

MCB 170C1 Evolution of Modern Biology Syllabus- Spring 2022

Instructor:	Dr. Angel C. Pimentel
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Office Phone	520-626-1045
Office Hours Via	Monday 10-11 AM
Zoom:	Thursday 4-5 PM
Class Times	Tuesdays and Thursdays from 2 to 3:15
Location of the Class	Chavez Bldg., Rm 400

How do you get in touch with the instructor? I am here to assist you in this learning experience. I encourage each one of you to visit my Zoom office hours if you have any doubts, problems or other class/academic related issues. My office hours are listed above. If that time doesn't work, email me your class related questions. We can also talk after the class and if necessary we can set up an appointment. ***There is no reason for not getting in touch with me.*** I can be reached using my university email address (pimen@email.arizona.edu) or by phone (520) 626-1045. I check my email several times during the day. You should expect a reply within 24 hours business hours after you send your message. However, if you email me on a Friday after 4:00 PM you should expect a response on Monday morning.

Course materials: This class does not require you to buy a textbook. All the material will be posted in the in D2L by the instructor.

Course description: As citizens of the modern world, we face a barrage of information on nearly every topic. Recent advances in biology have significant impact on our personal health choices, our consumer choices, and even our choices as potential parents. ***We don't have time or the necessary background to sort out the myths and misconceptions from what we should take as accurate interpretations.*** In this course we will discuss basic principles that allow life to take place in our planet. The course will also focus on the ethics of any application that result from this knowledge and how to interpret biological information as it is presented in the popular press. We will deconstruct some commonly held misconceptions of how life works.

Course Methodology: Each class period will start with a **short** lecture, which will be followed by a group activity that students will complete in groups. The activities will be based on the pre-class readings, playposit videos and/or the short introductory lecture. Students should read the assigned material and complete and/or playposit videos (if available) before coming to class. Each class will end with an instructor-led debriefing of the activity. **Course Format and Teaching Methods:** We will meet face to face in the Cesar Chavez Building room 400 on Tuesdays and Thursday from 2:00 to 3:15 PM.

Course objectives and Learning Outcomes:

Biology focuses on understanding how living things interact with the environment as well as members of other species and how life, in general, works. In the last century, this field has experienced an explosion of knowledge from the determination of the structural organization of the DNA molecule, genetic manipulation, which allows us to create genetically modified plants and animals, to the sequence of the human genome. Thus, this knowledge not only helps us to fulfill our scientific curiosity but it also provides us with the possibility of manipulating biological processes for the benefit of humanity. This course is designed with three goals in mind: 1) understand the basic biological processes that allow life to exist on earth, 2) understand the theory of evolution and explain how this process has molded life on earth at the organismal and molecular levels, 3) have a better perspective on how biology has a direct impact on our day to day lives. The course will also present current research involving bioethical issues such as stem cell research and regenerative medicine using tissue cloning. It is expected that at the end of this course students should be able to think critically about the basic principles that serve as a driving force that allows life to occur on earth. Specifically, at the end of the semester should be learning

- 1- That all organisms are made of cells and what that means.
- 2- The theory of evolution and how this process has molded life on earth at the organismal and cellular level.
- 3- How does cells interact with their environment.
- 4- How cells function and process energy.
- 5- How cells divide and how cancer develops when this process malfunctions.
- 6- How cells increase their genetic diversity through meiosis.
- 7- The basic principles of genetics.
- 8- How cells process their genetic information.
- 9- How the genetic information can be manipulated to create genetically modify organisms.
- 10-How stem cell, cloning, and genetic manipulation can be used to cure diseases.
- 11-How the immune system works.
- 12-How vaccines were discovered.
- 13-How vaccines are made

Learning Outcomes:

After the completion of the course students must be able to:

- 1- Explain the steps of the scientific method and clinical trials and describe how these two related steps protect the integrity of science as well as the well-being of the public.
- 2- Describe why the cell theory and the theory of evolution are considered the two unifying principles of life on earth.
- 3- Explain the dogma of molecular biology and describe each step of this dogma.
- 4- Describe what is cancer and why it is considered a disease of cell division.
- 5- Explain how Biology has helped law enforcement and criminal justice systems.
- 6- Be able to explain the immune system
- 7- Describe how vaccines were discovered.
- 8- Be able to explain how vaccines have been created during the last 200 years, including. The new technology used in the Covid-19 vaccines.
- 9- Understand the two Mendelian Principles of genetics.

10-Explain, what genetic mutations are?

Classroom expectations.

