Syllabus

BSC 1005, Introduction to Biology

Summer 2025

- Professor: Pat McArthur, Ph.D.
- Office Hours:
  - Monday thru Thursday 8:00am -5:00pm: Friday 8:00am -12:00pm
- Phone No.:
  - 850-729-5241
- Email:
  - mcarthup@nwfsc.edu
- Final Exam: Due by August 7th
- Reference Numbers: 30350
- Campus/Room: Rm. 113 Science Bldg. (Bldg. 350) Niceville Campus (when in session)
- Class Days: Online
- Class Times: Online

Course Description

This course is designed as an introduction to the basic principles of all living structures and will build the foundational principles needed for biological sciences. A study of the basic principles and foundations of biology with specific emphasis on the human model. Specific attention and detail will be given to the molecular mechanisms that share commonality with all systems. Material will range from organizational levels through conceptual understanding of bioengineering covering design through molecular interactions responsible for specific function. Particular attention will be focused on the topics of anatomical and physiological themes involving the chemical, cellular, and tissue level of organization, bioenergetics, cell division and growth, genetic inheritance, skeletal, digestive, cardiovascular, musculosketeal, and endocrine systems, ending with origins of life.

Course Prerequisite(s)

There are no prerequisites for this course.

Course Materials

Text: https://openstax.org/details/books/concepts-biology

Grading Procedures

Examinations and Grading Scale:

Lecture examinations will contain a combination of multiple choice, short answer and experimental, hypothetical, or applied essay questions, with multiple parts. Questions will be drawn from the material covered since the previous exam, and each exam will carry equal weight (see Course Schedule, below). According to Bloom's Taxonomy of Learning there are 6 levels of learning with the highest two levels being the synthesis and evaluative stages. This class is aimed at all levels with particular attention to the synthesis and evaluative stages. My goal in preparing examinations is to test your **understanding** of important concepts, and your **ability to reason logically (analytical and evaluative reasoning)** from things, which you have (or should have) learned. I am not particularly interested in answers to exam questions, which merely demonstrate **rote memorization of facts**, and I am certainly not interested in answers containing material, which does not **specifically** address the question. Of course, no understanding or reasoning can occur in the absence of factual information, but it is always evident that important facts are retained when understanding of a subject is genuine. The following is an example of an array of typical exam questions based on Bloom's Taxonomy:

Enzymes:

1. Are catalysts that change the equilibrium constant of a reaction.
2. Are catalysts that lower the energy of activation of the reaction.
3. Are catalysts that only work at neutral pH.

4. Are catalysts that are made primarily from RNA.

Briefly describe how enzymes lower the energy of activation of a reaction by describing the 4 characteristics of enzymes discussed in class.

What are the implications of enzymes in the process of digestive compartmentalization?

Examinations must be taken at the scheduled time, although exceptions for missed exams may be granted in unavoidable emergencies (see Attendance Policies, below) make up lecture exams will be administered at the Academic Success Center and must be completed within 72 hrs of the original test date. Final grades will be determined from a distribution of the total scores achieved by each student during the semester, as follows: (this scheme will be slightly altered when appropriate grouping of scores and good judgment make this logical)

Total scores at 90% but < of the top total score.....A

Total scores at 80% but < 90% of the top total score.....B

Total scores at 70% but < 80% of the top total score.....C

Total scores at 60% but < 70% of the top total score.....D

Total scores < 60% of the top total score.....F.

There will be two lecture exams during the semester worth 200 points each. The maximum possible score will be 400 points (see Course Schedule, below). There will also be one research paper and presentation due worth 200 points, 100 points each. The lecture, research paper and presentation points will be added together for your total score out of a possible 600 points.

Grades are earned by demonstrating subject mastery over the material as evaluated by the testing procedures and your ability at written expression and **cannot** be improved by attendance, attitude, or any other outside variable(s). **There is no extra credit (no exceptions).** The final grade reflects extensive deliberation and analysis, and the grades thus assigned represent decisions, which are final. As a result of this policy, please understand that requests to modify the grade scale **will not** be approved. Grades can be viewed through your on-line account at midterm and after finals only, and will not be e-mailed early under any circumstances.

