MESA COMMUNITY COLLEGE
1833 W. Southern Ave. Mesa, AZ 85202 • 480-461-6220

General Biology I
Biology 212AA
Sections 23867, 23868
Fall 2018

Instructor Contact:

Instructor: Dr. Maurice Jabbour (Ph.D.)
Office: Adjunct faculty lounge
Phone: N/A
Email: mau2133097@mesacc.edu
Office Hours: Mondays: 11am-12pm Or contact me via canvas.
By appointments

Course Description:

BIO 212 AA is Intensive introduction to biotechnology, including media and solution preparation, routine manipulations of DNA, structural properties of DNA, and regulation of gene expression. BIO 212AA transfers directly to NAU as part of a larger transfer agreement with the MCC biotechnology program. The course is also part of the MAPP pathway to ASU for the major Molecular Biology and Biotechnology (MBB).

Course prerequisites and co-requisites:
BIO 181, BIO247, or permission of instructor.

Course Details:

- **Lecture section: 23867**
  Location: LS109
  Days: Monday, Wednesday
  Time: 12:00pm – 1:15pm

- **Lab section 23868**
  Location: LS 109
  Days: Monday, Wednesday
  Time: 1:15pm-4:30pm

Students must be enrolled in 23867 and 23868.

Course Materials:

Textbooks:

Let's Get Smaller- Adventures in Molecular Biology! By Kikkert. Version AUG 2013 (available on Canvas).
Additional handouts provided by Instructor.

Reference Textbooks (Optional):

- **Campbell Biology (Custom MCC Bio 181) (Textbook - Choice) – 11th edition**
  Author: Reece
  Publisher: Pearson Learning Solutions; ISBN: 9781323757130
- ***Brock Biology of Microorganisms 13th edition* (or later), by Madigan**

Online references:

- *Molecular Cell Biology, 4th edition*
  http://www.ncbi.nlm.nih.gov/books/NBK21475/
- *Molecular biology of the Cell, 4th Edition*
  http://www.ncbi.nlm.nih.gov/books/NBK26859/

- **Promega Guide:**
  http://www.promega.com/guides/subcloning_guide/_row/default_row.htm
  links to :
  - Subcloning Notebook
  - Cloning Enzymes
- **NEB Cloning manual:**
  https://www.neb.com/-/media/nebus/files/brochures/cloning_tech_guide.pdf

Canvas: Learning Management System

MCC and other Maricopa colleges use Canvas, an online learning management tool. Course materials should be accessed by students on Canvas
How to access Canvas
https://learn.maricopa.edu/

Student Email

You will need a student email account so that your instructor can communicate with you regarding course work and performance in this class. This is available to all MCC students at no charge. Contact your instructor through your Maricopa email or through Canvas. Emails from accounts other than Maricopa (Yahoo, msn, Hotmail) will go into spam and will delete immediately.
Setting Up Your Maricopa Email

Attendance Policy

- **Lecture:**

Attendance will be taken on the first week of the semester. Students who fail to appear to class on the first day of class will be dropped from class.
Regarding absences during the semester, it is recommended that you consult the instructor by sending an email stating your reasons for not attending class. Failing to show up to class, without notifying your instructor, may result in missing in-class quizzes, in-class announcements, assignments, or exams.

Without notifying your instructor for your absences, you cannot make up for quizzes, in-class assignments, or exams. In addition, below is MCC's policy on excused absences:

> **Excused Absences**
> "Excused" absences, according to MCC's policies include ONLY those due to college sanctioned events or religious observances. Long term medical leave (with documentation) will be excused at the instructor's discretion. Jury duty or subpoenas will be excused with documentation.

- **Laboratory**

Attendance is mandatory. Unlike lectures, labs require hands-on experience and your presence is an essential part of this course. Missing lab sessions without notifying your instructor will result in missing lab quizzes and skill tests. In addition, if you miss a lab, you cannot copy or obtain results from your lab members to use in your lab report.
If you miss three labs, you will receive zero credit for the lab grade, which accounts for 25% of your course grade.

