Cover Sheet: Request 13519

MCB 4XXXL Virology Laboratory

Info

Process	Course|New|Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Melissa Jones mmk@ufl.edu
Created	1/14/2019 10:49:50 AM
Updated	2/3/2020 8:11:17 AM
Description of request	New undergraduate laboratory in virology

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Microbiology and Cell Science 514910000	Eric Triplett		3/13/2019
UCC External Consultations_Jones_Virology Lab.pdf					2/22/2019
College	Approved	CALS - College of Agricultural and Life Sciences	Joel H Brendemuhl	Edits requested by the CALS CC have been addressed.	12/9/2019
No document changes					
University Curriculum Committee	Commented	PV - University Curriculum Committee (UCC)	Lee Morrison	Added to the January agenda. If approved, this will go into effect for the Summer B 2020 term with the publication of the 2020-2021 undergraduate catalog.	1/17/2020
No document changes					
University Curriculum Committee	Conditionall Approved	PV - University Curriculum Committee (UCC)	Casey Griffith	How will this course fit into the current curriculum? How will students with excused absences makeup missed material?	1/23/2020
No document changes					
College	Approved	CALS - College of Agricultural and Life Sciences	Joel H Brendemuhl	Corrections requested by the UCC have been addressed.	2/3/2020
Virology Lab Syllabus- updated.pdf					2/3/2020
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			2/3/2020
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					

Step	Status	Group	User	Comment	Updated
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|New for request 13519

Info

Request: MCB 4XXXL Virology Laboratory
Description of request: New undergraduate laboratory in virology
Submitter: Melissa Jones mmk@ufl.edu
Created: 2/3/2020 8:00:41 AM
Form version: 14

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
MCB

Course Level
Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.).

Response:
4

Number
Enter the three digit code indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this may be XXX until SCNS assigns an appropriate number.

Response:
XXX

Category of Instruction
Indicate whether the course is introductory, intermediate or advanced. Introductory courses are those that require no prerequisites and are general in nature. Intermediate courses require some prior preparation in a related area. Advanced courses require specific competencies or knowledge relevant to the topic prior to enrollment.

Response:
Advanced

• 1000 and 2000 level = Introductory undergraduate
• 3000 level = Intermediate undergraduate
• 4000 level = Advanced undergraduate
• 5000 level = Introductory graduate
• 6000 level = Intermediate graduate
• 7000 level = Advanced graduate

4000/5000 and 4000/6000 levels = Joint undergraduate/graduate (these must be approved by the UCC and the Graduate Council)

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
L

Course Title
Enter the title of the course as it should appear in the Academic Catalog.

Response:
Virology Laboratory

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 21 characters (including spaces and punctuation).

Response:
Virology Lab

Degree Type
Select the type of degree program for which this course is intended.

Response:
Baccalaureate

Delivery Method(s)
Indicate all platforms through which the course is currently planned to be delivered.

Response:
On-Campus

Co-Listing
Will this course be jointly taught to undergraduate, graduate, and/or professional students?

Response:
No

Co-Listing Explanation
Please detail how coursework differs for undergraduate, graduate, and/or professional students. Additionally, please upload a copy of both the undergraduate and graduate syllabus to the request in .pdf format.

Response:
N/A

Effective Term

Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic?
Select "Yes" if the course can have rotating (varying) topics. These course titles can vary by topic in the Schedule of Courses.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion, or select "Variable" if the course will be offered with variable credit and then indicate the minimum and maximum credits per section. Note that credit hours are regulated by Rule 6A-10.033, FAC. If you select "Variable" for the amount of credit, additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
1

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or

headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

• Regularly Scheduled [base hr]
• Thesis/Dissertation Supervision [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 50 words or fewer. See course description guidelines.

Response:
Laboratory course covering basic virology assays used to generate, propagate and enumerate viruses using cell culture and molecular methods.

Prerequisites
Indicate all requirements that must be satisfied prior to enrollment in the course. Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be formulated so that it can be enforced in the registration system. Please note that upper division courses (i.e., intermediate or advanced level of instruction) must have proper prerequisites to target the appropriate audience for the course.

