North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Health Sciences

B. Discipline: Bioscience Technology

C. Course Number and Title: BIOS 2530 Genetics

D. Assistant Dean: Heidi Kreglow, PT

E. Credit Hours: 4
Lecture: 3
Laboratory: 3

F. Prerequisites: BIOS 2410
Co-requisite: BIOS 2590c

G. Last Course/Curriculum Revision Date: Spring 2025 Origin date: 02/17/2015

H. Textbook(s) Title:

Essentials of Genetics
- Authors: Klug, Cummings, Spencer, Palladino, & Killian
- Copyright Year: 2020
- Edition: 10th
- ISBN: 9780134898414

I. Workbook(s) and/or Lab Manual:

Title: Genetics Laboratory Investigations
- Authors: Thomas L Mertens, Robert L. Hammersmith
- Copyright Year: 2015
- Edition: 14th
- ISBN: 9780321814173

J. Course Description: During this course we will discuss the principles of genetics with application to the study of biological function at the level of molecules, cells, and multicellular organisms, including humans. The topics include: structure and function of genes, chromosomes and genomes, biological variation resulting from recombination, mutation, and selection, population genetics, use of genetic methods to analyze protein function, gene regulation and inherited disease.

K. College-Wide Learning Outcomes:

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	Research Paper (Week 12). Intercultural Knowledge and Competence VALUE Rubric
Critical Thinking	Homework assignments and Lab reports require assimilating data and drawing conclusions-Weekly. Critical Thinking VALUE Rubric: On Gene Expression, Regulation, and Development Lab Report (Week 6-9)
Information Literacy	
Quantitative Literacy	Lab reports require simple statistics, and graphing Throughout the semester. Quantitative Literacy VALUE Rubric

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
1. Describe and differentiate between the steps of Mitosis and Meiosis.	Lab Reports-Week 1-2; First interim exam-Week 6; Final exam
2. Describe sex determination and the role of sex chromosomes.	Lab Report-Week 3; First interim exam-Week 6; Final exam
3. Synthesize the structure, replication and variation of DNA.	Lab Reports-Week 4-5; First interim exam-Week 6; Final exam
4. Describe gene expression, regulation and development.	Lab reports week 6-9; Second interim exam-week 12; Final exam
5. Illustrate the role of the cell cycle as it applies to cancer.	Second interim exam-week 12; Final exam
6. Demonstrate how recombinant DNA technology can be used to study current genetic topics.	Lab reports week 10-12; Second interim exam-week 12; Final exam
7. Integrate and relate knowledge of modern genetics to real life situations	Lab reports week 13-15; Final exam
8. Apply current research literature, information related to genetic issues in the mass media	Research paper on topics related to materials covered in class-Week10-12.

M. 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

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at
https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Health Sciences	**Discipline:**	Bioscience
Course Coordinator:	Dr. Tony Miller		
Course Number:	BIOS 2530 01	**Course Title:**	Genetics
Semester / Session:	Spring 2026	**Start / End Date:**	1/12/2026-5/8/2026

Instructor Information

Name:	Tony Miller	**Credentials:**	PhD, Ecology & Evolutionary Biology
Phone Number:	419-755-4548	**E-Mail Address:**	jmiller2@ncstatecollege.edu
Office Location:	HS-330	**Office Hours:**	M & W: 8:30-9AM; M: 11:45AM-12:15PM W: 10:55-11:25AM; TH: 8:30-11:30AM