Incomplete Grades

At the discretion of the instructor, an incomplete grade ("I") may be awarded when the student is unable to finish the required work because of unforeseen extenuating circumstances such as illness or TDY assignment. To receive an "I" grade, the student must have successfully completed a significant portion of the required coursework and be able to finish the remaining work without attending class. An "I" grade will automatically convert to a grade of "F" if the student does not complete the remainder of the coursework by the established deadline.

Email

Email is the official communication medium of the College. Please check your email regularly for any class and College notifications.

Desire 2 Learn

Like all NWF State College classes, this class uses Blackboard, a platform for online learning. You can access this class's Blackboard site through RaiderNet. You will find the class syllabus and other resources. The syllabus and your grades can be found in Blackboard.

Cell Phone/Electronic Devices

Cell phones, pagers, and other such electronic devices must not distract from learning. Courtesy to the professor and other students requires that phones be on vibrate or silent mode during class. No student should initiate conversations, including texts, during class activities. Use of electronic communication devices during examinations or other graded activities may constitute grounds for disciplinary action; such devices must be completely out of sight during exams or other assessments. Where emergency or employment situations *require* access to electronic communication services, arrangements may be made *in advance* with the instructor.

Emergency College Closure

In the event of unusual or extraordinary circumstances, the schedule, requirements, and procedures in this course are subject to change. If the college closes for inclement weather or other emergency, any exams, presentations, or assignments previously scheduled during the closure period will automatically be rescheduled for the first regular class meeting held once the college re-opens. If changes to graded activities are required, students will not be penalized as a result of the adjustments, but will be responsible for meeting revised deadlines and course requirements.

Children in the Classroom

As a courtesy to other students and the learning process, students may not bring children with them to class sessions. Health and safety concerns prohibit children from accompanying adult students in any lab, shop, office, or classroom or other college facility where potential hazards exist. If a child-related emergency means you must miss class, contact the instructor as soon as possible to determine your options. (The full "Children on Campus" policy statement appears in the College Catalog.)

Student Rights, Responsibilities, and Academic Integrity

Students are responsible for adherence to all college policies and procedures, including those related to academic freedom, cheating, classroom conduct, computer/network/e-mail use and other items included in the *Northwest Florida State College Catalog and Student Handbook.* Students should be familiar with the rights and responsibilities detailed in the current *Northwest Florida State College Catalog and Student Handbook.* Plagiarism, cheating, or any other form of academic dishonesty is a serious breach of student responsibilities and may trigger consequences which range from a failing grade to formal disciplinary action.

Changes to Policies

Any and all policies described here are subject to change by the instructor. Such changes will be announced by the instructor in class.

RESOURCES

The Academic Success Center (ASC)

The Academic Success Center (ASC) is located in the Activities Center (Building 410) on the Niceville Campus. The ASC provides free learning support services such as tutoring, ESOL, and writing assistance for all NWF State College students. Individual and group tutoring is available in a wide range of subjects on a walk-in-basis and by appointment. For more information, call the Academic Success Center at (850) 729-5389 or visit our website at Free Tutoring.

Smarthinking

Smarthinking is an online, real-time tutoring offered free to students, who may access this service via Blackboard.

Open Computer Labs

There are numerous open computer labs throughout the NWF State College campuses. Students may access our website for lab locations and hours: Computer lab location and hours

Testing Center

Testing Centers administer college admissions tests, placement tests, proctored exams, ACT/SAT, GED, CLEP, and DSST (formerly known as DANTES). Make-up exams may be taken in the Testing Center, depending upon instructor policies on late work. General test information concerning tests, testing center locations, and hours may be accessed on the Testing Center website at Testing Center.

Library, Online Reference Materials, and Resources

The library is a comprehensive, learning resource center providing information in print, digital, and multimedia formats to support the educational objectives of the College. In addition to in-house materials, online services and resources can be accessed through the Learning Resource Center website. Library hours are posted each semester at the building entrance and on the LRC website at Learning Resource Center

Assistance for Military and Veterans

Northwest Florida State College supports our military and veterans students. You may contact NWF State College Hurlburt Center Educational Services Building at 850-200-4190 or visit our website at Support Our Military

Students with Disabilities

Northwest Florida State College supports an inclusive learning environment for all students. If you have disabilities for which accommodations may be appropriate to assist you in this class, please contact the Office of Disability Support Services on the Niceville Campus, or call 850-729-6079 (TDD 1-800-955-8771 or Voice 1-800-955-8770.