1. Face coverings are required in our classroom: Per UArizona's [Administrative Directive](#), face coverings that cover the nose, mouth, and chin are required to be worn in all learning spaces at the University of Arizona (e.g., in classrooms, laboratories and studios). Any student who violates this directive will be asked to immediately leave the learning space and will be allowed to return only when they are wearing a face covering. Subsequent episodes of noncompliance will result in a Student Code of Conduct complaint being filed with the Dean of Students Office, which may result in sanctions being applied. The student will not be able to return to the learning space until the matter is resolved.
2. Physical distancing is required in our classroom: During our in-person class meetings, we will respect CDC guidelines, including restricted seating to increase physical distancing and appropriately worn face coverings. Per UArizona's Administrative Directive, face coverings that cover the nose, mouth, and chin are required to be worn in all learning spaces at the University of Arizona (e.g., in classrooms, laboratories and studios). Any student who violates this directive will be asked to immediately leave the learning space and will be allowed to return only when they are wearing a face covering. Subsequent episodes of noncompliance will result in a Student Code of Conduct complaint being filed with the Dean of Students Office, which may result in sanctions being applied. The student will not be able to return to the learning space until the matter is resolved.
3. The Disability Resource Center is available to explore face coverings and accessibility considerations if you believe that your disability or medical condition precludes you from utilizing any face covering or mask option. DRC will explore the range of potential options as well as remote course offerings. Should DRC determine an accommodation to this directive is reasonable, DRC will communicate this accommodation with your instructor.
4. I encourage mutual respectful conduct among all the members of this class which, includes the instructor, TA, preceptors and students.
5. Please participate, and do so with consideration to fellow students. Commenting and conversing out of turn with students next to you is very disruptive. Respect the right of your fellow students to learn.
6. I will post the Power Point presentation files and handout(s) in the D2L site of the class. You are responsible reviewing this material.
7. The primary method of communication with my students out of class is email. Please check your email each day.
8. I like to enhance my classes with a myriad of resources. Most of these resources are found on the Internet. I will post this supportive material in D2L. You are responsible for visiting D2L every day and look for course announcement(s).

Readings: Readings are assigned for most lectures. Carefully read the readings **in advance** of each class. The reading schedule can be found at the end of this syllabus.

Course Website: Course materials and announcements for this section are found on the course website, at <http://www.d2l.arizona.edu>. Log on using your NetID and password, and then click on the course link. To access the class website, you must be registered as a student in this section of the course.

- Check the D2L site daily for class announcements.
- D2L provides a convenient way for us to get in touch with you. If you do not use your D2L e-mail account, set your preferences so that D2L e-mail is forwarded to an e-mail account that you check frequently.
- All class assignments will be administered through the site.

The D2L gradebook is the official way to list your scores for all of the work in the class. Check your grades frequently to ensure that the scores recorded in the D2L gradebook are correct. If you think that an error has occurred, please contact the instructors immediately. Scores are considered final as of either three weeks after they are posted on D2L or the Thursday before the final exam, whichever comes first. After this, we will not make adjustments to the grade book.

Attendance Policy:

“The University of Arizona’s Attendance Policy. Students are expected to be regular and punctual in class attendance and to fully participate in the course. The University believes that students themselves are primarily responsible for attendance and class participation. Since students may be permitted to add classes beyond the official start date, instructors should be attentive to student enrollment dates when assessing adequate participation for the purposes of administrative drop.

Excessive or extended absence from class is sufficient reason for the instructor to administratively drop the student from the course. For accelerated courses and for those courses in which enrollment is limited, missing the first class session may be interpreted as excessive absence. The date the administrative drop is posted on the class roster in UAccess Instructor Center determines how the drop affects the student’s academic record. If the administrative drop is completed by

the first drop deadline, it will result in cancellation of registration in the course.

The first and second drop deadlines are defined below.”

<http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

1. If you feel sick, or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel.
2. Notify your instructor(s) if you will be missing a course meeting or an assignment deadline.
3. Non-attendance for any reason does not guarantee an automatic extension of due date or rescheduling of examinations/assessments.
4. Please communicate and coordinate any request directly with your instructor.
5. If you must miss the equivalent of more than one week of class, you should contact the Dean of Students Office DOS-deanofstudents@email.arizona.edu to share documentation about the challenges you are facing. Voluntary, free, and convenient COVID-19 testing is available for students on Main Campus.
6. If you test positive for COVID-19 and you are participating in on-campus activities, you must report your results to Campus Health. To learn more about the process for reporting a positive test, visit the Case Notification Protocol. COVID-19 vaccine is available for all students at Campus Health. Visit the [UArizona COVID-19 page](#) for regular updates.
7. If you miss a lecture, it is your responsibility to obtain any material distributed during the class that you missed. Remember: you are part of a learning community, contact fellow students for help and information. I consider my class a community of learners.
8. Each class lasts for one hour and fifteen minutes. During the first five to ten minutes of the class, the student will have to submit a homework assignment or to answer a quiz using the clickers. At the end of the class, the students will also have to answer some questions to test their comprehension of the material.

