BIOL-230 Anatomy and Physiology w/ Lab

Thomas J. Owen, D.C.
FORT HAYS TECH | NORTH CENTRAL

COURSE INFORMATION

This class is an in-depth study of human anatomy and physiology. Anatomy is the study of the structure of the human body from cell structure through organ systems. Physiology is the study of the mechanical and biochemical functions of the body. To illustrate the concepts discussed in the lecture portion of the class, lectures will be supplemented with laboratory exercises.

Credits: 5

Pre/Corequisites:

- Pre/Corequisite: Grade of C or better in BIOL 121 or qualifying examination score.

CLASS INFORMATION

Section Number: BIOL 230

Term: Fall Year: 2025 Start Date: 8/14/2025 End Date: 12/12/2025

INSTRUCTOR

Thomas J. Owen, DC

Email: towen@fhtechnc.edu

Office Hours: Online Class, please contact by email

TEXTBOOKS

- OpenStax. 2019. Anatomy and Physiology. https://openstax.org/details/books/anatomy-and-physiology
- Online Visible Body Courseware requires $49 year subscription. Join the course: https://courseware.visiblebody.com/courses/126698/join?join_course_token=i3Do1761UdRNb9nk1Zs9kTpY&site_license=false

SUPPLIES

- Computer device with online capabilities
- Notebook Paper
- Colored Pencils/Crayons
- Lab supplies as described in handouts

COURSE COMPETENCIES

1. Use medical terminology appropriately to describe the organizational structure of cells, tissues and organ systems.
2. Identify structures and explain functions of the body systems that provide coverage/support for the body or process nutrients.
3. Identify structures and explain functions of the body systems that process and react to stimuli and permit movement in response.
4. Identify structures and explain functions of the body systems that form blood and its components, permit its circulation and provide immunologic protection.
5. Identify structures and explain functions of the body systems that perform chemically and/or hormonally-mediated respiratory, excretory and reproductive activities.
6. Demonstrate measurable understanding of descriptive anatomical and diectional terminology.
7. Demonstrate measurable understanding of the basic concept of homeostasis and how homeostatic mechanisms apply to body systems.
8. Demonstrate measurable understanding of basic chemistry and cellular structures and function.
9. Demonstrate measruable understanding of the basic tissues of the body, their locations and functions.
10. Demonstrate measurable understanding of major gross and microscopic anatomical components of the integumentary systems and describe the functions of the system.
11. Demonstrate measurable understanding of major gross and microscopic anatomical components of the skeletal system and explain their functional roles in osteogenesis, repair, and body movement.
12. Demonstrate measurable understanding of major gross and microscopic anatomical components of the muscular system and explain their functional roles in body movement, posture maintenance, and heat production.
13. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the nervous system and explain their functional roles in communication, control, and integration.
14. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the eye and ear, and explain their functional roles in vision, hearing, and equilibrium. Students should also be able to identify and locate the receptors responsible for olfaction and gustation, and briefly describe the physiology of smell and taste.
15. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the endocrine system and explain the functional roles of their respective hormones in communication, control, and integration.
16. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the cardiovascular system, and explain their functional roles in transport and hemodynamics.
17. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the lymphatic system, and explain their functional role in fluid dynamics and immunity.
18. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the respiratory system, and explain their functional roles in breathing/respiration and in the process of external and internal respiration.
19. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the digestive system and explain their functional roles in digestion, absorption, excretion, and elimination.
20. Demonstrate measurable understanding of the functional relationship among cellular, tissue, and organ level metabolism, the role nutrition plays in metabolism, and the mechanisms by which metabolic rate is regulated in the body.
21. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the urinary system, and explain their functional roles.
22. Demonstrate measurable understanding of the physiology of the homeostatic mechanisms that control fluid/electrolyte and acid/base balance.
23. Demonstrate measurable understanding of the major gross and microscopic anatomical components of the reproductive system and explain their functional roles in reproduction and inheritance.