Appendix: Tentative Schedule, subject to change by notice in class from instructors

Course Objectives:

At the conclusion of this course the student will be able to:

1. Identify, define and discuss the interrelationships between chemical, cellular, and molecular mechanisms that share commonality with all systems.
2. Identify, define and discuss the interrelationships between the cell doctrine theory, system organization, and homeostasis.
3. Identify, define and discuss the interrelationships between bioenergetics between all living systems.
4. Identify, define and discuss the interrelationships among living systems in regards to cell division and growth.
5. Identify, define and discuss the cellular form and function, specifically as it relates to genetic controls.
6. Identify, define and discuss the anatomical and physiological functions of the digestive system
7. Identify, define and discuss the anatomical and physiological functions of the cardiovascular system
8. Identify, define and discuss the anatomical structure and physiological function of the musculoskeletal system.
10. Identify, define and discuss the anatomical structure and physiological function of the endocrine system
11. Identify, define and discuss the theories for the origin of life.

Lecture Course Schedule:

WEEK	TENTATIVE EXAM DATES	LECTURE TOPIC/TEXT ASSIGNMENT
1		Introduction- History
2	Biology Paper topic Due	Macromolecules and Chemistry: Molecular logic of life
3		Macromolecules and Chemistry: pH
4		Homeostasis
5	Lecture Exam # 1	
6		Osmosis and Diffusion
7		Osmosis and Diffusion
8		Electricity and nerve conduction
9		Electricity and nerve conduction
10		Energy
11	Lecture Exam # 2	
12	Biology Paper Due	Finals Week

Caveat-"Disclaimer"

The schedule, requirements, and procedures in this course are subject to change in the event of unusual or extenuating circumstances; in such cases, the students will be provided with written notice sufficient to plan for and accommodate the changes. If the College closes for inclement weather or other emergency, the date for any exams, presentations, projects, or papers due during the closure period will be postponed. A revised schedule will be available at the first regular meeting held once the College re-opens.

APPENDIX - A

A SELECTED BIBLIOGRAPHY

Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K., and Watson, J. (1994). Molecular biology of the cell (3rd ed.). New York, NY: Garland Publishing, Inc.

Anderson, S., & Cockayne, S. (1993). Clinical chemistry: Concepts and applications. Philadelphia, PA: W.B. Saunders Company.

Berne, R., & Levy, M. (1992) Cardiovascular physiology (6th ed.). St. Louis, MO: Mosby.

Brooks, G. A., Fahey, T.D., & White, T.P. (1996). Exercise physiology: Human bioenergetics and its applications (2nd ed.). Mountain View, CA: Mayfield Publishing Company.

Burtis, C., & Ashwood, E., (1996). Tietz fundamentals of clinical chemistry (4th ed.). Philadelphia, PA: W.B. Saunders Company.

Cambell, M. (1995). Biochemistry (2nd ed.). Philadelphia, PA: W.B. Saunders Company.

Cambell, N. (1996). Biology (4th ed.). Menlo Park, CA: The Benjamin/Cummings Publishing Company, Inc.

Chung, E. (1983). Exercise electrocardiography: Practical approach (2nd ed.). Baltimore, MD: Williams& Wilkins.

Devlin, T. (1992). Textbook of biochemistry (3rd ed.). New York, NY: Wiley-Liss Publication.

Fardy, P., & Yanowitz, F. (1995). Cardiac rehabilitation, adult fitness, and exercise testing (3rd ed.). Baltimore MD: Williams & Wilkins.

Fersht, A. (1997). Enzyme structure and mechanism (2nd ed.). New York, NY: W.H. Freeman and Company.

Foss, M.L. & Keteyian, S.J. (1998). Fox=s physiological basis for exercise and sport (6th ed.). Boston, MA: WCB McGraw-Hill.

