# Course Syllabus: Life I – Molecular & Cellular Concepts
# BIOL 1114
# Spring 2019
# TR 9:30-11:00; BO 209
# M 1:30-3:20; 4:00-5:50; T 1:30-3:20; BO 329

## 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. 11th ed. (with access to the Sinauer/MacMillan LaunchPad site); 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 the LaunchPad, Life I Student Resources.

## 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Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given).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.
Student Handbook 2018-19

Grading

Table 1: Percent values of each score category

Lecture

| Assignments | Percentage |
|---|---|
| Exams | 55% |
| Laboratory | 25% |
| LaunchPad | 20% |
| Total | 100% |

Lab

| Assignments | Percentage |
|---|---|
| Weekly Assign. | 70% |
| Written/Oral | 20% |
| Protein Pptx | 10% |
| Total | 100% |

Table 2: Grade Standards

| Grade | Percentages |
|---|---|
| A | 90 to100% |
| B | 80 to 89.9% |
| C | 70 to 79.9% |
| D | 60 to 69.9% |
| F | Below 60% |

## LaunchPad Exercises

You will complete two sets of exercises through the Sinauer/MacMillan LaunchPad site that accompanies your textbook.

***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 it 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 prior to the corresponding exam**.

For each chapter, a ***Summative (chapter) Quiz*** will enable you to demonstrate your understanding of the concepts. Each quiz will include 10 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* prior to the corresponding exam**.

The combined scores from these exercises will make up 20% of the final grade.

## 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 examinations that will be administered in the lecture setting. Laboratory exercises are found in the required Laboratory Manual, available in the campus Bookstore. The first laboratory meeting, which is required, will precede the first meeting of the lecture portion of the course for some students.

## Extra Credit

Any extra credit that is awarded during the semester will be earned and not offered as a means of rescuing low scores. 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 2018-18 Student Handbook: 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 WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy
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 2018-2019 MSU Undergraduate Catalog

## Lecture Schedule

The topics to be considered in this course are listed on the following page. Material covered on each scheduled examination will be material covered prior to that exam. If coverage of material lags behind this schedule, you will be responsible for material that *has* been covered.

| Date | Topic | Chapter(s) |
|---|---|---|
| Jan 15 | Introduction; Studying Life | 1 |
| Jan 17 | Studying Life; Small Molecules and the Chemistry of Life | 1; 2 |
| Jan 22 | Small Molecules and the Chemistry of Life | 2 |
| Jan 24 | Proteins, Carbohydrates, Lipids | 3 |
| Jan 29 | Proteins, Carbohydrates, Lipids; Nucleic Acids and the Origin of Life | 3; 4 |
| Jan 31 | Nucleic Acids and the Origin of Life | 4 |
| Feb 5 | *Examination #1* [LaunchPad CH 1-4 due Feb. 4, Midnight] | |
| Feb 7 | Virus Particles | 5, 26 |
| Feb 12 | Cells: The Working Units of Life | 5 |
| Feb 14 | Cells: The Working Units of Life; Cell Membranes | 5; 6 |
| Feb 19 | Cell Membranes | 6 |
| Feb 21 | Cell Communication and Multicellularity | 7 |
| Feb 26 | Cell Commun. and Multicellularity; Energy, Enzymes, and Metabolism | 7; 8 |
| Feb 28 | Energy, Enzymes, and Metabolism | 8 |
| Mar 5 | *Examination #2* [LaunchPad CH 5-8 due Mar. 4, Midnight] | |
| Mar 7 | Pathways that Harvest Chemical Energy | 9 |
| Mar 12 | Paths that Harvest Chem. Energy; Photosynthesis: Energy from Sunlight | 9; 10 |
| Mar 14 | Photosynthesis: Energy from Sunlight | 10 |
| Mar 19 | *Spring Break* | |
| Mar 21 | *Spring Break* | |
| Mar 26 | Cell Cycle and Cell Division | 11 |
| Mar 28 | Cell Cycle and Cell Division; Genes, Chromosomes, and Genomes | 11; 12/17 |
| Apr 2 | Genes, Chromosomes, and Genomes; DNA and its Role in Heredity | 12/17; 13 |
| Apr 4 | DNA and its Role in Heredity | 13 |
| Apr 9 | *Examination #3* [LaunchPad CH 9-13, 17 due Apr. 8, Midnight] | |
| Apr 11 | From DNA to Protein: Gene Expression | 14 |
| Apr 16 | DNA to Protein: Gene Express.; Gene Mutation and Molecular Medicine | 14; 15 |
| Apr 18 | Gene Mutation and Molecular Medicine | 15 |
| Apr 23 | Regulation of Gene Expression | 16 |
| Apr 25 | Regulation of Gene Expression; Recombinant DNA and Biotechnology | 16; 18 |
| Apr 30 | Recomb. DNA and Biotechnology; Genes, Development, and Evolution | 18; 19 |
| May 2 | Genes, Development, and Evolution | 19 |
| May 7 | *Final Examination* [LaunchPad CH 14-19 due May 6, Midnight]<br>Tuesday, May 7, 8:00-10:00 | |

## 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.

| Date | Lab # | Exercise |
|---|---|---|
| Jan 14, 15 | 1 | How to Be a Biology Major |
| Jan 21, 22 | | ***Martin Luther King, Jr. Day*** |
| Jan 28, 29 | 2 | Quantitative Laboratory Skills |
| Feb 4, 5 | 3 | Measuring Bacterial Growth |
| Feb 11, 12 | 4 | Reporting Scientific Data [Meeting in FE 300] |
| Feb 18, 19 | 5 | Care and Use of Microscopes |
| Feb 25, 26 | 6 | Measuring Enzyme Activity |
| Mar 4, 5 | 7 | Cell Division I: Modeling Mitosis and Meiosis |
| Mar 11, 12 | 8 | Cell Division II: Viewing Mitosis and Meiosis |
| Mar 18, 19 | | ***Spring Break*** |
| Mar 25, 26 | 9 | Restriction Endonucleases and Gel Electrophoresis |
| Apr 1, 2 | 11 | Mining Genetic Data [Meeting in FE 300] |
| Apr 8, 9 | 12 | Bacterial Transformation |
| Apr 15, 16 | 10, 13 | Growth and Screening of Transformed Bacteria Using PCR |
| Apr 22, 23 | 14 | Analysis of PCR Products and Plasmid Identification |
| Apr 29, 30 | 15 | Student Presentations of Recent Research |

The final lab score will be calculated from weekly exercises (including lab reports), a written literature review, an oral literature review, and a PowerPoint presentation describing a protein.

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- ◊ **LaunchPad Activation Instructions**

Follow these steps to get started with on-line textbook resources and assignments. If you need additional guidance, consult the support site, especially the system requirements which list recommended browsers.

Go to http://www.macmillanhighered.com/launchpad/life11e/9756242

Bookmark the page to make it easy to return to (the URL will look different per security measures).

Enroll in this course using one of the following options:

If you have an **access code**, select "I have a student access code", enter the code exactly as it appears on the card, and click Submit.

If you don't have an access code, either **purchase a text package that includes one** OR click "I want to **purchase access**" and follow the instructions.

If you need to start working but can't purchase right away, select "I want **temporary access**" and follow the instructions. Please note: Your grades are linked to your Launchpad account username (email address). If you use temporary access, make sure you purchase or register your code using the same email address for your paid access.

If you have problems, please contact Customer Support or by phone (800) 936-6899.