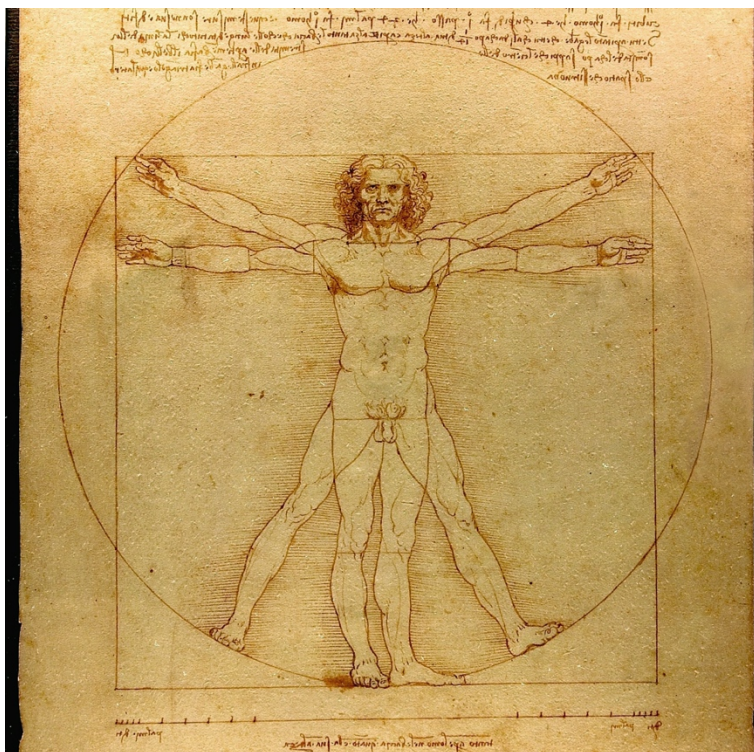


# **Cell and Molecular Biology (*online class*)** **BIOL360 (3) CRN 73840, 73856**

## **Course Syllabus**



Leonardo da Vinci. *The Vitruvian Man* (drawing circa 1490)  
Gallerie dell'Accademia, in Venice, Italy.

**Andrej Podlutsky**

**University of Alaska Fairbanks**

**Fall Semester 2021**

**Classes: online, asynchronous class**

Course covers current knowledge of cellular and molecular biology: cell chemistry, transcription, translation, cell architecture, metabolism, signal transduction pathways, DNA repair and genome stability, cell division, and the cell cycle.

Version: 08/17/2021

This syllabus is **subject to change**

Course syllabus\*, content and format are modified from earlier offerings of Biology 360.

**Syllabus: BIOL360 Cell and Molecular Biology, online class**  
**CRN 73840, CRN 73856**

3 Credits

Prerequisites: BIOL F260; CHEM F105X; CHEM F106X or concurrent enrollment.

**Lectures are:** asynchronous class, lectures on the BlackBoard

Topic: BIOL360-2021

**Required Textbook: *Essential Cell Biology (5th edition)* by Alberts et al. and Smartwork5 for the homework assignments**

**Instructors:**

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Available by zoom or phone

**Course description:** This course will provide an introduction to cell biology and will cover the following topics: cell chemistry, transcription, translation, cell architecture, metabolism, signal transduction pathways, cell division, and the cell cycle. Students will also learn current molecular biological techniques that are used to study these topics in the laboratory.

**Course goals:** Students will gain knowledge of cell structure and function, learn techniques commonly used in cell biology, sharpen their critical thinking skills, and gain insight to the cellular and molecular basis of disease.

**Student Learning Outcomes:**

Students will gain knowledge of cellular and molecular processes, learn techniques commonly used in biology research, sharpen their critical thinking skills, and gain insight into the cellular and molecular mechanisms present in prokaryotic and eukaryotic cells.

Students will be able to:

- read and understand current literature on topics of cellular and molecular biology;
- understand mechanisms of cellular communication within multicellular organisms;
- comprehend contemporary theories of evolution and origin of life;
- understand how cells obtain and utilize energy;
- understand difference between mitosis and meiosis;
- understand scientific approach to study gene expression and cellular communication processes;
- gain knowledge on genome instability and cancerous transformation;
- understand importance of genetic mutations and cellular senescence;
- gain experience in communicating science through discussions and exams.

