

BIOL301

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 : BIOL301 **Title :** Molecular Biology

Length of Course : 8

Prerequisites : SCIN211 **Credit Hours :** 3

Description

Course Description: This molecular biology course will provide a detailed understanding of the structure, function, and regulation of DNA, RNA and proteins. The first half of the course will focus on the basic biochemical properties of DNA, RNA and proteins to establish and understanding of how these molecules function. The second half of the course will focus on transcription, translation, and regulation of these processes and finally the real-world application of molecular biology. (Prerequisite: SCIN211)

Course Scope:

This course is an investigation of the molecular structure, function, and regulation of prokaryotic and eukaryotic cells. The goal is to develop an understanding of how living cells carry out functions at the molecular level. With a thoughtful assessment of the molecular basis of cellular functions, these methods are applicable in any field of molecular biology.

Objectives

The successful student will fulfill the following learning objectives:

CO-1 Compare and contrast the structure and function of DNA and RNA

CO-2 Describe proteins, genome organization and DNA replication

CO-3 Define recombinant DNA, molecular cloning, and gene expression

CO-4 Summarize transcription and epigenetic gene regulation

CO-5 Explain RNA processing, post transcriptional gene regulation, and translation

CO-6 Examine GMO's, genome analysis, typing, and medical molecular biology

Outline

Week 1: Student Introductions, Introduction to Molecular Biology, DNA and RNA

Learning Objective(s)

CO-1

Reading(s)

BIOL301 Syllabus

Allison Text:

Chapter 1 (*The Beginnings of Molecular Biology*)

Chapter 2 (*The Structure of DNA*)

Chapter 3 (*The Versatility of RNA*)

Assignment(s)

Week 1 Forum

Week 1 Assignment

Quiz #1: Allison *Chapters 1, 2 and 3.*

Week 2: Protein structure, Genome organization

Learning Objective(s)

CO-2

Reading(s)

Allison Text:

Chapter 4 (*Protein Structure and Folding*)

Chapter 5 (*Genome Organization and Evolution*)

Assignment(s)

Week 2 Forum

Week 2 Assignment

Quiz #2: Allison *Chapters 4 and 5.*

Week 3: DNA replication, DNA repair

Learning Objective(s)

CO-2, CO-3

Reading(s)

Allison Text:

Chapter 6 (*DNA Replication and Telomere Maintenance*)

Chapter 7 (*DNA Repair Pathways*)

Assignment(s)

Week 3 Forum

Week 3 Assignment

Quiz #3: Allison *Chapters 6 and 7*.

Week 4: Recombinant DNA, Analysis of gene expression

Learning Objectives

CO-3

Reading(s)

Allison Text:

Chapter 8 (*Recombinant DNA Technology and Molecular Cloning*)

Chapter 9 (*Tools For Analyzing Gene Expression*)

Assignment(s)

Week 4 Forum

Week 4 Assignment

Quiz #4: Allison *Chapters 8 and 9*

Week 5: Prokaryotic transcription, Eukaryotic transcription

Learning Objective(s)

CO-4

Reading(s)

Allison Text:

Chapter 10 (*Transcription in Bacteria*)

Chapter 11 (*Transcription in Eukaryotes*)

Assignment(s)

Week 5 Assignment

Quiz #5: Allison *Chapters 10 and 11*.

Week 6: Gene regulation, RNA processing

Learning Objective(s)

CO-4, CO-5

Reading(s)

Allison Text:

Chapter 12 (*Epigenetic Mechanisms of Gene Regulation*)

Chapter 13 (*RNA Processing and Post-Transcriptional Gene Regulation*)

Assignment(s)

Week 6 Forum

Week 6 Assignment

Quiz #6: Allison Chapters 12 and 13.

Week 7: Translation, GMO's

Learning Objective(s)

CO-5, CO-6

Reading(s)

Allison Text:

Chapter 14 (*The Mechanism of Translation*)

Chapter 15 (*GMO's Use In Basic and Applied Research*)

Assignment(s)

Week 7 Forum

Week 7 Assignment

Part 1 Final Project

Quiz #7: Allison Chapters 14 and 15.