Participating in the course and attending lectures and other course events are the most important engagement actions that students could make in order to successfully complete this class. Thus, attendance and engaging in the class activities are highly recommended

For the official UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

Holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences must be pre-approved by the instructors BEFORE the given holiday. Absences pre-approved by the UA Dean of Students (or Dean designee) will be honored.

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable: <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences preapproved by the UA Dean of Students (or dean's designee) will be honored. See <http://policy.arizona.edu/employmenthuman-resources/attendance>.

- 1- **Midterms and finals exam:** There will be Three midterm exams (February 17, March 17, April 21) and a final exam on Monday May 9 from 3:30 to 5:30 PM.
- 2- The format for the exams will be multiple-choice and/or true/false questions. These questions are based on the learning objectives and key questions for each class topic. The final exam will be offered only on the date and time assigned by the registrar's office. The exams will take place during the class period.
- 3- The same policy applies to in-class activities, class participation points and quizzes
- 4- All exams (including the final examination) will have a value of 100 points. The date and time of the final exam or project, along with links to the Final Exam Regulations. **Students will be allowed to bring to the exam a cheat sheet. If after the 4th exam the student grade add up to an A, or if the student is happy with their current grade, the student won't have to take the final exam.**
- 5- **Attendance and participation:** Students' attendance will be monitored, as will their active participation in the class as evidenced by questions, comments, participation in class activities, etc.

Writing assignment: A minimum of 5 **short reflection assignments**. topics of these assignments will be related to the material discussed in class. For each assignment a number of guided questions will be listed that students should use as a framework to write their reflection.

Rubric Scoring Criteria for Reflection Writing Assignment		
Possible	Possible Points	Student's Score
The response to the guide question are clearly written with acceptable grammar and paragraph development	25	
The response is thorough and concise; it includes an appropriate level of detail that supports the presented ideas.	25	
The response demonstrates an acceptable level of understanding about the topic.	50	

Grading Policy: Grades in this class are based on the following assessments:		
Assignment/Activity	Number of Assignment and points for each	Total of Points for Each Assignment Category
3 Midterm exams	3@ 100 each	300
1 Final Exam	1 @ 100 points	100
20 Playposit videos	20 @ 2.5 points each	50
10 In Class Activities	10 @ 5 points each	50
5 Writing Assignments	5 at 20 points each	100
Total Class Points		600

Final Grade: The final grade will be based on the University of Arizona following grade scale <http://catalog.arizona.edu/policy/grades-and-grading-system>. Students can keep track of their progress in the class by referring to the following table, which presents the point grade corresponding to each letter grade.

A	100- 90%
B	89-80%
C	79-70%
D	69-60%
E	> 50%

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See <http://deanofstudents.arizona.edu/codeofacademicintegrity> and <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these

copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

Audit Grades: Students registered for Audit will receive “O” grades. This course is not offered as Pass/Fail. Switching from a letter grade to an audit is not allowed.

Incompletes: In situations of extreme circumstances, I will discuss this option with the student. I will weigh the severity of the situation and take a decision. The circumstances must be valid and documented. Students who do not take the final exam will, in general, receive a grade of 0 for the final exam and an “E” for the course. In accordance with University policy, the grade of “I,” or incomplete, can only be awarded in the case of students whose circumstances prevent them from finishing the required work for the course. In every case, an “I” must be approved before the last week of classes by the instructor. If a student is expected to complete the course, the grade of “E” must be assigned. Students must make arrangements with the instructors to receive an incomplete before the last week of classes. Incompletes that are not removed by the instructor within one year are converted to “E” grades. For undergraduate courses, the one-year limit may be extended if approved by the instructor and the dean of the college in which the student is registered. Please read the official policies of the University of Arizona in regards to incomplete.
<http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete>

Dispute of Grade Policy. Students can dispute a grade up to one week after the exam and exam key is made available in D2L. To dispute a grade, you should submit a grade appeal; this form is found in the content area of D2L. Follow all the instructions provided in the form. The instructor has the right to deny a grade appeal form if the instructions of the form are not followed. You should expect to receive a response to grade appeal within 2 weeks after the due date of the grade appeal from submission.

Late work policy: Late work will not be accepted for credit without a documented medical excuse.

Attendance policies: There will be two one hour and fifteen minutes class meetings per week. You must attend them all. You may take notes on your laptops if you wish, but please refrain from email, Internet surfing, and other such activities.