- **Attendance Withdrawal Policy**

If you stop attending this class after the 45th day of the semester, your instructor may award a grade of W, Y, or F depending on your status in the class up until the day you stopped attending. Please discuss any desires to withdraw from the class with your instructor so together you can decide on the best course of action. Withdrawal policy: Students on the class roster wishing to withdraw from the course should consult the Table listed on the right for deadlines. Again, if a student wishes to avoid paying the cost of tuition for this course, students must withdraw themselves before the completion of the first week of instruction.

Refund Eligibility

Students who officially withdraw from credit classes (in fall, spring or summer) within the withdrawal deadlines listed below will receive a 100% refund for tuition, class and registration processing fees. Deadlines that fall on a weekend or a college holiday will advance to the next college workday, except for classes fewer than 10 calendar days in length or as specified by the college. Calendar days include weekdays and weekends. Refer to individual colleges for withdrawal and refund processes.

Note: *Winter Intersession classes are classified as Spring Semester classes for accounting and enrollment purposes.*

Length of Class	Official Withdrawal Deadlines for 100% Refund
1-9 calendar days	Prior to the class start date
10-19 calendar days	1 calendar day including the class start date
20-29 calendar days	2 calendar days including the class start date
30-39 calendar days	3 calendar days including the class start date
40-49 calendar days	4 calendar days including the class start date
50-59 calendar days	5 calendar days including the class start date
60-69 calendar days	6 calendar days including the class start date
70+ calendar days	7 calendar days including the class start date

- **August 27th, 2018**– Withdraw with full refund.
- **October 7th, 2018** – Deadline for students to withdraw with guaranteed grade of "W".

Instructor will withdraw students during Week 1 to remove students who have never attended (W – Withdrew Passing). In the days following Week 1, instructor will withdraw students who have stopped attending class (Y – Withdrew Failing). If a student wishes to withdraw from the course (and receive a W), it's is the student's responsibility to initiate and carry to completion the withdrawal process. **Student initiated withdrawal is permitted until date indicated in your Student Schedule at my.maricopa.edu.**

Any student who stops attending will still receive a grade (most likely an F) for the course. If you stop attending, withdraw from the course to avoid earning a letter grade.

Extra Credit

Any opportunity for extra credit will be given for the whole class. There will be no special extra credit assignments for certain individuals to raise their grades.

Make-up Test and Late Work

Quizzes, lab reports/worksheets, tests, and class assignments are due by the date listed below. If changes do occur regarding assignment due dates, you will be notified in-class.

There is no makeup test or quiz.

Grading

BIO212AA Grade Sheet*

Assignments/tests	Points Possible	Student Score	Grade
	1000pts		
Quizzes (5)	125		
Exam I or midterm	150		
Exam II or Final Exam	200		
Skill tests (3)	120		
Homework : Experimental Strategies (2)	75		
GMO Project (Lab report)	100		
Cloning Project (Presentation and Lab report)	100		
Notebook (4, e-versions)	130		

*Assignments may be modified at the discretion of the instructor.

There are no extra credit assignments to improve grades.

Grades will be assigned as follows:
90-100% = A
80-89% = B
70-79% = C
60-69% = D
59% or less = F

Students are encouraged to keep track of their scores and grade throughout the semester using the **Grade Sheets** included in this syllabus.

Behaving Responsibly And Cooperatively

Part of our purpose in this class is to come together as a community of learners in which ideas are shared and we learn by doing and explaining, not just by watching. Often, you will find that your classmates have different perspectives than you and can offer tips or techniques that can enhance your learning and understanding. You have a lot to learn from the instructor, but you also have a lot to learn from each other. Students are expected to come to class prepared to participate. Remember, none of us is as smart as all of us! Everyone has something to offer. **Students are expected to treat each other and the instructor in a courteous, respectful manner. Public displays of rudeness or immaturity will not be tolerated**. No eating, drinking or smoking is allowed in laboratory rooms. MCC's liability insurance only covers employees and students registered in the class. Therefore, no outside visitors are allowed during class hours under any circumstances.

Academic Integrity

Academic misconduct and dishonesty includes, but is not limited to, cheating, plagiarism, excessive absences, use of abusive or profane language, and disruptive and/or threatening behavior. All instances of academic dishonesty will be reported to the Chair of the Life Sciences Department and other appropriate authorities. Students displaying acts of academic dishonesty are subject to grade adjustment, course failure, probation, suspension, or expulsion. See the student handbook for more information regarding cases of academic misconduct.
Academic dishonesty will result in a zero for that assignment as well as an "F" or "Y" for the course at the instructor's discretion.