I. Topical Timeline (Subject to Change):

Weeks	Lecture Topic	Lab Topic	Week of: (Monday Date)
1	Introduction to Genetics (CH. 1), Mitosis & Meiosis (CH. 2)	Course Introduction & Syllabus Probability I (Investigation 2)	1/12/26
2	**NO CLASS**	**MLK DAY, NO LAB**	**1/19/26**
3	Mitosis & Meiosis (CH. 2), Mendelian Genetics (CH. 3)	Probability II (Investigation 2) **DUE: 2/2/26**	1/26/26
4	Modification of Mendelian Ratios (CH. 4)	Chi Square I (Investigation 3)	2/2/26
5	Sex Determination & Sex Chromosomes (CH. 5)	Chi Square II (Investigation 3) **DUE: 2/16/26**	2/9/26 *Research Paper Topic Due
6	Chromosome Mutations: Variation in # and Arrangement (CH. 6)	**EXAM I (CHs 1-5)**	**2/16/26**
7	Linkage & Chromosome Mapping in Eukaryotes (CH. 7)	Cell Reproduction: Mitosis (Investigation 4)	2/23/26
8	Genetic Analysis & Mapping in Bacteria (CH. 8)	Meiosis in Animals (Investigation 5) **DUE: 3/16/26**	**3/2/26**
Spring Break (no classes)			**3/9/26**
9	DNA Structure & Analysis (CH. 9)	Fly Lab I	3/16/26
10	DNA Replication (CH. 10)	Fly Lab II **Lab Report Due: 4/20/26**	3/23/26
11	The Genetic Code, Transcription, Translation (CHs 12 & 13)	Polygenic Inheritance (Investigation 22) **DUE: 4/6/26**	3/30/26
12	Gene Mutation, DNA Repair, & Transposition (CH. 14)	**EXAM II (CHs 6-13) SKIP CH. 11**	**4/6/26**
13	Regulation of Gene Expression in Eukaryotes (CH. 16)	Bioinformatics (DNA Subway) **DUE: 4/20/26**	4/13/26
14	Genetics of Cancer (CH. 19)	HNPCC (Carolina) **DUE: 4/27/26**	**4/20/26 **Research Paper & Lab Report Due**
15	Population & Evolutionary Genetics (CH. 21)	Hardy-Weinberg Principle (Investigation 23) **DUE: 5/4/26**	**4/27/26**
16	**CUMULATIVE FINAL on May 4**	**FINAL EXAM (CHs 1-21)**	**5/4/26**

II. Course Assignments:

1. Exams (100 points X 3 = **300 Total Points**)
    a. We will have three exams during weeks 6, 12, & 16
2. Quizzes (25 points X 6 = **150 Total Points**)
    a. Designed to help review the material before the exam. Roughly every 3 weeks.
3. Lab Assignments (30 points X 7 Labs = **210 Total Points**)
    a. Due the week after the lab was conducted.
4. Lab Report (**80 Total Points**)
5. Research Paper (**100 Total Points**)
6. Extra Credit potentially assigned, but not to exceed 15 total points

III. Grading and Testing Guidelines:

Please refer to the Master Syllabus for the NCSC grading scale.

IV. Examination Policy:

1. The reasons for which a student will be excused from taking an examination:
    a. Hospitalization (with documented verification)
    b. Death in the immediate family (with documented verification)
    c. Personal illness or illness in immediate family - (doctor's excuse required).
2. A student who misses an examination for any reason is responsible for contacting the instructor as soon as possible to reschedule the exam.
3. No makeup opportunity will be given for absences where there is not prior communication with the instructor, except in cases of emergency.

V. Class Attendance and Homework Make-Up Policy:

1. Class attendance is necessary to acquire the knowledge required to be successful in the bioscience and biotechnology fields. Absences will be excused with prior communication with the instructor, except in cases of emergencies where the student cannot communicate.
2. Students are responsible for contacting the instructor as soon as possible upon learning they will be absent from class.

VI. Classroom Expectations:

1. Be respectful at all times.
2. Plagiarism and cheating will not be tolerated.
    a. If you are found to be plagiarizing or cheating, you will automatically receive a zero for that assignment.
    b. The instructor reserves the right to escalate offenses of cheating or plagiarism to the dean or appropriate administrator.
        - Offenses could result in dismissal from the college. Be mindful and ask for help if you are unsure if you are plagiarizing or cheating.
3. Communicate regularly with your instructor.
    a. Your instructor is a resource to you. Attend office hours, email your instructor with questions, and participate in class.
    b. Your success in this course will be determined by your level of participation. Life happens. If things are getting in the way of your participation, please inform your instructor so appropriate accommodations can be made.