Special needs and accommodations: Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Student Code of Academic Integrity: Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However,

graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog.

See: <http://dos.web.arizona.edu/uapolicies/cai2.html>

Classroom Behavior

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Threatening Behavior: In the event of threatening behavior by one of the students in the course, official policies and procedures will be followed as described at <http://policy.web.arizona.edu/~policy/threaten.shtml>. “Threatening behavior” means any statement, communication, conduct or gesture, including those in written form, directed toward any member of the University community that causes a reasonable apprehension of physical harm to a person or property. The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

Notification of Objectionable materials:

Some course content including genetics of behavior, sexual reproduction and evolution, in particular may be deemed offensive by some students. Students are urged to consider their comfort with the biological coverage of these topics before they commit to taking the class. The instructor will provide advance notice when such materials will be used. Students are not automatically excused from interacting with such materials, but they are encouraged to speak with the instructor to voice concerns and to provide feedback.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Confidentiality of Student Records: Please see <http://www.registrar.arizona.edu/ferpa/default.htm>

Additional **Resources for Students** that the instructor will urge students to read.

UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies>.

Student Assistance and Advocacy information is available at <http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Disclosure: Early Progress Grades

This course is reporting Early Progress Grades in UAccess between September 18th and October 6th, 2017. The Early Progress Grade will include all graded coursework up to October 6th, 2017. This is an opportunity to assess your current performance and make adjustments as needed to earn the grade that you want this semester. Make a plan to finish strong!

Academic advising: If you have questions about your academic progress this semester, please reach out to your academic advisor (<https://advising.arizona.edu/advisors/major>). Contact the Advising Resource Center (<https://advising.arizona.edu/>) for all general advising questions and referral assistance. Call 520-626-8667 or email to advising@.arizona.edu

Life challenges: If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at (520) 621-2057 or DOS-deanofstudents@email.arizona.edu.

Physical and mental-health challenges: If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520) 621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

Statement on compliance with COVID-19 mitigation guidelines: As we enter the Fall semester, your and my health and safety remain the university's highest priority. To protect the health of everyone in this class, students are required to follow the university guidelines on COVID-19 mitigation. Please visit www.covid19.arizona.edu.

For lecture recordings, which are used at the discretion of the instructor, students must access content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UArizona values and educational policies (Code of Academic Integrity and the Student Code of Conduct) are also subject to civil action.

Changes to this syllabus:

The information contained in this syllabus, other than the grading and missed-exam policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor <http://policy.arizona.edu/faculty-affairs-and-academics/course-syllabus-policy-undergraduate-template>.

Tentative Class Schedule: This Schedule could changes as deem necessary by the instructor.

Week		
1	Jan 13	The way we study life: the scientific method.
2	Jan 18	Clinical trials for drugs approval and what is an emergency approval process?
	Jan 20	Molecules of Life.
3	Jan 25	The Cell Membrane
	Jan 29	The Cell
4	Feb 1	The Cell
	Feb 3	Transcription
5	Feb 8	What are viruses, why some don't infect us and why others do.
	Feb 10	The Immune system
6	Feb 15	History of vaccines; how they were discovered, how they were produced over the last 200 years and what is an mRNA vaccine.
	Feb 17	First Exam
7	Feb 22	Understanding how cells come from other cells: The cell cycle and Mitosis. Cancer
	Feb 24	How do multicellular organisms sexually reproduce by meiosis?
8	Mar 1	How did the gardener of a monastery turn out in the lecture room of every university? The rise of genetics.
	Mar 3	Complexities of human genetics, from sex to depression. Part I

9	Mar 8	TBA
	Mar 10	Complexities of human genetics, from sex to depression. Part II
10	Mar 15	Case Study: How did the structure and replication of DNA helped to free an innocent man? Replication
	Mar 17	Exam 2
11	Mar 22	Making medications from milk using the genetic code: From genes to proteins
	Mar 24	The race for the human genome and the hope to identify and cure genetic diseases.
12	Mar 29	Recombinant DNA technology
	Mar 31	Gene Therapy and Cloning
13	Apr 5	Gene Expression
	Apr 7	Growing Your Own: Stem Cell and Cell Differentiation.
14	Apr 12	Genetically Modified Organisms
	Apr 14	Natural Selection and Adaptation: Bugs that resist drugs.
15	Apr 19	TBA
	Apr 21	Third Exam
16	Apr 26	Evolution in the Fast Lane
	Apr 28	TBA
17	May 3	TBA
	May 5	Reading Day
18	May 9	Final Take Home Comprehensive Exam From 3:30 to 5:30 PM