Resources

- Academic Support

    i. Learning Enhancement Center:
    Many students find that college coursework provides new academic challenges. Students who wish to deepen their understanding of course concepts, extend their skills, and improve their performance in their course(s) are encouraged to

use the free tutoring and other support services in the Learning Enhancement Center. The LEC Office is located on the 1st floor of the Elsner Library.
Phone: 480.461.7678 Red Mountain: 480.654.7735
Web: www.mesacc.edu/tutoring

ii. Writing Center:

The Writing Center provides one-on-one appointments to help students during any phase of the writing process: brainstorming, prewriting, researching, drafting, and revising. The Writing Center is located on the 1st floor of the Elsner Library. Phone: 480.461.7513.
Web: https://www.mesacc.edu/departments/english/writing-center
*Note: use the tutoring information that is relevant to your course/campus.

iii. Study Lab and Tutoring

There is a Biology Study Lab in NU-157 and below is the schedule:
Monday & Wednesday: 9am - 6:45pm
Tuesday & Thursday: 9am - 7pm
Friday: 9am - 1pm

- Disability Services

If you have a documented disability, including a learning disability, and would like to discuss possible accommodations, please contact the MCC Disabilities Resources and Services Office at 480-461-7447 or email drsfrontdesk@mesacc.edu.
To ensure equal access, all required course materials provided in web links are expected to meet AA Standard of Compliance with the Web Content Accessibility Guidelines (WCAG) 2.0. All internal and external course links should be evaluated by the WAVE Web Accessibility Evaluation Tool. Course materials are expected to be in compliance, or an alternative option provided upon the student's request.
Students with disabilities must have an equally effective and equivalent educational opportunity as those students without disabilities. Students experiencing difficulty accessing course materials because of a disability are expected to contact the course instructor so that a solution can be found that provides all students equal access to course materials and technology.
Information for Pregnant or Parenting Students: If you are a pregnant or parenting student you are protected under Title IX regarding classroom accommodations. Please request your accommodations through the MCC Disabilities Resources and Services Office at 480-461-7447 or email drsfrontdesk@mesacc.edu.

- Veterans

'Any veterans who are not taking advantage of the Veterans Services provided by MCC should contact *veterans@mesacc.edu*. Veterans should also notify their instructors of any special enrollment circumstances (i.e. drop codes) they may have.'

- Early Alert (EARS)

  Mesa Community College is committed to the success of all our students. MCC has adopted an Early Alert Referral System (EARS) to aid students in their educational pursuits. Faculty and Staff participate by referring students to campus services for added support. Students may receive a follow up call from various campus services as a result of being referred to EARS. Students are encouraged to participate, but these services are optional.
  http://www.mesacc.edu/students/ears.

F-1 Students

If you are an F-1 student, I'm so glad that you're in my class! You bring diversity and a world perspective to the classroom, and that helps me to fulfill one of MCC's student outcomes: Cultural and Global Engagement. Please know that you must adhere to the attendance policy that is set for this class and is listed in this syllabus. If you are withdrawn by me for the class for non-attendance, I will not place you back into the class. If you earn a W or Y (for non-attendance) and this brings you below the required 12 credits that you need to maintain your F-1 status in the USA, I will not change your grade to an F. You are given the grade that you earn. If you fall out of status, you can go through a process called "F-1 Reinstatement" with the International Education (IE) Office located in Building 36N. IE regularly sends you messages to your MCC email regarding immigration matters. Be sure to check it regularly! They also check attendance reports for all F-1 students on a weekly basis. You are here in the USA to be a student on your F-1 full time study visa, and we'll help you to maintain that status.

College-Wide Online Students Course Survey

Near the end of this course, you may receive an invitation to complete a course survey via Canvas and your MCC email. Your constructive feedback plays an important role in shaping the quality education at MCC. All responses are completely confidential, and your name is not stored with your answers in any way. In addition, instructors will not see results from the survey until after final grades are submitted. Your participation is greatly appreciated. The course survey is only given in some MCC courses, so you may not receive a survey in all courses.