**Instructional methods:** This course will be taught through a combination of lecture videos, problem solving, and reading scientific publications.

**Format of the course:** The course contains 10 modules, covering 20 chapters of the textbook.

Lectures and videos will be posted online according to the table below. However, students are encouraged to read textbook and take notes at their own pace.

**ASSIGNMENTS:** This course uses on-line platforms Blackboard and integrated Smartwork5.

**Smartwork5:** integrated into Blackboard and maintained by WWNorton.com (The publisher of the “Essential Cell” textbook).

All ten modules include homework assignments that should be completed by students no later than one week after the end of module. For example, Module-1, week 1 and 2, from August-23 to September-4, the corresponding Smartwork5 assignments should be completed by September-4. For the Module-1, covering Chapter-1&2, Smartwork5 assignment has no limit for “attempts” to answer the question. While working with Modules 2-10, however, you will have two “attempts” to answer the question. Please, work with the textbook/lectures/videos prior to taking Smartwork5 tests.

Each test will have maximum of 10 points, and grading will be scaled accordingly. For example, if you received 25/30 points in Smartwork5 but the assignment is worth 10 points, then your grade is 8.33 points.

**Exams:** Exams will be based on material covered in lectures, textbook and videos.

**Exams will be proctored.** Student would need to schedule exam with iTeach service of the UAF. Details will be provided. Exam window – 2 days (for example, in the table below Exam-1 is scheduled for September-30, it will be possible to schedule exam on September-30 and November-1).

**Blackboard:** Slides used in lecture will be posted on Blackboard.

**Email Etiquette:** I will do my best to respond to your email inquiries within 24 hrs. Please be considerate in your letters and use proper English grammar. Think before you send and never write anything you would feel uncomfortable saying to me (or anyone else!) in person. Please sign your letter; addresses don’t always reveal the identity of the writer. I normally do not accept assignment via email.

**Disabilities:** I will work with the Office of Disabilities Service (203 WHIT, 474-7043) to provide accommodations in both the classroom and laboratory to provide equal access to all materials in this course to all students.

**Grading:** Your final grades will be based on the following:

**(1) Exams (450 points):** There will be four exams during the semester, one of which is the final exam. Each exam will count for 100 points (final exam 150 points total). The final exam will be 50% new material and 50% cumulative material. The questions at the end of each chapter are an excellent study guide. I strongly suggest that you test yourself with these questions after reading each chapter. Up to twenty points from

each exam might be in the form of take-home questions in which you apply the knowledge you learn in class to solve problems.

**(2) Home work assignments (100):** five home works assignments will be made during the course, 20 points each.

**BONUS:** to earn extra points (maximum – **25 points**) you will need to choose some exciting topic in “cell and molecular biology” and make a presentation for the whole class. Also, you will summarize your presentation in a 4-page report (single spaced, including reference list). The topic should be interesting to everyone in the class; you could present your own research, but in a very illuminating way. Presentation length – 5-7 minutes, 6-7 slides. Bonus points will be added to the total sum before the final grade is calculated. If you decide to earn the bonus points, please send me an e-mail indicating the title of your presentation before November-30. Videos should be recorded and link sent to me, I will post it on BlackBoard

In summary, your grade will be based on the following:

Component	Points	% of grade
<b>Exams</b> (3 at 100 pts each)	300	~54%
<b>Final Exam</b> (new + cumulative)	150	~27%
<b>Home work</b>	100	~19%
<b>Σ Total</b>	<b>550</b>	<b>100%</b>

Grades: A= 90–100%, B= 80–90%, C= 70–80%, D= 60–70% and F< 60%.

**Secrets to success:** We will cover a large amount of material during this semester. Some of it may be familiar to you, but many topics will be new. There are few techniques you can use to help you to succeed in this course.

- 1) Read the book before the lecture.** This will allow you to familiarize yourself with the material before I cover it. Please, please, never be afraid to ask a question.
- 2) Take notes during lecture and while reading.** This is an excellent way to reinforce your learning of the material. Although I will post slides on Blackboard of the lecture, I will discuss the material in much more detail than is on the slide and you will be responsible for this material on the exam.
- 3) Review your notes shortly after lecture,** and ask me again if something is unclear, or fill in missing pieces with information from the text. Also (number 3.5), as I stated above, test yourself by answering the questions at the end of the text.
- 4) Quiz yourself\*\*\*\*.** Use questions at the end of each chapter to test your understanding of the material. These questions are a GREAT way to study!!!