Response:
MCB3020L or MCB3023L

Completing Prerequisites on UCC forms:

• Use "&" and "or" to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite.

Example: A grade of C in HSC 3502, passing grades in HSC 3057 or HSC 4558, and major/minor in PHHP should be written as follows:
HSC 3502(C) & (HSC 3057 or HSC 4558) & (HP college or (HS or CMS or DSC or HP or RS minor))

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system.

Response:
none

Rationale and Placement in Curriculum
Explain the rationale for offering the course and its place in the curriculum.

Response:
This course will educate students on the fundamental techniques for culturing and detecting viruses. This course will add to the laboratory courses currently offered in the Microbiology and Cell Science curriculum and provide students with additional training and a broader knowledge base. Microbiology majors can take this lab instead of advanced lab or as additional lab, which will count towards their departmental electives.

Course Objectives
Describe the core knowledge and skills that student should derive from the course. The objectives should be both observable and measurable.

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

Course Textbook(s) and/or Other Assigned Reading
Enter the title, author(s) and publication date of textbooks and/or readings that will be assigned. Please provide specific examples to evaluate the course.

Response:
none

Weekly Schedule of Topics
Provide a projected weekly schedule of topics. This should have sufficient detail to evaluate how the course would meet current curricular needs and the extent to which it overlaps with existing courses at UF.

Response:
Module 1a (week 1): Introduction to cell culture
Module 1b (week 2): Counting cells, determining cell viability and calculating cell concentration
Module 1c (week 3): Maintaining cells in culture and plating cells for experimental use.
Module 2a (week4): Using cell culture to generate viruses
Module 2b (week 5): Plaque Assays for virus enumeration
Module 2c (week 6): TCID50 assay for virus enumeration
Module 2d (week 7): Determining multiplicity of infection (MOI) and analysis of Plaque Assay and TCID50 results

week 8: REVIEW SESSION
week 9: MIDTERM EXAM

Module 3a (week 10): Nucleic acid extraction
Module 3b (week 11): Detecting viruses using PCR
Module 3c (week 12): Gel electrophoresis
Module 4a (week 13) : Virus – antibody interactions, working with antibodies
Module 4b (week 14): ELISA

week 15: EXAM REVIEW
week 16: FINAL EXAM

Links and Policies
Consult the syllabus policy page for a list of required and recommended links to add to the syllabus. Please list the links and any additional policies that will be added to the course syllabus.
Please see: syllabus.ufl.edu for more information

Response:
Grading:

A	930 points or above (93% and above)	D+	630-679 (63.9 – 67.9%)
A-	890-939 (89.0 – 93.9%)	D	600-629 (60.0 – 62.9%)
B+	850-889 (85.0 – 88.9%)	D-	570-599 (57.0 – 59.9%)
B	810-849 (81.0 – 84.9%)	E	569 or below (56.9% and below)
B-	780-809 (78.0 – 80.9%)		
C+	750-779 (75.0% - 77.9%)		
C	710-749 (71.0 – 74.9%)		
C-	680-709 (68.0 – 70.9%)		

Grades and Grade Points: For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.

Attendance Policy and Make-ups: Laboratory attendance is required and attendance will be recorded. Should a conflict arise, notify your lab instructor in advance if possible and find arrangements to make up the missed material and quizzes. If advance notice is not possible, your instructor should be emailed within 24hrs of the missed class. Valid documentation for the absence must be provided. Excused absences and make-up of missed work will follow UF policy. Further information regarding class attendance and make-up exams, assignments and other work can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx. Unexcused absences will result in a zero for that day's attendance.
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 feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: https://gatorevals.aa.ufl.edu/students. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results 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 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:
http://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.
Microsoft Software for UF students
http://www.software.ufl.edu
The Office of Information Technology has great news for University of Florida students! If you want to upgrade your operating system or need Microsoft Office Suite, this media will be available in the Spring 2011 semester. The different media available are: Windows 7 operating system Upgrade, Microsoft Office Professional Plus 2010 (32-bit/64-bit) for PC or Microsoft Office for Mac 2011. Software is free for UF students.
To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357). Once the media is available, you can get it at the UF Computing Help Desk or at the UF Bookstore .
Other software training opportunities are available. For examples through Lynda.com
http://www.lynda.com/member.aspx

