



North Central State College
MASTER SYLLABUS
2020-2021

- A. Academic Division: Health Sciences
- B. Discipline: Bioscience Technology
- C. Course Number and Title: BIOS2410 Advanced Bioscience Techniques
- D. Course Coordinator: Jason Tucker, M.S.
Assistant Dean: Melinda Roepke, MSN, RN

Instructor Information:

- Name: [Click here to enter text.](#)
- Office Location: [Click here to enter text.](#)
- Office Hours: [Click here to enter text.](#)
- Phone Number: [Click here to enter text.](#)
- E-Mail Address: [Click here to enter text.](#)

- E. Credit Hours: 4
Lecture: 2 hours
Laboratory: 4 hours
- F. Prerequisites: BIOS1010, BIOL1230, BIOL1231c
- G. Syllabus Effective Date: Fall, 2020
- H. Textbook(s) Title:

Molecular Biology of the Gene

- Author(s)/Editor(s): Watson, Baker, Bell, Gann, Levine, Losick/Benjamin Cummings
- Copyright Year: 2013
- Edition: 7th
- ISBN #: 978-0321762436

- I. Workbook(s) and/or Lab Manual: None
- J. Course Description: This course will focus on Molecular Biology and will examine the advanced instruments and methods of analysis used in the laboratory today. The course will include a comprehensive review of advanced bioscience laboratory techniques utilized in the field today to include indications, process, advantages, disadvantages, analytical protocols, and performing specific laboratory techniques. Students will complete a semester long research project using a model organism which will encompass some of the major molecular biology techniques. Students will then write up results in the form of a scientific publication.

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	Weekly written entries in lab journal. End of semester Scientific Paper. Communication – Written VALUE Rubric
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
Define model organisms and explain their importance to scientific research.	Lab Entries-Week 1-2; First interim exam-Week 6; Final exam, End of Semester Research Paper
Describe the types of viruses and their modes of infections.	Lab Entries-Week 3; First interim exam-Week 6; Final exam; End of Semester Research Paper
Describe the major concepts in molecular evolution and its impact on nucleic acid sequences.	Lab Entries-Week 4-5; First interim exam-Week 6; Final exam; End of Semester Research Paper
Demonstrate the use of spectrophotometry in molecular research.	Lab Entries-Week 4-5; Second interim exam-Week 12; Final exam; End of Semester Research Paper
Synthesize the transcription, translation and expression of genes and describe how biotechnology uses these processes to obtain new information.	Lab Entries-Week 7-9; Second interim exam-Week 12; Final exam; End of Semester Research Paper
Demonstrate how recombinant DNA technology can be used to study current research topics.	Lab Entries-Week 10; Second interim exam-Week 12; Final exam; End of Semester Research Paper
Apply the concepts of nucleic acid sequencing to the study of genomics and proteomics.	Lab Entries-Week 11-13; Second interim exam-Week 12; Final exam; End of Semester Research Paper
Apply current research literature, and information related to bioinformatics and relate it to our use in class.	Lab Entries-Week 14-15; Final exam; End of Semester Research Paper

M. Topical Timeline (Subject to Change):

Week	Topical Timeline
1 and 2	<ul style="list-style-type: none"> • Model Organisms • Scientific Literature Review
3	<ul style="list-style-type: none"> • Virology
4 and 5	<ul style="list-style-type: none"> • Molecular Evolution • Nucleic Acids • Biological Database Searches
6	<ul style="list-style-type: none"> • Spectrophotometry

Week	Topical Timeline
7, 8 and 9	<ul style="list-style-type: none"> • Oligonucleotide Primers • Transcription and Reverse Transcription • DNA Replication and Polymerase Chain Reactions • Electrophoresis
10	<ul style="list-style-type: none"> • DNA Transformations
11, 12 and 13	<ul style="list-style-type: none"> • Nucleic Acid Sequencing • Metagenomics and Proteomic Studies • Microsatellites • Gene Expression/ Protein Analysis
14 and 15	<ul style="list-style-type: none"> • Bioinformatics • Phylogenetics

N. Course Assignments:

1. Oral presentations of advanced topics in Bioscience (Week 13)
2. Scientific Write up of semester long Research project (Week 15)
3. Group presentation (Week 8)
4. Weekly lab journal entries (Weekly)
5. Interim exams (Week 6 and 12)
6. Final Exam (Week 16)

O. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70–72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63–66	D	1.00	Below Average
60–62	D-	0.67	Poor
00–59	F	0.00	Failure

P. Grading and Testing Guidelines:

[Click here to enter text.](#)

Q. Examination Policy:

[Click here to enter text.](#)

R. Class Attendance and Homework Make-Up Policy:

[Click here to enter text.](#)

S. Classroom Expectations:

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T. College Procedures/Policies:

Important information regarding College Procedures and Policies can be found on the [syllabus supplement](#) located at

<http://catalog.ncstatecollege.edu/mime/download.pdf?catoid=5&ftype=2&foid=3>