Course Syllabus: Life I – Molecular & Cellular Concepts
BIOL 1114-201
Spring 2022
TR 8:00-9:20 - BO 213
T, W 1:30-3:20 - BO 214

Contact Information

Instructor: Dr. Bill Cook
Office: BO 218D; Lab: BO 330 (you are welcome to visit either site any time I am present)
E-mail: william.cook@msutexas.edu [This is the most effective means of making contact. Send e-mail from an address **outside of the D2L system**.]

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. This is a face-to-face class for which there is no on-line or hybrid option.

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. (including access to the MacMillan *Achieve* site); Life 1 Laboratory Manual, Cook & Scales **3rd Edition.** *Achieve* access for this course is part of the **Courseware Access and Affordability Program** at MSUTexas. Your materials will be available on the first day of class through this course's D2L table of contents. The charges for these materials have been posted to your account at the Business Office. If you wish to **opt-out of the Program** and purchase the required course materials independently, at a higher cost, you must do so **following the Opt-out instructions** sent to your official **my.msutexas.edu** email address on the second day of class. Please contact the MSU Bookstore if you have any questions about the opt-out process. The cost of your materials charged to your account through this program is: COSM Electronic Course-ware $80.99 + $ 6.68 (Tax). Comparable bookstore pricing: $117.00; Publisher's website cost: $89.99. If you have any questions or need assistance, please feel free to contact the MSU Bookstore (940) 397-4303.

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 at the Achieve, Student Resources Link. To find additional Student Resources provided by the University follow the link.

Covid-19 Considerations

Students testing positive for SARS-CoV-2 must isolate and report the confirmed case using this form: COVID-19 Reporting Form for Students. Unvaccinated students in close contact to a person who has tested positive for SARS-CoV2 must quarantine for 10 or more days depending on testing results. Time in quarantine/isolation counts as an absence. Breaking quarantine/isolation to avoid absences will incur sanction by the county (as a fine), the university, or both. A faculty member may submit an instructor drop for students accruing too many absences.

Student Handbook

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 that is not the work of the individual submitting the work). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct. 2021-2022 Student Handbook.

Grading

Table 1a: Percent values of each score category in Life I

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

Table 1b: Percent values of each score category in Life I Lab

Assignments	Percentage
Weekly Exercises	75%
Written Pre-labs	5%
Safety Compliance	10%
Teamwork Evaluation	10%
Total	100%

Table 2: Grades

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 Assignment

You will complete two chapter assignments, *Learning Curve* and *Summative Quiz*, for each chapter, through the MacMillan Achieve site accessed through the D2L Table of Contents. Enroll in the Achieve platform through the D2L Content link and complete these exercises for each chapter covered in the course.

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

Learning Curve is a game-based means of building your understanding of the subject you are studying. It presents you with a target score, which you must meet 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. Guessing randomly incurs a penalty. 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. 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 **midnight Sunday** prior to each scheduled exam. The combined scores from these exercises will comprise the Achieve assignment score.

Achieve Extra Credit Opportunity

Three types of exercise offered by Achieve may contribute to an extra credit score. Together, your best Animation, Simulation, and Data in Depth scores will add **up to** 5% to your final course score. To earn extra credit each of these exercises must be completed for each chapter that offers them.

Animations, Simulations, and Data in Depth

For each chapter that offers one or more Animations, Simulations, and/or Data in Depth exercises, complete at least one of each that is offered to earn extra credit. For chapters that offer more than one of these exercises, you may complete as many as you wish with the highest score in each category counted toward your final extra credit score. The **deadline** for Animations, Simulations, and Data in Depth exercises will be **midnight, Sunday**, prior to each scheduled exam.

Exams

Your comprehension of the material presented in the lecture portion of the course will be evaluated by four 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 lecture examinations that will be administered in the lecture setting. Laboratory exercises are found in the required Laboratory Manual, 3rd edition, available in the campus Bookstore. Modifications to the protocol presented in the manual, as required by unforeseen circumstances, may be provided in individual lab sessions. A **final laboratory examination** will be the subject of the final lab meeting.

