

BIOL302

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

Course Summary

Course : BIOL302 **Title :** Virology

Length of Course : 8

Prerequisites : BIOL 240, BIOL 133 **Credit Hours :** 3

Course Description:

This course will introduce students to the concept of viruses as nonliving parasites that prey upon microbes, plants, and animals. Students will explore various aspects of viruses, including molecular composition and structure, host specificity, viral diseases, and the role of viruses in genomic evolution. The origins and evolution of viruses will be discussed, including how zoonotic viruses such as Zika and COVID-19 gained the new ability to infect humans.

Students that enter this course will build upon existing knowledge in basic biological principles including cell and molecular biology. Familiarity with basic cellular processes such as DNA and RNA replication, and cell division, are assumed.

Course Scope:

This course is intended for students in biological and health science degree programs in which an advanced knowledge of viruses is required. Completion of this course will introduce students to the use of viral vectors as tools in genetic engineering and to understand strategies for treating viral diseases.

Course Objectives:

CO-1: Describe viral structure, life cycle, and replication strategies

CO-2: Explain the major theories for the origin and evolution of viruses

CO-3: Compare and contrast the multiple classification systems for viruses.

CO-4: Describe host immune responses to viral infection, and methods viruses employ to evade immune response

CO-5: Analyze principles of viral pathogenesis

CO-6: Apply virology concepts to viral infectious disease control, prevention, and treatment
CO-7: Summarize the health and economic effects of viruses during history.
CO-8: Explain how genetically engineered viruses have been developed for medical and research purposes

Outline

Week 1: Introduction to Viruses

Learning Objectives:

LO-1 Define how viruses are different from other biological organisms

LO-2 Explain how the development of virology led us to our present understanding of viruses

LO-3 Understand the current theories of how viruses evolved

LO-4 Describe the role of viruses in genomic evolution

Reading(s)

Textbook Chapter 1 *Principles of Molecular Virology*

Article: “*The Central Question in Virology: The Origin and Evolution of Viruses*”

Article: “*The Emerging Field of Human Endogenous Retroviruses: Understanding their Physiological Role and Contribution to Diseases*”

Assignment(s)

Week 1 Introductory Forum Participation, All responses due Sunday

Week 1 Assignment: Are Viruses Alive?, due Sunday

Week 1 Quiz, due Sunday

Week 2: Virus Particles

Learning Objectives:

LO-1 Explain the need for viruses to form outer coats

LO-2 Discuss the role of symmetry in the formation of virus particles

LO-3 Describe examples of different types of virus particles, from simple to more complex forms

Reading(s)

Textbook Chapter 2 *Principles of Molecular Virology*

“*Virus Structure and Classification*” Section 2.2 (pages 20-25)

Assignment(s)

Week 2 Journal Article Summary Assignment, due Sunday

Week 2 Quiz, due Sunday

Week 3: Virus Genomes

Learning Objectives:

LO-1 Describe the range of structures and compositions seen in virus genomes

LO-2 Explain how the composition and structure of a genome affects the genetic mechanisms which operate on it

LO-3 Identify representative examples of virus genomes to illustrate the range of genetic diversity seen in viruses

Reading(s):

Textbook Chapter 3 *Principles of Molecular Virology*

Viral Nucleic Acids by IP O’Carroll and A Rein

Viral Zone Website: <https://viralzone.expasy.org/254>

Assignment(s):

Week 3 Quiz, due Sunday

Week 3 Assignment Viruses and Human Disease Chart, due Sunday

Week 4: Virus Replication

Learning Objectives:

LO-1 Explain the phases of virus replication

LO-2 Describe the key experiments which allowed us to understand what happens during replication

LO-3 Discuss the mechanisms by which cells express the information stored in genes

LO-4 Describe the genome coding strategies of different virus groups

Reading(s)

Textbook Chapter 4 *Principles of Molecular Virology*

Assignment(s)

Week 4 Quiz, due Sunday

Week 4 Assignment Design a Virus, due Sunday

Week 5: DNA Viruses

Learning Objectives:

LO-1 Recognize the diversity and variety of DNA virus types

LO-2 Understand the different mechanisms whereby DNA viruses infect host cells

LO-3 Describe the outcomes (infection, disease, death) cause by DNA virus infection