**Most of all, do not procrastinate!** There is no way you can do well on an exam in this course by waiting until the night before the exam to study.

**A document “What is Plagiarism” is placed on BlackBoard** (*Document provided by Turnitin.com and Research Resources. Turnitin allows free distribution and non-profit use of this document in educational settings.*)

Version: 01/05/2021  
 This syllabus is **subject to change**

Date	modul e	Lecture	Book Chapter	Smartwork5 completion deadline
Week-1 Aug-23	1	Introduction to Cell	Ch 1	September-4
Week-2 Aug-30		Introduction and Cell Chemistry	Ch 2	
Week-3 Sept-6	2	Energy	Ch 3	September-18
Week-4 Sept-13		Proteins	Ch 4	
Week-5 Sept-20	3	DNA and Chromosomes	Ch 5	October-2
Week-6 Sept-27		DNA Replication and Repair	Ch 6	
Week-6 September-30 Exam-1 chapters 1-6				
Week-7 Oct-4	4	From DNA to protein	Ch 7	October-16
Week-8 Oct-11		Control of Gene Expression	Ch 8	
Week-9 Oct-18	5	Genes and Genomes	Ch 9	October-23
		Modern DNA technology	Ch 10	

Week-10 Oct-25	6	Membrane Structure	Ch 11	October-30
		Transport	Ch 12	
Week-11 Nov-1	7	Metabolism	Ch 13	November-6
		Mitochondria	Ch 14	
Week-11 November-4 Exam-2 chapters 7-14				
Week-12 Nov-8	8	Protein Transport	Ch 15	November-13
		Cell Communication	Ch 16	
Week-13 Nov-15	9	Cytoskeleton	Ch 17	November-20
		Cell Division	Ch 18	
Week-14 Nov-22	10	Sexual reproduction	Ch 19	December-4
Week-15 Nov-29		Cancer	Ch 20	
Week-15 November-30 Exam-3 chapters 15-20				
FINAL EXAM December-6 chapters 1-20				

Following section is taken from the UAF web-site:

<http://uaf.edu/usa/student-resources/conduct/#condu>

#### Student Code of Conduct (BOR POLICY 09.02.02)

- A. As with all members of the university community, the university requires students to conduct themselves honestly and responsibly and to respect the rights of others. Students may not engage in behavior that disrupts the learning environment, violates the rights of others or otherwise violates the Student Code of Conduct (Code), university rules, regulations, or procedures. Students and student organizations will be responsible for ensuring that they and their guests comply with the Code while on property owned or controlled by the university or at activities authorized or sponsored by the university.
- B. The university may initiate disciplinary action and impose sanctions on any student or student organization found responsible for committing, attempting to commit, or intentionally assisting in the commission of any of the following prohibited forms of conduct:
  1. cheating, plagiarism, or other forms of academic dishonesty;
  2. forgery, falsification, alteration, or misuse of documents, funds, property or electronic records;
  3. damage or destruction of property;
  4. theft of property or services;
  5. harassment;
  6. discrimination;
  7. hazing;
  8. endangerment, assault, or infliction of physical harm;
  9. gender-based or sexual misconduct;

10. disruptive or obstructive actions;
  11. mistreatment of animals;
  12. misuse of firearms, explosives, weapons, dangerous devices, or dangerous chemicals;
  13. failure to comply with university directives;
  14. misuse of alcohol;
  15. misuse of drugs or other intoxicants;
  16. violation of regents' policy, university regulation, rules, or procedures; or
  17. any other actions that result in unreasonable interference with the learning environment or the rights of others.
- C. Examples of actions that constitute these prohibitions will be described in the university regulation and MAU rules and procedures.
- D. This policy and university regulation and MAU rules and procedures are not intended to define prohibited conduct in exhaustive terms, but rather to set forth examples to serve as guidelines for acceptable and unacceptable behavior.

The university has established procedures for enforcing the UA code of conduct. Each student at the university shall be afforded due process in all disciplinary matters. For a complete guide to these procedures, please refer to [Board of Regents Policy and University Regulation 09.02](#) (PDF).