide valid written excuse.

## Quizzes:

In-lab quizzes given at the beginning of class on and will cover the concepts and techniques to be discussed/performed during that lab period. These quizzes will be graded for completion, not accuracy. Tardy students will be given any time remaining to complete the quiz, but will not be given the full quiz time to complete the assessment. Students who arrive after the quiz time has expired will not be allowed to take the quiz. The aid the instructor in finding gaps in understanding of the days exercise, so those can be focused on during the day. Points will only be deducted if students do not complete the quiz (e.g. if they are tardy and run out of time).

## Lab Write-up

At the conclusion of the lab, data from the lab groups will be compiled and students will generate a final report of the data. This report will require the use of data generated in class and lab groups are responsible for posting their data on Canvas in the format provided by the instructor by the deadline provided at the beginning of the module. Late postings, incomplete postings, or those not in the proper format will result in point reductions on the write-up for students in that group.

## Exams

There will be one midterm exam given mid-way during the course and one final exam given the week after the course ends. Each exam will be given through Canvas. The mid-term will be given in class and will also include a "practical" portion that will involve the techniques and assays used in the previous lab days. The final exam will be taken through Honorlock. No cheating and plagiarism is allowed. If caught cheating or plagiarizing for particular assignment, project, or exam. You will be reported to the Dean of Student office (DSO) per UF policy.

## Grading

Grading Scale			
	Percentage		Percentage
A	93.0 - 100%	C	72.0 - 75.99%
A-	89.0 - 92.99%	C-	69.0 - 71.99%
B+	86.0 - 88.99%	D+	66.0 - 68.99%
B	82.0 - 85.99%	D	62.0 - 65.99%
B-	79.0 - 81.99%	D-	59.0 - 61.99%
C+	76.0 - 78.99%	E	58.99% and below

## Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## Library access

The university library has access to the majority of medical and scientific journals as well as a variety of virology and microbiology textbooks in electronic format. UF students can access these resources through the UF libraries website (<http://library.health.ufl.edu>). However, students must be on the UF network (on campus or remotely through the UF VPN). Instructions for accessing the UF VPN is provided on the course Canvas page.

## Attendance and Make-up Policy:

Laboratory attendance is mandatory and daily attendance will be monitored. Students are expected to be on time and prepared for the activities of the day. Excess of 1 unjustified absence will result in point deductions. More than 2 absences may result in expulsion from the course. This is a short, intensive course with many exercises and concepts built on the previous class. As a result, there is no possibility to make-up work from missed laboratory classes and students will not be able to obtain points from that class (i.e. no quiz make-up, etc.) unless the absence is excused. For all absences, documentation **MUST** be provided (doctors note, notification of military service, etc.). Further information regarding make-up exams, assignments and other work can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

## Students with disabilities:

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (<https://disability.ufl.edu/get-started/>). It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

## Online Course Evaluation Process:

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Evaluations can be completed through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summary results of these assessments are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## Academic Honesty

As a student at the University of Florida, you have committed yourself and are bound 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 by abiding by the Honor Code." 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: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

### In-Class Recordings:

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. They only allowable purposes are: (1) for personal educational use, (2) in connection with a complaint to the university, or (3) evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited.

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 that 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 student presentations, academic exercises involving solely student participation, assessments (quizzes, tests, exams), private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without 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.

### 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.

### 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. Both the Counseling Center and Student Mental Health Services provide 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.

- U Matter, We Care: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
- University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

## Academic Resources:

- E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).
- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.
- On-Line Students Complaints: View the Distance Learning Student Complaint Process.

Date Start and <b>Estimated</b> End Times	Topic		Notes
<b>Day 1 (Sun):</b> 9 AM – 5 PM	Lab 1	<ul style="list-style-type: none"> <li>Determining Cell Health and Confluency</li> </ul>	
	Lab 2	<ul style="list-style-type: none"> <li>Transfection</li> </ul>	
	Lab 3	<ul style="list-style-type: none"> <li>Harvesting Cells, Counting Cells and Determining Cell Concentration</li> </ul>	
	Lab 4	<ul style="list-style-type: none"> <li>Plaque Assay – Seed Cells</li> </ul>	
	Lab 5	<ul style="list-style-type: none"> <li>Endpoint Titration – Split cells</li> </ul>	
<b>Day 2 (Mon):</b> 9 AM – 5 PM	Lab 6	<ul style="list-style-type: none"> <li>Harvesting Transfected Cells</li> </ul>	<u>Mid-term review</u>
	Lab 7	<ul style="list-style-type: none"> <li>Plaque Assay - Dilute Virus Prep and Infect Cells</li> </ul>	
	Lab 8	<ul style="list-style-type: none"> <li>Plaque Assay - Virus Overlay</li> </ul>	
	Lab 9	<ul style="list-style-type: none"> <li>End point titration – Seed Cells</li> </ul>	
<b>Day 3 (Tues):</b> 10 AM – 5:00 PM	<b>MIDTERM</b>		<u>Bring laptop/tablet to class!</u>
	Lab 10	<ul style="list-style-type: none"> <li>Endpoint titration – Dilute Virus Prep and Infect Cells</li> </ul>	
	Lab 11	<ul style="list-style-type: none"> <li>Extraction of RNA from Virus Preps</li> </ul>	
	Lab 12	<ul style="list-style-type: none"> <li>Synthesis of cDNA from Virus Sample</li> </ul>	
	Lab 13	<ul style="list-style-type: none"> <li>Quantitative PCR (qPCR) of Virus Prep</li> </ul>	
<b>Day 4 (Wed)</b> 9 AM – 4:00 PM	Lab 14	<ul style="list-style-type: none"> <li>Preparing a Standard Curve for ELISA</li> </ul>	
	Lab 15	<ul style="list-style-type: none"> <li>Using ELISA to Quantify Virus Prep</li> </ul>	
	Lab 16	<ul style="list-style-type: none"> <li>Endpoint titration - CPE scoring - Day 1</li> </ul>	
<b>Day 5 (Thurs)</b> 9 AM – 2 PM	Lab 17	<ul style="list-style-type: none"> <li>Plaque Assay - Staining</li> </ul>	<b>COURSE REVIEW &amp; WRAP-UP</b>
	Lab 16	<ul style="list-style-type: none"> <li>Endpoint titration - CPE scoring -Day 2</li> </ul>	
	Lab 18	<ul style="list-style-type: none"> <li>Analysis of ELISA</li> </ul>	
	Lab 19	<ul style="list-style-type: none"> <li>Analysis of qPCR</li> </ul>	