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 accommodations 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, https://disability.ufl.edu/

Campus Helping Resources: Students experiencing crises or personal problems that interfere with their general wellbeing 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
Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Wellness Coaching
• U Matter We Care, www.umatter.ufl.edu
• Career Connections Center, First Floor JWRU, 392-1601, https://career.ufl.edu

Student Complaints:
• Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code
• Online Course: http://www.distance.ufl.edu/student-complaint-process

Grading Scheme
List the types of assessments, assignments and other activities that will be used to determine the course grade,

and the percentage contribution from each. This list should have sufficient detail to evaluate the course rigor and grade integrity. Include details about the grading rubric and percentage breakdowns for determining grades.

Response:
Laboratory Assessment: Each student has the opportunity to earn 1000 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: 70 points (5 points per non-exam class period)
- Quizzes: 120 points (10 points each)
- Lab Write-up: 500 points (125 points each)
- Exams: 310 points (155 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. Students who miss lab because of an excused absence will have the opportunity to learn the skills they missed during a one-on-one makeup with the instructor or a teaching assistant.

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.

Lab Write-ups: Lab write-ups are based on lab exercises and will include presentation and discussion of the data gathered and application of the information learned in class. At times the write-ups will require the use of data generated in class. For write-ups where class data is compiled, 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. A template for the expected format for the write-ups will be handed out at the beginning of the module and also posted on the course Canvas page. Lab Write-ups must be submitted via Canvas no later than 11:59 PM on the due date and will be graded in accordance with the rubric posted with the assignment.

Exams: There will be one midterm exam given during the semester and one final exam given during exam week. Each exam will consist of an online/written portion given through Canvas and a practical portion. These exams are mandatory and a review session will be held during the lab period prior to each exam.

Instructor(s)
Enter the name of the planned instructor or instructors, or "to be determined" if instructors are not yet identified.

Response:
Dr. Melissa Jones

UF UNIVERSITY of FLORIDA

UCC: External Consultations

External Consultation Results (departments with potential overlap or interest in proposed course, if any)

Department	Name and Title
Plant Pathology	Jane E. Polston, Professor
Phone Number	**E-mail**
352-273-4627	jep@ufl.edu

Comments

This course teaches techniques/methods appropriate to viruses that are cultured in human or animal cells. Since plant viruses are cultured in plants, there is very little overlap between PLP 6223/4777 and this course. The only overlap is with 2 labs - ELISA and PCR. I don't think that will be a problem - these are standards techniques for virus detection and should be included in any lab class. Detection of viruses in animal cells and plant cells have different challenges so there is even less overlap than there might appear to be.

Department	Name and Title
Food Science and Human Nutrition	Sue Percival, Professor and Chair
Phone Number	**E-mail**
352-392-1991 x202	percival@ufl.edu

Comments

I'm ok with the course.

Department	Name and Title
Phone Number	**E-mail**

Comments

Virology Laboratory
(Course # - TBD) – 1 credit hour

Course Summary: This is an upper division laboratory course covering basic virology assays 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 days activities. Short (5 min) quizzes on this material will be given at the beginning of class.

Laboratory Meeting Times: One day per week - TBD; Time - TBD

Material and Supply Fees: TBD

Instructor: Dr. Melissa Jones
Office: MCB 1148
Phone: 352-392-5923
Email: mmk@ufl.edu

Prerequisites: MCB3020L or MCB3023L

Office hours: Friday from 8-11 AM or by appointment. If an appointment is needed, send an e-mail with three suggested times and Dr. Jones will select a time.

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 get propagated.

Textbook: There is no required textbook for the course

Laboratory Assessment: Each student has the opportunity to earn 1000 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: 70 points (5 points per non-exam class period)
- Quizzes: 120 points (10 points each)
- Lab Write-up: 500 points (125 points each)
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Quizzes: In-lab quizzes given at the beginning of class and will cover the concepts and techniques to be discussed/performed during that lab period.