GRADING INFORMATION

Grading

- Labs (15 pts each) will involve hands-on experiments collecting empirical data. Grades earned during labs will be based on submission of written work as well as participation.
- Quizzes (20 pts each) will be given following each topic covered. Quizzes will often be a mixture of practical and non-practical style questions, and include concepts covered during both lecture and lab days for a given topic.
- Unit Exams (each worth 30 pts each) will be given during the semester. Exams will include material covered during both lectures and labs. A final exam over the last unit and cumulative material from previous chapters will be given at the end of the semester. There may be questions relating to the broader implications of what has been learned in class to real-world scenarios.
- 300 pts (approx) will be designated for participation in the Visible Body Courseware activities.

Labs (All Labs Required)	15 labs x 15 pts per lab	225 pts
Quizzes	15 quizzes x 15 pts per quiz	225 pts
Unit Quiz	4 quizzes x 30 pts per	120 pts
Visible Body Courseware	15 Chapters	300 pts
Final Exam	1 Final Exam	150 pts
Total points possible for the course: approx 1,020 pts		

GRADING SCALE

After your numerical grade has been calculated, your letter grade will be determined as follows:

A 100% -90%
B 89% - 80%
C 79% - 70%
D 69% - 60%
F 59% and below

Classroom Policies

Respect

Topics discussed in class are expected to be approached by the instructor and students scientifically in an unbiased and non-judgmental manner. Therefore, it is expected that respect will be given to everyone in the classroom regardless of their background or opinions on an issue.

Plagiarism and Cheating

Plagiarism and cheating are considered unacceptable. Therefore, either of these actions will result in an automatic zero on the assignment. Use of generative AI (or other similar tools or software) is not permitted in this class for any assignments. This course assumes that work submitted by students – all papers, discussion boards, and case studies – will be generated by the students themselves. Use of AI tools in this course is considered a violation of Fort Hays Tech | North Central's Academic Honesty Policy. Violations will result in failure of the assignment or failure of the course.

Late Work

Work is expected to be turned in on time. Therefore, no late work will be accepted.

Quiz/Exam Make Up

Make-up quiz/exams will be given at the discretion of the instructor. Personal travel/vacations, work, etc. are not permissible reasons for make-up quiz/exams. This version of the quiz/exam will be more rigorous than the quiz/exam given during the assigned period to the rest of the class, may differ in format and will be worth 75% of the points. If the exam has already started when the student arrives to class, 25 points will be deducted from the final grade of the quiz/exam.

Participation

Participation means being active in class discussions, activities, labs, etc. If a student misses a laboratory during assigned class time, the student will not be able to make up the lab or turn in any assignments associated with the lab that was missed. Therefore, missing class will result in a zero on labs that was given during the student's absence. Due to this policy, your lowest score on a lab will be dropped at the end of the semester. To acquire a passing grade in the course, participation is mandatory, and all assignments must be turned in.

Electronics

Many activities will require the use technology in the classroom. However, cell phones are discouraged from being used during class time unless designated by the instructor. If a cell phone is being used at an undesignated time, the instructor reserves the right to confiscate the cell phone until the end of the class period upon which time it will be returned to the student. Laptops may be used for class work but if being used to shop, play games, use social media, etc. the student will be asked to put them away.

Recording

When students record something that happens in a course (a lecture, class discussions, meetings, etc.) it has an impact on the rights of the people captured in that recording. For example, the instructor and the College may have rights to the intellectual property contained in that recording. At the same time, another student who may have been recorded has the right to privacy. In this class, students **may not** make audio or video recordings of course activity.

Time Commitment

A course is measured in credit hours. Each credit hour requires about 45 hours of work.

ACADEMIC HONESTY

Membership in the Fort Hays Tech | North Central learning community imposes upon the student a variety of commitments, obligations, and responsibilities. It is the policy of this College to impose sanctions on students who misrepresent their academic work. Appropriate classroom instructors or other designated persons will select these sanctions consistent with the seriousness of the violation and related considerations.

