Course Syllabus: Life I – Molecular & Cellular Concepts
BIOL 1114-201
Spring 2021
TR 11:00-12:20 - BO 127
R 1:30-3:20; 6:30-8:20 - BO 201

Contact Information

Instructor: Dr. Bill Cook
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Course Description

Life I – Molecular & Cellular Concepts is the first in a three-course sequence designed for students majoring in the natural sciences. It introduces the principles and concepts that describe living systems at the molecular and cellular levels, including scientific methods of inquiry; features distinguishing viruses, prokaryotic, and eukaryotic cells; membrane structure and transport; metabolic processes and pathways; and macromolecules within an evolutionary framework.

Course Objectives

The successful student will

1. Understand and use scientific methods of inquiry and reporting
2. Identify properties of the major molecules of life.
3. Recognize the similarities and differences among viruses, prokaryotic cells, and eukaryotic cells.
4. Describe the structure of cell membranes and mechanisms for movement across membranes.
5. Identify important metabolic pathways including substrate, products, and regulatory interactions.
6. Describe information flow from nucleic acids to proteins including chemicals structures, synthesis, and regulation.
7. Recognize the unity and diversity of life and their origin in evolution through natural selection.

Textbook & Instructional Materials

Life – The Science of Biology, Sadava et al. 12th ed. with access to the MacMillan Achieve On-line Learning Site OR Achieve access only; Life 1 Laboratory Manual, Cook & Scales

Office Hours and Study Aids

The instructor's office hours are posted outside his office and across the hall from the Biology office, BO 218. Study aids, in addition to required exercises, are found in Life I Achieve, Student Resources.

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.
2020-2021 Student Handbook

Grading

Table 1: Percent values of each score category

Lecture

Assignments	Percentage
Exams	50%
Laboratory	25%
Achieve	25%
Total	100%

Laboratory

Assignments	Percentage
Weekly Assign.	75%
Communication: written, oral, visual	15%
Safety Compliance	10%
Total	100%

Table 2: Grade Standards

Grade	Percentages
A	90 to 100%
B	80 to 89.9%
C	70 to 79.9%
D	60 to 69.9%
F	Below 60%

Achieve Exercises

You will complete three sets of exercises through the MacMillan Achieve site that accompanies your textbook: Homework; Activities, Animations, and Simulations; and Data in Depth. A fourth set of exercises is available for extra credit.

Homework includes **Learning Curve** and **Summative Quizzes**

Learning Curve is a game-based means of evaluating your understanding of the subject you are studying. It presents you with a target score, which you must meet in order to earn credit (meet the target score: 100%; fall short of the target score: 0%). For each question you may answer or ask for a hint. Asking for a hint reduces the maximum possible score. If you answer the question incorrectly, you may try again, but for fewer points. Once you earn points, you can't lose them, so you and your understanding of the material will determine how long it will take you to reach the target score. I hope it would not occur to you to guess randomly; to do so incurs a penalty. Once you complete the challenge (earn the target score) you can continue to answer questions to further challenge your understanding. **For each chapter covered in the course, complete the *Learning Curve* exercise by Sunday midnight prior to the upcoming (Tuesday) exam**.

For each chapter, a ***Summative (chapter) Quiz*** will enable you to demonstrate your understanding of the concepts. Each quiz will include 20 questions. You will have one attempt to complete each quiz and will not be able to save your progress and return at a later time. These quizzes should be completed after you have done sufficient preparation to feel confident that you understand the concepts covered in the chapter. **For each chapter covered in the course, complete the *Summative Quiz* by Sunday midnight prior to the upcoming (Tuesday) exam**.

The **deadline for both** Learning Curve and Summative Quizzes will be **Sunday midnight** prior to each upcoming (**Tuesday**) exam.

Activities, Animations, and Simulations

Some chapters offer exercises classified as **Activities, Animations, or Simulations**. You will complete one Activity, one Animation, and one Simulation for each chapter that offers them. If you choose to complete more than one of each type of exercise for a given chapter, only the highest earned score for each will be counted.

The **deadline for** Activities, Animations, and Simulations will be **Sunday midnight** prior to each upcoming (**Tuesday**) exam.