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Exams: There will be one midterm exam given during the semester and one final exam given during exam week. Each exam will consist of an online/written portion given through Canvas and a practical portion. These exams are mandatory and a review session will be held during the lab period prior to each exam.

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)!

Grading:

A	930 points or above (93% and above)	D+	630-679 (63.9 – 67.9%)
A-	890-939 (89.0 – 93.9%)	D	600-629 (60.0 – 62.9%)
B+	850-889 (85.0 – 88.9%)	D-	570-599 (57.0 – 59.9%)
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Microsoft Software for UF students

http://www.software.ufl.edu

The Office of Information Technology has great news for University of Florida students! If you want to upgrade your operating system or need Microsoft Office Suite, this media will be available in the Spring 2011 semester. The different media available are: Windows 7 operating system Upgrade, Microsoft Office Professional Plus 2010 (32-bit/64-bit) for PC or Microsoft Office for Mac 2011. Software is free for UF students.

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357). Once the media is available, you can get it at the UF Computing Help Desk or at the UF Bookstore .

Other software training opportunities are available. For examples through Lynda.com http://www.lynda.com/member.aspx

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 accommodations 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, https://disability.ufl.edu/

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- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu
- Career Connections Center, First Floor JWRU, 392-1601, https://career.ufl.edu

Student Complaints:
- Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code
- Online Course: http://www.distance.ufl.edu/student-complaint-process

Topic	Date	Discussion	Activities	Assignment Due Dates
Module 1: Introduction to cell culture and virus propagation	Week 1 (Mod. 1a)	● Lab safety and biosafety ● Importance of sterile technique ● Proper use of a biosafety cabinet ● Cell culture basics	● Using a light microscope to visualize cells ● Determining cell culture confluency ● Splitting/passaging cells	
	Week 2 (Mod. 1b)	● Counting cells ● Determining culture concentration ● Adjusting cell culture concentration for experimental use	● Using a hemocytometer to count cells ● Assessing cell viability with trypan blue ● Recognizing cell death ● Calculating cell concentration and adjusting for experimental use	
	Week 3 (Mod. 1c)	● Healthy vs. unhealthy cells ● Basics of viral replication inside host cells ● Cytopathic Effect (CPE)	● Plating cells for experimental use ● Evaluating CPE	
Module 2: Using cell culture to generate viruses and quantification of infectious viruses	Week 4 (Mod. 2a)	● Using cell culture to generate viruses ● Principles of transfection	● Transfection assay	● Module 1 Write-up Due
	Week 5 (Mod. 2b)	● Viral Replication ● ● Quantifying virus using Plaque assay	● Bacteriophage Plaque Assay	
	Week 6 (Mod. 2c)	● Importance of using mock infected and positive control infected cells ● Quantifying virus using $TCID_{50}$ assay	● $TCID_{50}$ assay to quantify virus generated by transfection ● Read Plaque Assay	
	Week 7 (Mod. 2da)	● Determining Multiplicity of Infection (MOI) ● Review cytopathic Effect (CPE)	● Read $TCID_{50}$ plates ● Using $TCID_{50}$ and Plaque assay results to calculate virus concentration	

		● Data analysis and graphing		
	Week 8	Review Session		
	Week 9	Midterm Exam		
Module 3: Detecting viruses using PCR	Week 10 (Mod. 3a)	● Nucleic acid extraction ● Review cytopathic Effect (CPE)	● Nucleic acid extraction	● Module 2 Write-up Due
	Week 11 (Mod. 3b)	● Review of PCR principles ● Using PCR to detect viruses ● Importance of standards and controls	● PCR	
	Week 12 (Mod. 3c)	● Gel electrophoresis	● Gel electrophoresis	
Module 4: Detecting and quantifying viruses using ELISA	Week 13 (Mod. 4a)	● Antibodies for viral detection vs quantification ● Principles of ELISA ● Importance of standard curves and their use	● ELISA set up ● working with antibodies	● Module 3 Write-up Due
	Week 14 (Mod. 4b)	● Analysing ELISA results	● Performing ELISA	
	Week 15	Exam Review		● Module 4 Write-up Due
		Final Exam		