Examples of academic dishonesty include but are not limited to:

- Plagiarism: i.e. taking someone else's intellectual work and presenting it as one's own. Each department set standards of attribution. Faculty will include disciplinary or class-specific definitions in course syllabi.
- Cheating is unacceptable in any form. Examples include consultation of books, library materials, notes or intentional observation of another student's test on paper or a computer screen; accessing another student's answers from an exam to be given or in progress; submission of falsified data; alteration of exams or other academic exercises; and collaboration on projects where collaboration is forbidden.
- Falsification, forgery or alteration of any documents pertaining to assignments and examinations.
- The use of AI generated content from AI tools such as, but not limited to, ChatGPT, Dall-E, Co-Pilot, etc., is up to faculty discretion per course as stipulated within the course syllabus. Submitting AI generated work as your own, without attribution, will be considered academic dishonesty.
- In courses where the use of AI tools are not permitted as stipulated within the course syllabus, work submitted using AI will be considered academic dishonesty.
- Students who participate in, or assist with, cheating or plagiarism will also be in violation of this policy.

Classroom instructors and/or administrators will assess sanctions for violations of this policy. The seriousness of the violation will dictate the severity of the sanction imposed. Academic sanctions may include but are not limited to any of the following:

1. verbal or written warning
2. lowering of grade for an assignment
3. lowering of term grade

Administrative sanctions may include but are not limited to either of the following

1. Suspension from the course, program, or College
2. Dismissal from the course, program, or College

FORT HAYS TECH | NORTH CENTRAL MISSION STATEMENT

Fort Hays Tech | North Central delivers applied, innovative and personalized education to empower learners, enrich lives, develop skilled professionals and strengthen economic systems.

Vision Statement

Fort Hays Tech | North Central is dedicated to being a leader in workforce development by maximizing value for students, employers and communities through educational excellence.

Core Values

FORT HAYS TECH | NORTH CENTRAL NON-DISCRIMINATION POLICY

Fort Hays Tech | North Central is committed to nondiscrimination on the basis of race, color, gender, ethnic or national origin, sex, sexual orientation, gender identity, marital status, religion, age, ancestry, disability, military status, or veteran status in admission or access to, or treatment or employment in, its programs and activities. Further, it is the policy of the college to prohibit harassment (including sexual harassment and sexual violence) of students and employees. Any person having inquiries concerning the college's compliance with the regulations implementing Title VI, Title VII, Title IX, Section 504, and the Americans with Disabilities Act Amendments Act is directed to the VP of Student and Instructional Services (Section 504/ADA Compliance Officer and Title VI, Title VII, & Title IX Compliance Officer) at (785)738-9055, cisbell@ncktc.edu, or PO Box 507, 3033 US Hwy 24, Beloit, KS 67420.

FORT HAYS TECH | NORTH CENTRAL TOBACCO USE POLICY

The use of tobacco products in any form and/or electronic cigarettes is prohibited in, or within ten (10) feet of any building owned, leased, or rented by the College.

FORT HAYS TECH | NORTH CENTRAL WEAPONS POLICY

Fort Hays Tech | North Central prohibits the possession and use of firearms, explosives, and other weapons on Fort Hays Tech | North Central property, with certain limited exceptions, as provided below. This policy is in accordance with the Kansas Board of Regents ("Board") Policy and state law, K.S.A. 75-7c01, et seq. Definitions For purposes of this policy:

1. The term "weapons" includes:
    a. Any object or device which will, is designed to, or may be readily converted to expel bullet, shot or shell by the action of an explosive or other propellant;
    b. Any handgun, pistol, revolver, rifle, shotgun, or other firearm of any nature
    c. Any BB gun, pellet gun, air/CO2 gun, stun gun or blowgun;
    d. Any explosive, incendiary or poison gas (A) bomb, (B) mine, (C) grenade, (D) rocket having a propellant charge of more than ¼ ounce;
    e. Any incendiary or explosive material, liquid, solid, or mixture equipped with a fuse, wick or other detonating device;
    f. Any tear gas bomb or smoke bomb; however, personal self-defense items containing mace or pepper spray shall not be deemed to be a weapon for the purposes of this policy;
    g. Any knife, commonly referred to as a switch-blade, which has a blade that opens automatically by hand pressure applied to a button, spring or other device .