Golberger, A., & Golberger, E. (1994). Clinical electrocardiography: A simplified approach (5th ed.). St. Louis, MO: Mosby.

Golberger, E. (1974). Treatment of cardiac emergencies. St. Louis, MO: C.V. Mosby Company.

Gray, H. (1977). Gray=s anatomy: Anatomy, descriptive and surgical. New York, NY: Grammercy Books.

Guyton, A.C., & Hall, J.E. (1997). Human physiology and mechanisms of disease (6th ed.). Philadelphia, PA: W.B. Saunders Company.

Guyton, A.C., & Hall, J.E. (1996). Textbook of medical physiology (9th ed.). Philadelphia, PA: W.B. Saunders Company.

Junqueira, C.L., Carneiro, J., and Kelly, R.O. (1995). Basic histology (8th ed.). Stamford, CT: Appleton & Lange.

Kent, G. (1978). Comparative anatomy of the vertebrates (4th ed.). St. Louis, MO: The C.V. Mosby Company.

Lamb, J.F., Ingram, C.G., Johnston, I.A., & Pitman, R.M. (1991). Essentials of physiology (3rd ed.). Osney Mead, Oxford: Blackwell Scientific Publications.

Lilly, L. (1998). Pathophysiology of heart disease (2nd ed.). Baltimore, MD: Williams & Wilkins.

Little, R., & Little, W. (1989). Physiology of the heart and circulation (4th ed.). Chicago, IL: Year Book Medical Publishers, Inc.

Lodish, H., Baltimore, D. Berk, A., Zipursky, S.L., Matsudaira, P., & Darnell, J. (1995). Molecular cell biology (3rd ed.). New York, NY: W.H. Freeman and Company.

McClintic R.J. (1985). Physiology of the human body (3rd ed.). New York, NY: John Wiley & Sons.

McGilvery, R. (1983). Biochemistry: A functional approach (3rd ed.). Philadelphia, PA: W.B. Saunders Company.

Moore, K. (1992). Clinically oriented anatomy (3rd ed.). Baltimore, MD: Williams & Wilkins.

Podrid, P., & Kowey, P. Eds. (1996). Handbook of cardiac arrhythmia. Baltimore, MD: Williams & Wilkins.

Powers, S.K., & Howley, E.T. (1994). Exercise physiology: Theory and applications to fitness and performance (2nd ed.). Madison, WI: WCB Brown & Benchmark, Publishers.

Randall, D., Burggren, W., & French, K. (1997). Eckert animal physiology: Mechanisms and adaptions (4th ed.). New York, NY: W.H. Freeman and Company.

Robyt, J., & White, B. (1990). Biochemical techniques: Theory and practice. Prospect Heights, IL: Waveland Press, Inc.

Ross, M.H., Romrell, L.J., and Kaye, G.I. (1995). Histology: A text and atlas (3rd ed.). Baltimore, MD: Williams & Wilkins.

Schmidt-Nielsen, N. (1997). Animal physiology: Adaptation and environment (5th ed.). Cambridge, United Kingdom: Cambridge University Press.

Scopes, R. (1994). Protein purification: Principles and practice (3rd ed.). New York, NY: Springer-Verlag.

Smith, J., & Kampie, J. (1990). Circulatory physiology: The essentials (3rd ed.). Baltimore, MD: Williams & Wilkins.

Stryer, L. (1981). Biochemistry (2nd ed.). New York, NY: W.H. Freeman and Company.

Thibodeau, G. (1987). Anatomy and physiology. St. Louis, MO: Times Mirror/Mosby College Publishing.

Tortora, G. (1989). Principles of human anatomy (5th ed.). New York, NY: Harper & Row, Publishers.

Van Wynsberghe, D., Noback, C., and Carola, R. (1995). Human anatomy & physiology (3rd ed.). New York, NY: McGraw-Hill, Inc.

Voet, D. & Voet, J. (1995). Biochemistry (2nd ed.). New York, NY: John Wiley & Sons, Inc.

Wood, W., Wilson, J., Benbow, R., & Hood, L. (1974). Biochemistry: A problems approach. Menlo Park, CA: W.A. Benjamin, Inc.