Statement of Student Responsibilities

It is your responsibility to understand the policies listed in this syllabus as these are the guidelines that your instructor will follow for grading, attendance, etc. It is also your responsibility to read and understand the college policies included in the student handbook as they may apply to you in the case of an incomplete grade, withdraw for failure to attend, etc.
MCC Student Handbook

Policy on Cell Phones and other Devices in Class

Texting in Class: Texting or other uses of personal wireless devices is not permitted during any in-class assignment. This includes lecture and lab quizzes, lecture exams, or other activities. Texting is not permitted at all in the laboratory. *All cell phones must be placed on table top and visible during examination.*

You are not allowed to use your cell phones or any digital device to record videos of the lectures. Also, audio recording of the instructor without notifying the instructor is not permitted. At the discretion of the instructor, you are allowed to take photos of notes written on the whiteboard.

Recommendations For Academic Success

For every hour you spend in class, you should spend at least two (2) hours outside of class studying the material and completing your assignments. For example, if you take a class one (1) hour a day, three days a week, you should devote at least **6 hours** a week outside of class.

Students do not fail at the end of the semester. If a student is failing in the last week, it is because of what he or she has done throughout the semester. Keep up with the work. Keep track of your points and percentage in the class. Keep track of assignment due dates on the course calendar. Remember, you cannot complete all the assignments in the last few days of the semester.

Institutional Learning Outcomes: MCC's 4Cs

Our goal at MCC is to excel in teaching and learning. We are here to empower individuals to succeed in their local and global community. As part of this commitment, Institutional Student Learning Outcomes (iSLOs) have been created with the goal of embedding educational experiences in all MCC courses. ISLOs are skills and knowledge students attain through courses and experiences. Students who complete a degree, program or certificate will know they leave MCC with these skills or knowledge. MCC's iSLOs are known as MCC's 4Cs. They are Critical Thinking, Communication, Civic Engagement, and Cultural and Global Engagement.

Visit Student Learning Outcomes for more information.

Learn and Earn: Do you have a 3.5 GPA? Read on!

The Honors Achievement Award is open to students who have completed 12 college-level credits within the Maricopa Colleges and have a minimum cumulative GPA of 3.25. If this is you, apply to the Honors Program at Mesa Community College. To be awarded funds, you must be enrolled in at least 6-graded credits, including one 3-credit honors class, complete the honors class with at least a "C" grade, and participate in one co-curricular activity during the semester. Any student who qualifies for this award should contact the Honors Office at 461-7079, Kirk Center 35S (Southern and Dobson) or 654-7821, Desert Willow (Red Mountain). More information on the program and eligibility can be found at: https://www.mesacc.edu/honors/honors-achievement-award-scholarship

BIO 212AA COURSE SCHEDULE*

*This schedule is subject to change at the discretion of the instructor.

Wk	Date	Lecture Topic	Laboratory
1	M Aug 20th	• Syllabus • Lab notebook (e-version using OneNote) • Significant Figures and Scientific Notations	Lab Safety and lab tour Use of Micropipettes Practicing Calculations
1	W Aug 22nd	• Calculations for Molecular Biology • Preparation of solutions • pH and use of pH meter	Preparation of reagents for making chemi-competent bacteria Preparation of bacterial media
2	M Aug 27th	• **Quiz1 – Calculations for Molecular Biology** • Introduction to Biotechnology • Use of Bacteria in Biotechnology • Cell biology of bacteria (overview) • Transformation and competency	**Use of Micropipettes – Skill Test (Graded)** Aseptic techniques for subculturing Streak for Isolation (1) Preparation of LB broth
2	W Aug 29th	• Bacterial Growth Curve • Factors affecting bacterial growth (Aeration, temperature, pH etc.) • Optical density and bacterial enumeration • Chemical approach to making competent cells	Preparation of Chemi-Competent Cells (Batch 1) Steak for isolation (2)
3	**M Sep 3rd**	**Labor Day holiday – Campus closed**	
3	W Sep 5th	• **Quiz 2 – Cell Structure, bacterial Growth, and Biotechnology** • Methods for Transforming bacteria : o Chemical transformation o Electroporation	**Streak for isolation – Skill test (Graded)** Preparation of Chemi-Competent Cells (Batch 2)
4	M Sep 10th	• DNA - Structure and Function • Recombinant DNA and Biotechnology	Preparation of Chemi-Competent Cells (Batch 3) Preparation of LB Agar plates (with and without antibiotics) **Lab notebook Due (1)**