INCLEMENT WEATHER

College campus dismissals and cancelations will be announced using the College Alert system. Local media will also be notified.

OVERVIEW FOR STUDENTS WITH DISABILITIES

Fort Hays Tech | North Central is dedicated to providing equal access and opportunity to all campus programs and services for students with disabilities. We are committed to providing reasonable accommodations in accordance with applicable state and federal laws including, but not limited to, Section 504 and 508 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. We strive to create a safe, respectful and inclusive environment and promote awareness, knowledge and self-advocacy.

Fort Hays Tech | North Central acknowledges that traditional methods, programs and services are not always appropriate or sufficient to accommodate the limitations experienced by some qualified persons with disabilities. When a student's disability prevents him/her from fulfilling a course requirement through conventional procedures, consideration will be given to alternatives, **keeping in mind that academic standards must be maintained**.

Services are provided through Student Accessibility Services (SAS) staff located in the Student Success Center, on the Beloit Campus, and in Student Services, on the Hays Campus.

- Director of Learning Services, may be reached at 1-785-738-9020; or by mail at Fort Hays Tech | North Central, 3033 US Hwy 24, Beloit, KS 67420.

Student Responsibilities

Students requesting support services will need to register ("self-disclose" and complete Student Accessibility Services Intake and Consent Form), provide appropriate documentation (if available) including how the disability affects academic performance and suggested accommodations, and communicate with the Director of Learning Services as part of the interactive process to create an *Educational Accommodation Plan* that will notify Instructors of approved accommodations, services and/or auxiliary aids.

Students are encouraged to make timely and appropriate disclosures and requests, at least two weeks in advance of a course, program, or activity for which an accommodation is requested (or as soon as realistically possible) to allow adequate time for accommodation services to be set in place.

Accommodations, Academic Support Services, or Auxiliary Aids

Reasonable accommodations including academic support services and auxiliary aids are provided to allow students with disabilities an equal opportunity to participate in and benefit from our educational programs. Accommodations will be provided on a case-by-case basis determined by student request, documentation, intake interview, Educational Accommodation Plan team, and assessment of individual needs and course requirements.

Reasonable testing accommodations may include, but are not limited to:

- Extended testing time
- Reduced distraction testing environment
- Test reader and/or scribe
- Use of calculator

Academic support services/auxiliary aids may include, but are not limited to:

- Note-taking assistance (second set of notes, power point slides, or other visual aids provided)
- Sign Language Interpreter
- Preferential seating in the classroom
- Large print exams, handouts, signs, etc.
- Telecommunications devices
- Use of Assistive Technology

Accommodations may not fundamentally alter the nature of the program or activity, lower academic standards, present undue financial or administrative burden on the college, or post a threat to others or public safety.

Additionally, some accommodations and services cannot be provided, such as personal devices or assistance with personal services.

Auxiliary aids may be available through a variety of sources available to individual students. The student may make a request in obtaining specialized support services from other resources such as Vocational Rehabilitation Services (VR), Recordings for the Blind, Kansas Talking Book Service, etc. For example, Vocational Rehabilitation may fund such items as transportation to the institution, tuition, textbooks, hearing aids, and other individually prescribed medical devices.

If at any time throughout the academic year, a student feels that the agreed upon accommodations are not being followed or that alternate accommodations need to be provided, the student should notify Student Accessibility Services (SAS) staff. Fort Hays Tech | North Central is committed to student success; however, we do not require students to use accommodations. The decision of when to utilize approved accommodations or services is up to the student. Integration, self-advocacy and individual responsibility are promoted and expected.