Week 8: Genomics, Molecular biology in medicine

Learning Objective(s)

CO-6

Reading(s)

Allison Text:

Chapter 16 (*Genome Analysis: DNA typing, Genomics, and Beyond*)

Chapter 17 (*Medical Molecular Biology*)

Assignment(s)

Week 8 Assignment

Final Project

Evaluation

Forum Assignments (8)

There are eight forum assignments in this course. Week 1 is an introduction forum. Subsequent weeks will have topics related to Molecular Biology. Each student is expected to conduct research on the topics, post in the forums, and respond substantively to at least two classmate posts. The initial student forum post should contain a thoughtful and significant analysis of the forum question(s) with scholarly reference sources cited both in-text and a reference list included. The initial post should contain a minimum of 300 words. The initial forum posts are due by Wednesday of each week and responses to classmates are due by the following Sunday of the same week. Your responses to classmate posts should be substantial, ask questions, emphasize key points, and discuss disagreements while maintaining integrity and a show of respect to your fellow classmates. Your classmate responses should contain a minimum of 75 words to sufficiently engage in a rapport.

Online Quizzes (7)

Each of the quizzes will cover the reading material from the Allison textbook. Each quiz will be open book format and non-proctored. You will have 2 hours to take each quiz which will contain 20 questions from the Allison textbook.

Do not click on the quiz until you are ready to take the quiz! You may only access the quiz one time! If you attempt to access the quiz before you are ready to take it and then try to go back and access it again later, you will be locked out of the quiz and will receive a ZERO. Once you begin the quiz, the timer will begin running continuously for the 2 hours; therefore, you have 2 hours from when the timer begins to complete your quiz. The quiz will auto-submit if you go over this limit and record a zero. Be sure not to exceed this limit.

The specific Allison chapters covered for each of the quizzes can be found in the Outline section of this syllabus below and inside the electronic classroom in the weekly Lessons.

Weekly Assignments (8)

Each week you will complete a weekly assignment to submit for grading inside the assignments area of the classroom. The weekly assignment will cover material relevant to the weekly reading in the Allison textbook chapters, the weekly discussion forum, and/or any additional reading or reference material(s) provided for the assignment. The weekly assignments are application-type questions and are designed for you to think critically about the material covered for that week.

Final Project

The final project is due Sunday of Week 8. Specific details for this project can be found inside the electronic classroom. The student is expected to work independently on the final project, perform research preferably using the APUS online library to seek scholarly research articles and carefully cite sources used for this project. This final project will require a significant amount of time and effort and thus comprises 23% of your final course grade.

Please see the [student handbook](#) to reference the University's [grading scale](#). The grade scale can also be directly accessed inside the APUS classrooms under the "Syllabus" link on the menu bar to the left.

Grading:

Name	Grade %
Forums	24.00 %
Forum 1	3.00 %
Forum 2	3.00 %
Forum 3	3.00 %

Forum 4	3.00 %
Forum 5	3.00 %
Forum 6	3.00 %
Forum 7	3.00 %
Forum 8	3.00 %
Quizzes	21.00 %
Quiz 1	3.00 %
Quiz 2	3.00 %
Quiz 3	3.00 %
Quiz 4	3.00 %
Quiz 5	3.00 %
Quiz 6	3.00 %
Quiz 7	3.00 %
Weekly Assignments	32.00 %
Week 1: Assignment 1	4.00 %
Week 2: Assignment 2	4.00 %
Week 3: Assignment 3	4.00 %
Week 4: Assignment 4	4.00 %
Week 5: Assignment 5	4.00 %
Week 6: Assignment 6	4.00 %
Week 7: Assignment 7	4.00 %
Week 8: Assignment 8	4.00 %
Final Project Pt 1	5.00 %
Week 7: Final Project Pt 1	5.00 %
Final Project Pt 2	18.00 %
Week 8: Final Project Pt 2	18.00 %

Materials

Book Title: Fundamental Molecular Biology, 2nd ed - eBook available through the APUS Online Library.

Author: Allison

Publication Info: Wiley Lib

ISBN: 9781118059814

Book Title: To find the library e-book(s) req'd for your course, please visit <http://apus.libguides.com/er.php> to locate the eReserve by course #. You must be logged in to eCampus first to access the links.

Author: No Author Specified

Publication Info:

ISBN: N/A

Required Technology

- See the Technology Requirements section of the undergraduate catalog for the minimum hardware and software requirements.
- Microsoft Office 365 is available to APUS students for free. To sign up, visit

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 on the Forum

- Forums 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 forum. The purpose of the forums 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](#)

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.

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