North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Health Sciences

B. Discipline: Bioscience Technology

C. Course Number and Title: BIOS2550 Pharmaceutical & Toxicology Bioscience

D. Assistant Dean: Heidi Kreglow, PT

E. Credit Hours: 4
Lecture: 2 hours
Laboratory: 4 hours

F. Prerequisites: BIOS2410, CHEM1210
Co-requisite(s): BIOS 2530

G. Last Course/Curriculum Revision Date: Fall 2023 Origin date: 01/13/2016

H. Textbook(s) Title:

Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy

- Author(s): David E. Golan, Ehrin J. Armstrong, April W. Armstrong
- Copyright Year: 2017
- Edition: 4th
- ISBN: 9781451191004

On-line Government Reference Material

I. Workbook(s) and/or Lab Manual: None

J. Course Description: This course is intended to give students an overview of basic Pharmaceutical and Toxicology concepts and methods. The overall organization of the course is grouped into three sections: Part I (Introduction), Part II (Methodologies), and Part III (Analysis). Parts I and II comprise approximately one-half the course and Part III the remaining half. This course is based on lectures, labs, and project assignments, and is to help the student (1) understand the various techniques in biotechnology, their applications in the manufacturing of biopharmaceuticals, and biomedical research; (2) gain knowledge in some of the physicochemical properties, pharmacology and the formulation of commonly used biopharmaceuticals; and (3) understand the principles of the mechanism of some biotechnologically derived diagnostic aids/tests.

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	Written Lab Notebook Entry (Week 8). Written Communication VALUES 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
1. Identify and describe sources of peer review information.	Weekly lab notebook entry. Written homework assignment-Week 1-2; First interim exam-Week 6; Final exam
2. Explain how to evaluate valid information.	Weekly lab notebook entry. Written homework assignment-Week 3; First interim exam-Week 6; Final exam
3. Identify and describe the process of biopharmaceutical drug production.	Weekly lab notebook entry. Written homework assignment-Week 1-2; First interim exam-Week 6; Final exam
4. Identify and describe the process of gene therapy.	Weekly lab notebook entry. Written homework assignment-Week 4; First interim exam-Week 6; Final exam
5. Identify and describe the process of therapeutic effects.	Weekly lab notebook entry. Written homework assignment-Week 5; First interim exam-Week 6; Final exam
6. Identify and describe the process of marketing new drugs.	Weekly lab notebook entry. Written homework assignment-Week 6; Second interim exam-Week 12; Final exam
7. Identify and describe the process of pharmaceutical biotechnology.	Weekly lab notebook entry. Written homework assignment-Week 7; Second interim exam-Week 12; Final exam
8. Identify and describe the process of postmortem forensic toxicology.	Weekly lab notebook entry. Written homework assignment-Week 8; Second interim exam-Week 12; Final exam
9. Identify and describe the process of human performance toxicology.	Weekly lab notebook entry. Written homework assignment-Week 9; Second interim exam-Week 12; Final exam
10. Identify and describe the process of forensic drug testing.	Weekly lab notebook entry. Written homework assignment-Week 10; Second interim exam-Week 12; Final exam
11. Identify and describe the process of specimen preparation.	Weekly lab notebook entry. Written homework assignment-Week 11; Second interim exam-Week 12; Final exam
12. Identify and describe the basic process of spectrophotometry.	Weekly lab notebook entry. Written homework assignment-Week 12; Second interim exam-Week 12; Final exam
13. Identify and describe the basic process of gas chromotography	Weekly lab notebook entry. Written homework assignment-Week 13;Final exam
14. Identify and describe the basic process of immunoassay.	Weekly lab notebook entry. Written homework assignment-Week 14; Final exam
15. Identify and describe the basic process of mass spectrometry.	Weekly lab notebook entry. Written homework assignment-Week 12; Second interim exam-Week 12; Final exam
16. Identify and describe the basic process of methods validation.	Weekly lab notebook entry. Written homework assignment-Week 15; Final exam
17. Identify and describe the basic process of acidic drugs	Weekly lab notebook entry. Written homework assignment-Week 15; Final exam
18. Identify and describe the basic process of basic drugs	Weekly lab notebook entry. Written homework assignment-Week 15; Final exam

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 2550 01	**Course Title:**	Pharmacology & Toxicology
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: (Wednesday Date)
1	Syllabus, Course Introduction	Lab Safety Intro	1/14/26
2	Principles/Mechanisms of Toxicology **Quiz 1 due 1/28/26**	Research Day	1/21/26
3	Drug-Receptor Interactions **Quiz 2 due 2/4/26**	What is Toxicology; LD50 Lab** **DUE: 2/4/26**	1/28/26 ***Research Proposal Due 1/28**
4	Pharmacodynamics	Purification & Size Determination of GFP/BFP Proteins **DUE: 2/11/26**	2/4/26
5	Pharmacokinetics I **Quiz 3 due 2/18/26**	**UNIT I EXAM (Weeks 1-4)**	2/11/26 **LD50 Report Due
6	Pharmacokinetics II **Quiz 4 due 2/25/26**	Analysis of OTC Drugs **DUE: 2/25/26**	2/18/26
7	Drug Metabolism **Quiz 5 due 3/4/26**	ID of Unknown Substance I	2/25/26
8	Case Studies in Pharmacology **Quiz 6 due 3/18/26**	ID of Unknown Substance II** **DUE: 3/18/26**	**3/4/26**
Spring Break (no classes)			**3/11/26**
9	Drug Dependence & Addiction **Quiz 7 due 3/25/26**	Drugs & Poison Analysis **DUE: 3/25/26**	3/18/26
10	Environmental Toxins (Metals)	ELISA **DUE: 4/1/26**	3/25/26 **Unknown Report Due
11	Environmental Toxins (Poisons) **Quiz 8 due 4/8/26**	**UNIT II EXAM (Weeks 5-10)**	**4/1/26**
12	Analytical & Forensic Toxicology **Quiz 9 due 4/15/26**	Fermentation & Bioprocessing of Chromogenic Proteins I	4/8/26
13	Analgesia Pharmacology **Quiz 10 due 4/22/26**	Fermentation & Bioprocessing of Chromogenic Proteins II **DUE: 4/22/26**	4/15/26 ***Research Paper Due 4/16**
14	Cardiovascular Pharmacology **Quiz 11 due 4/29/26**	Caffeine Extraction **DUE: 4/29/26**	**4/22/26**
15	Cancer Pharmacology **Review Quiz 12 due 5/6/26**	TBD **DUE: 5/6/26**	**4/29/26**
16	**CUMULATIVE FINAL on May 6**	**FINAL EXAM (Cumulative)**	**5/6/26**

II. Course Assignments:

1. Exams (100 points X 3 = **300 Total Points**)
    a. We will have five exams during weeks 4, 8, 11, 14, & 16.
2. Lab Reports (100 points X 2 = **200 Total Points**)
    a. Daphnia Lab & Unknown substance Lab
3. Lab Assignments (15 points X 9 Labs = **135 Total Points**)
    a. Due the week after the lab was conducted. (Conducting 1-3 Labs per week)
4. Quizzes (20 points X 11 = **220 Total Points***) *Drop Lowest Quiz
5. Research Paper (**110 Total Points**)
6. Extra Credit potentially assigned, but not to exceed 20 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.