Grievance Procedure

Any student who believes he or she has been subjected to discrimination on the basis of disability or has been denied access or accommodations, shall have the right to invoke the Grievance Procedure.

Students are encouraged to first discuss their concerns with SAS. An attempt will be made to resolve the issue(s) causing concern by assisting the student in discussions with the person(s) involved. Most situations are positively resolved through this process. If the student does not feel the concern or complaint has been appropriately resolved, he or she should contact the Vice President of Student and Instructional Services at 1-800-658-4655 or PO Box 507, 3033 US Hwy 24, Beloit, KS 67420, where grievance procedures are filed for all students, including students with disabilities.

If the complaint is not resolved at the College level, a student may choose to file a complaint with the Office for Civil Rights at 1-816-268-0550 or U.S. Department of Education, One Petticoat Lane, 1010 Walnut Street, Suite 320, Kansas City, MO 64106.

Confidentiality

All information regarding a student's disability is confidential. All documentation will remain separate from academic records and will not be released to an individual or source external to Fort Hays Tech | North Central without the student's written consent. In order to provide effective services, it may be necessary to communicate limited information on a need-to-know basis regarding disability-related needs to Fort Hays Tech | North Central faculty and/or staff.

REASONABLE SUSPICION

If reasonable suspicion of substance abuse exists regarding an employee or student based on objective criteria (including, but not limited to, behavior, appearance, demeanor, detection of the odor of alcohol or any controlled

substance), the employee or student will be requested to consent to drug testing performed by Fort Hays Tech | North Central's contract vendor at the expense of the college.

A. A college administrator (or their designee) shall drive the employee or student to the vendor's site for drug testing and shall return the employee or student to his/her residence (or arrange for transportation) following the testing.

B. Test results shall be sent directly to the college administrator, with a copy also sent to the employee or student. All test results will be considered confidential, access to the results will be limited to institutional personnel who have a legitimate need-to-know.

C. In the event of a positive test result, the employee or student may request a retest of the sample at the employee or student's expense. The request must be submitted within 24 hours.

D. Positive results for any illegal drugs, or prescription drugs (either not prescribed for the employee or student, or at levels above the prescribed dosage), or blood alcohol level of 0.04 or greater shall be grounds for disciplinary action, up to and including termination or expulsion.

E. Refusal to provide a specimen for this testing shall be treated as a positive drug test result.

F. Test results or specimens that have been determined to be altered by the employee or student shall be grounds for disciplinary action, up to and including termination or expulsion.

G. If the employee or student tests positive for an authorized prescription drug which may impair his/her performance or judgment, the employee or student may not be permitted to participate in college activities until he/she provides a doctor's release.

RIGHT TO MODIFY THE SYLLABUS

The instructor reserves the right to modify the syllabus during the semester. Students will be given advanced notice if a change would occur.

TENTATIVE COURSE SCHEDULE

Anatomy and Physiology Tentative Schedule. With Summer 25 class we will be combing 2 chapters a week. Items italicized indicate holidays or NCK-Tech related events

- Note this is a tentative schedule; therefore, this outline is subject to change and students will be notified

Week	Week of	Topic	Notable Assessments
1		Introduction to Human Anatomy and Physiology	
2		Cells	
3		Tissues	
4		Skin and the Integumentary System	
5		Skeletal System	Unit 1 Quiz. Weeks 1-4
6		Muscular System	

7		Nervous System	
8		Endocrine System	
9		Cardiovascular System	Unit 2 Quiz Weeks 5-8
10		Lymphatic System and Immunity	
11		Respiratory System	
12		Digestion	Unit 3 Quiz Weeks 9-11
13		Urinary System	
14		Reproductive Systems	
15		Pregnancy, Growth, and Development	Unit 4 Quiz Weeks 12-15
16		*Final Exam*	End of Semester