Data in Depth

Some chapters offer **Data in Depth** exercises. Learning to process and interpret data as a basis for evaluating hypotheses is a fundamental job of an aspiring scientist. These exercises feature a variety of types of data and the opportunity to learn from them. For each chapter that offers a Data in Depth exercise, complete that exercise. If more than one Data in Depth exercise is offered, and more than one is completed, only the highest score will be counted.

The **deadline for** Data in Depth exercises will be **Sunday midnight** prior to each upcoming (**Tuesday**) exam.

Achieve Extra Credit

Some chapters provide **Media Clip and Video** exercises illustrating principles covered in the chapters. For each chapter that offers a Media Clip or Video, complete at least one of each. If more than one Media Clip or Video is offered and you choose to complete more than one, only the highest score will be counted. The average % score of your highest scoring Media Clip and Video scores will be calculated to determine the portion of the available extra credit points will be added to your final course score. Up to 5% will be added to your final course score if you successfully complete this extra credit assignment.

The **deadline for both** Media Clips and Videos will be **midnight Sunday** prior to each scheduled (**Tuesday**) exam.

Exams

Your comprehension of the material presented in the lecture portion of the course will be evaluated by three major exams. Scheduled exam dates are fixed. Do not make doctor/dentist or other appointments on exam dates, as they will not constitute excusable absences. Cell phones, electronic dictionaries, calculators, or other electronic aids may not be used during exams. Personal effects will be placed in the front of the classroom during exams. There will be no comprehensive final exam

Laboratory

Each week a laboratory exercise will provide an opportunity to study some aspect of biology directly. These exercises are intended to enhance the learning that is occurring through the lecture portion of the course. Questions regarding the laboratory work will be incorporated into scheduled examinations that will be administered in the lecture setting. Laboratory exercises are found in the required Laboratory Manual, available in the campus Bookstore. Modifications made necessary by SARS-CoV-2 safety restrictions will be distributed during each laboratory session to which they apply.

Extra Credit

Any extra credit that is awarded during the semester will be earned and not offered as a means of rescuing low scores at the last minute. Any extra credit opportunities will be made available to the entire class. **No a*d hoc* extra credit work for individuals will be offered or accepted**.

Late Work

Assignments with due dates must be successfully submitted by the deadlines. Successful, timely submission, following the instructions accompanying each assignment, is part of the assignment and will not be waived.

Desire-to-Learn (D2L)

D2L will be used as means of communicating and as a location where you can access resources that are required or useful for success in the course. You can log into D2L through the MSU Homepage. If you experience difficulties, please use links to technical help found in the D2L site. One mandatory assignment will be completed through a Discussion forum at your lab D2L page

Attendance

From the 2020-2021 Student Handbook, p. 61: “Students are expected to attend all meetings of the classes in which they are enrolled. Although in general students are graded on intellectual effort and performance rather than attendance, absences may lower the student’s grade where class attendance and class participation are deemed essential by the faculty member. In those classes where attendance is considered as part of the grade, the instructor should so inform students of the specifics in writing at the beginning of the semester in a syllabus or separate attendance policy statement. An instructor who has an attendance policy must keep records on a daily basis. The instructor must give the student a verbal or written warning prior to being dropped from the class. Instructor’s records will stand as evidence of absences. A student with excessive absences may be dropped from a course by the instructor. Any individual faculty member or college has the authority

to establish an attendance policy, providing the policy is in accordance with the General University Policies."

Instructor Class Policies

Out of courtesy to classmates and the instructor, please observe the following guidelines:

1) Don't walk through the front of the classroom after class has begun or before class has ended.
2) Don't carry on conversations during lectures, videos, examinations or other official class activities.
3) At the beginning of each class period, turn off cell phones (smart or otherwise), pagers and other electronic devices that may make noise, disrupt or distract.

Services for Students With Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Clark Student Center, Room 168, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to Disability Support Services.

University Policies

Campus Carry Rules/Policies
Refer to: Campus Carry Rules and Policies

Smoking/Tobacco Policy
University policy strictly prohibits the use of tobacco products in any building owned or operated by Midwestern State University. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy (2020-2021 Student Handbook, pp. 24-26)
To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State University are informed that strictly enforced policies are in place which prohibit the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Grade Appeal Process

To appeal a grade, consult the Midwestern State University 2020-2021 Student Handbook
2020-2021 Student Handbook

Tentative Lecture Schedule

The topics to be considered in this course are listed below. Material covered on each scheduled examination will be material presented prior to that exam. If coverage of material varies from this tentative schedule, you will be responsible for material that *has* been presented.