LO-4 Communicate scientific literature in a presentation, and/or effectively peer-review other's communications

Reading(s)

Textbook Chapter 5 *Principles of Molecular Virology*

Assignment(s)

Assignment 5 Classroom Debate, due Sunday

Peer Reviews (2), due Sunday

Presentation if this is student's assigned week, due Tuesday

Week 6: RNA Viruses, Part 1

Learning Objectives:

LO-1 Recognize the diversity and variety of RNA virus types

LO-2 Understand the different mechanisms whereby RNA viruses infect host cells

LO-3 Describe the outcomes (infection, disease, death) cause by RNA virus infection

LO-4 Communicate scientific literature in a presentation, and/or effectively peer-review other's communications

Reading(s)

Textbook Chapter 6 *Principles of Molecular Virology*

Assignment(s)

Week 6 COVID-19 Case Study, due Sunday

Peer Reviews (2), due Sunday

Presentation if this is student's assigned week, due Tuesday

Week 7: RNA Viruses, Part 2

Learning Objectives:

LO-1 Recognize the diversity and variety of RNA virus types

LO-2 Understand the different mechanisms whereby RNA viruses infect host cells

LO-3 Describe the outcomes (infection, disease, death) cause by RNA virus infection

LO-4 Communicate scientific literature in a presentation, and/or effectively peer-review other's communications

Reading(s)

Textbook Chapter 7 *Principles of Molecular Virology*

Assignment(s)

Week 7 Create a Pamphlet Regarding Virus Outbreak, due Sunday

Peer Reviews (2), due Sunday

Presentation if this is student's assigned week, due Tuesday

Week 8: Reverse Transcriptase, Prions, Bacteriophages, Viroids

Learning Objectives:

LO-1 Recognize the diversity and variety of Reverse Transcriptase (RT) virus types, bacteriophages, and viroids

LO-2 Understand the different mechanisms whereby RT viruses, bacteriophages, and viroids infect host cells

LO-3 Describe the outcomes (infection, disease, death) cause by RT viruses, bacteriophages, and viroids

LO-4 Communicate scientific literature in a presentation, and/or effectively peer-review other's communications

Reading(s)

Textbook Chapter 8 *Principles of Molecular Virology*

Assignment(s)

Week 8 Assignment Virus Vectors, due Sunday

Peer Reviews (2), due Sunday

Presentation if this is student's assigned week, due Tuesday

Evaluation

The total point value for this course is 2000 points which is broken down as follows:

2 discussions: 200 points (100 points each)

4 quizzes: 400 points (100 points each)

8 assignments: 800 points (100 points each)

8 peer reviews: 400 points (50 points each)

1 presentation: 200 points

The breakdown of percentages for this course is broken down as follows:

- Discussions: 10%
- Presentation: 10%
- Quizzes: 20%
- Peer Reviews: 20%
- Assignments: 40%

Materials

Book Title: Principles of Molecular Virology

Author: Alan Cann

Publication Info: Academic Press, Elsevier Publishing Group

ISBN: 978-0-12-801946-7

Article Title: *"The Central Question in Virology: The Origin and Evolution of Viruses"*

Article Title: *“The Emerging Field of Human Endogenous Retroviruses: Understanding their Physiological Role and Contribution to Diseases”*

“Virus Structure and Classification” Section 2.2 (pages 20-25)

Viral Nucleic Acids by IP O’Carroll and A Rein

Viral Zone Website: <https://viralzone.expasy.org/254>

Course Guidelines

Citation and Reference Style

Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

[Tutor.com](https://www.tutor.com) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment. Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days. As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

Course content may vary from the outline to meet the needs of this particular group.

Communicating in the Discussions

Discussions are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the discussion. The purpose of the discussions is to actively participate in an on-going discussion about the assigned content. "Substantive" means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says "I agree" is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.

As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

Identity Verification & Live Proctoring

Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format. Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.

University Policies

[Student Handbook](#)

[Drop/Withdrawal policy](#)

[Extension Requests](#)

[Academic Probation](#)

[Appeals](#)

[Disability Accommodations](#)

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