4	W Sep 12th	• Plasmid Biology	Transformation test #1 Using pUC19, pBR322, or pMIG.mK3
5	M Sep 17th	• Plasmid Biology Continued	Evaluate Transformation efficiency (Batch 1) Prepare Mini-prep reagents Preparation of LB + Antibiotic (1.5 mL)
5	W Sep 19th	• **Quiz 3 – DNA structure and function, plasmid biology, and transformation** • Isolation of Plasmid DNA – Mini-prep technique	Transformation (2) Pick colonies for mini-prep
6	M Sep 24th	• DNA analysis and quantitation • Beer's law • Spectrophotometry	Assess transformation efficiency (batch 2) Mini-Prep (1) Pick colonies (2)
6	W Sep 26th	• Standard curve for quantifying DNA • Restriction endonucleases	**Compile Competent Cells Data** Mini-Prep (2) Quantify Mini-Prep (1) **Lab notebook Due (2)**
7	M Oct 1st	• Gel Electrophoresis (open vs supercoiled plasmid) • Online tools for restriction digest mapping (NEB tools) • **Exam 1 review**	Restriction Digest (1) Quantify Mini-Prep (2) Gel Electrophoresis
7	**W Oct 3rd**	**Exam 1 – Lectures from Aug 20th – Sep 26th**	
8	M Oct 8th	• Manipulation of DNA - DNA modifying enzymes	Restriction Digest + Gel Electrophoresis (batch 2) Compile Restriction digest data
8	W Oct 10th	• Cloning Strategies – Part 1	**Restriction digest and gel electrophoresis – Skill test (graded)** Experimental design – Cloning Project

9	M Oct 15th	• Cloning Strategies- Part 2 • Introduction to PCR	**Cloning Project: Experimental Outline Due (Graded)** Plasmid mapping and constructs – Online tools
9	W Oct 17th	• **PCR continued** • **Quiz 4 – DNA modifying enzymes and cloning strategies**	Primer design and PCR Practice PCR using pGLO or pEGFP to amplify GFP.
10	M Oct 22nd	• PCR continued • GMOs	Genomic DNA extraction from food
10	W Oct 24th	• GMOs – Advantages and disadvantages	PCR of DNA isolated from plants and GMO foods
11	M Oct 29th	• Biotechnology for medical applications	Restriction digest of GMOs and analysis of food samples
11	W Oct 31st	• Cloning Project – Overview and background on viral gene being cloned.	Completion of GMO project Start Cloning Project Setup a flow chart Prepare reagents for Cloning Project **Lab notebook Due (3)**
12	M Nov 5th	• Gene regulation in Bacteria and Eukaryotes	**Cloning Project:** PCR of mK3 using provided primers **GMO Lab report is Due**
12	W Nov 7th	• Gene regulation in Bacteria and Eukaryotes	**Cloning Project:** Purification of PCR products for cloning Gel electrophoresis
13	**M Nov 12th**	• **Holiday - Veterans Day**	
14	W Nov 14th	• Example of Gene regulation: Gene editing – CRISPR	**Cloning Project:** Restriction digest of PCR and Plasmid using cloning enzymes Setup ligation

14	M Nov 19th	• Gene editing – CRISPR	**Cloning Project:** Transformation of E. coli
14	W Nov 21st	• DNA sequencing – Current techniques	**Cloning Project:** Mini culture and Minipreps
15	M Nov 26th	• Bioinformatics tools for DNA sequence analysis	**Cloning Project:** Restriction digest to asses cloning of insert
15	W. Nov 28th	• **Quiz 5 – GMOs, Gene regulation, CRISPR, and DNA sequencing** • Bioinformatics tools for DNA sequence analysis	**Cloning Project:** Agarose gel electrophoresis
16	M Dec. 3nd	• Bioinformatics tools for DNA sequence analysis	**Cloning Project:** Finish Cloning Project Lab Cleanup
16	W Dec 5th	• Review for Exam #2 or Final exam	**Cloning Project:** **Presentation of cloning project** **Lab report on Cloning project is Due** **Lab notebook (4)**
17	**W Dec 12th**	• **Exam 2 or Final Exam – Cumulative, 12-4pm**	