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 (see the Achieve Extra Credit Opportunity, above). **No a*d hoc* extra credit work for individuals will be offered or accepted**.

Late Work

Assignments with due dates, including *Achieve* and D2L submissions, 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 a means of communicating, as a location where you can access resources that are required or useful for success in the course, and where you will submit some required work products. You can log into D2L through the MSU Homepage. If you experience difficulties, please use links to technical help found in the D2L site.

Attendance

From the 2021-2022 Student Handbook (2021-2022 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 (2021-2022 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 2021-2022 Student Handbook;
2021-2022 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 prior to an exam.

Date	Topic	Chapter(s)
Jan 11	Introduction; Studying Life	1
Jan 13	Studying Life; Small Molecules and the Chemistry of Life	1; 2
Jan 18	Small Molecules and the Chemistry of Life	2
Jan 20	Proteins, Carbohydrates, Lipids	3
Jan 25	Proteins, Carbohydrates, Lipids; Nucleic Acids and the Origin of Life	3; 4
Jan 27	Nucleic Acids and the Origin of Life	4
Feb 1	***Examination #1*** **[Achieve CH 1-4 due Jan 30, Midnight]**	

Tentative Lecture Schedule, continued

Feb 3	Cells: The Working Units of Life	5
Feb 8	Cells: The Working Units of Life	5
Feb 10	Cell Membranes	6
Feb 15	Cell Membranes; Cell Communication and Multicellularity	6; 7
Feb 17	Cell Commun. and Multicellularity; Energy, Enzymes, and Metabolism	7; 8
Feb 22	Energy, Enzymes, and Metabolism	8
Feb 24	Pathways that Harvest Chemical Energy	9
Mar 1	***Examination #2*** **[Achieve CH 5-8 due Feb 27, Midnight]**	
Mar 3	Photosynthesis: Energy from Sunlight	9; 10
Mar 8	Photosynthesis: Energy from Sunlight	10
Mar 10	Cell Cycle and Cell Division	11
Mar 15, 17	*Spring Break*	
Mar 22	Cell Cycle and Cell Division; Inheritance, Genes & Chromosomes	11, 12
Mar 24	Inheritance, Genes & Chromosomes	12
Mar 29	DNA and its Role in Heredity	13
Mar 31	DNA and its Role in Heredity	13
Apr 5	**Examination #3 [Achieve CH 9-12 due Apr 3, Midnight]**	
Apr 7	From DNA to Protein: Gene Expression	14
Apr 12	Mutation and Molecular Medicine	15
Apr 14	*Holiday Break*	
Apr 19	Regulation of Gene Expression	16
Apr 21	Genomes	17
Apr 26	Genomes; Recomb. DNA and Biotechnology	17; 18
Apr 28	Recomb. DNA and Biotechnology	18
May 5	***Final Examination*** **Thursday 8:00-10:00 AM [Achieve CH 13-18 due May 1, Midnight]**	

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 11, 12	1	How to Be a Biology Major
Jan 18, 19	2	Quantitative Laboratory Skills
Jan 25, 26	3	Measuring Bacterial Growth
Feb 1, 2	4	Reporting Scientific Data

Laboratory Schedule, continued

Feb 8, 9	5	Care and Use of Microscopes
Feb 15, 16	6	Measuring Enzyme Activity
Feb 22, 23	7	Cell Division I: Modeling Mitosis and Meiosis
Mar 1, 2	8	Cell Division II: Viewing Mitosis and Meiosis
Mar 8, 9	9	Restriction Endonucleases and Gel Electrophoresis
Mar 15, 16		*Spring Break*
Mar 22, 23	10	Polymerase Chain Reaction
Mar 29, 30	11	Biotechnology
Apr 5, 6	12	Bacterial Transformation
Apr 12, 13	13	Growth and Screening of Transformed Bacteria
Apr 19, 20	14	Analysis of Transformation Screen
Apr 26, 27	15	Laboratory Final Exam

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