Date	Topic	Chapter(s)
Jan 12	Introduction; Studying Life	1
Jan 14	Studying Life; Small Molecules and the Chemistry of Life	1; 2
Jan 19	Small Molecules and the Chemistry of Life	2
Jan 21	Proteins, Carbohydrates, Lipids	3
Jan 26	Proteins, Carbohydrates, Lipids; Nucleic Acids and the Origin of Life	3; 4
Jan 28	Nucleic Acids and the Origin of Life	4
Feb 2	Cells: The Working Units of Life	5
Fab 4	Cells: The Working Units of Life	5
Feb 9	***Examination #1*** **[Achieve CH 1-5 due Feb 7, Midnight]**	
Feb 11	Cell Membranes	6
Feb 16	Cell Membranes; Cell Communication and Multicellularity	6; 7
Feb 18	Cell Commun. and Multicellularity; Energy, Enzymes, and Metabolism	7; 8
Feb 23	Energy, Enzymes, and Metabolism	8
Feb 25	Pathways that Harvest Chemical Energy	9
Mar 2	Harvesting Chemical Energy; Photosynthesis: Energy from Sunlight	9; 10
Mar 4	Photosynthesis: Energy from Sunlight	10
Mar 9	Cell Cycle and Cell Division	11
Mar 11	Cell Cycle and Cell Division; Inheritance, Genes & Chromosomes	11, 12
Mar 16	***Examination #2*** **[Achieve CH 6-11 due Mar 14, Midnight]**	
Mar 18	Inheritance, Genes & Chromosomes	12
Mar 23	DNA and its Role in Heredity	13
Apr 25	From DNA to Protein: Gene Expression	14
Apr 30	Mutation and Molecular Medicine	15
Apr 1	*Easter Break*	
Apr 6	Mutation and Molecular Medicine	15
Apr 8	Regulation of Gene Expression	16
Apr 13	Regulation of Gene Expression	16
Apr 15	Genomes	17
Apr 20	Genomes; Recomb. DNA and Biotechnology	17; 18
Apr 22	Recomb. DNA and Biotechnology	18
Apr 27	***Final Examination*** **[Achieve CH 12-18 due Apr 25, Midnight] 1:00-3:00 PM**	

Laboratory Schedule

Life I – Molecular and Cellular Concepts is a laboratory course. Attendance at, and active participation in, all lab meetings are mandatory and also important for you to get the intended exposure to a variety of topics and the means and methods by which some of those topics are investigated. Review of lab activities prior to the start of each lab is highly recommended, as several of the activities will be fast-paced and challenging to participate in without any preparation. The lab manual includes pages for some labs that will be turned in for credit toward the final lab score. Questions based on lab activities will be incorporated into major exams. Safety is as important to successful lab experience as engaged attendance. To that end, **10% will be deducted from each lab score for failure to be ready to begin on time, for failure to wear minimal personal protective equipment, and/or for bringing food or drink into the lab.**

The schedule of laboratory activities is listed below. Adjustments to the schedule may be made as necessary.

Date	Lab #	Exercise
Jan 14	1	How to Be a Biology Major
Jan 21	2	Quantitative Laboratory Skills
Jan 28	3	Measuring Bacterial Growth
Feb 4	4	Reporting Scientific Data
Feb 11	5	Care and Use of Microscopes
Feb 18	6	Measuring Enzyme Activity
Feb 25	7	Cell Division I: Modeling Mitosis and Meiosis
Mar 4	8	Cell Division II: Viewing Mitosis and Meiosis
Mar 11	9	Restriction Endonucleases and Gel Electrophoresis
Mar 18	10	Polymerase Chain Reaction
Mar 25	12	Bacterial Transformation
Apr 1		*Holiday Break*
Apr 8	13	Growth and Screening of Transformed Bacteria
Apr 15	14	Analysis of Transformation Screen
Apr 22	15	Student Presentations of Recent Research

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