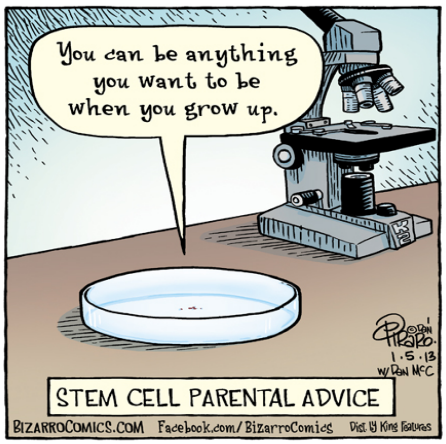
Seminar in Molecular biology techniques



Course Description:

This is a one-semester integrated course that is designed to give students in their senior year a unique experience in exploring the field of molecular biology. This class has a significant laboratory component that will give students the opportunity to carry out a variety of molecular techniques, such as cloning, PCR, tissue culture, immunohistochemistry and bioassays. In addition lab work, students will be researching molecular techniques and presenting primary journal articles that used them.

Teacher	Email	Office	Phone
Dr. Sowmya Anjur	sanjur@imsa.edu	B159	X5941
Dr. Crystal Randall	Crandall@imsa.edu	B161	X5039

Office Hours: TBA

Reading materials: Students will use recently published research papers in molecular biology which will be selected with the help of the instructor from peer-reviewed science journals, science magazines, or scholarly sources on the internet.

Student Learning Objectives (SSLs and Outcomes):
IA= Informally Assessed; FA=Formally Assessed

- To enhance student learning and understanding in the following areas: data acquisition and analysis, experimental design, written and oral communication, using inquiry to analyze and understand structure-function relationships, and relating concepts studied in the classroom to real life situations.

- To develop students' skills and levels of understanding and proficiency in the following Standards of Significant Learning (SSLs):
    - IB (construct meaningful questions that advance learning)
      This is done by analyzing data to draw conclusions and relate it to the concepts. **FA**

    - IC (observe precisely and record accurately)
      This is done through laboratory observations, data collection and analysis. **FA**

    - ID (critically evaluate information and reasoning)
      This is done by drawing conclusions from laboratory data. **FA**

    - IIIA (use appropriate technologies as extensions of the mind)
      This is done by the use of computers and calculators. **IA**

    - IIIB (find and explain connections among things and ideas)
      This is done by making historical connections to the scientists as well as relationships to everyday phenomena. **FA**

    - IVA (construct and support judgments based on evidence)
      This is done by laboratory exploration, constructing laboratory reports as well as identifying unknown compounds based on previous learnings. **FA**

    - IVB (write and speak with power, economy and elegance)
      This is done through lab reports, demonstrating understanding through discussions and oral presentations. **FA**

    - IVC (recognize the parts that make up complex wholes)
      This is done by applying basic naming and reaction properties to more complex molecules. **FA**

    - V (make reasoned decisions which reflect ethical standards, and act in accordance with those decisions.
      This is done by not manipulating data to fit conclusions and preventing plagiarism in lab reports. **FA**

Specific Assessments and Their Respective Point Values

Students will work in pairs for maximum efficiency. Each group of students will be responsible for a series of 7 poster presentations. In addition to these presentations

each pair of students will work on a semester long laboratory project. This assignment will include a project proposal, lab notebook, and final lab report.

Graded course work will include

- 4 Quizzes (bio-safety, cloning, tissue culture, molecular techniques)
- Technique presentations – with written summary (turnitin.com)
- Class participation
- Lab notebooks
- Project proposal
- Final lab report

Student Expectations

Each student enrolled in the seminar course on molecular biology will:

1) bring a laptop computer to class every day,
2) complete all reading assignments on time
3) give presentations
4) write a project proposal
5) keep an organized lab notebook including procedures and results
4) actively participate in all class discussion sessions by asking or answering questions or sharing relevant comments and information,
5) complete all assignments and homework by the specified deadlines
6) arrive to class on time and prepared for each day's activities.
7) follow all safety guidelines while working in the lab, such as wearing closed toed shoes and safety goggles

*LATE WORK: A 10% penalty will be deducted from the total points earned for each day late for up to three calendar days from original due date.

[Note: Please review the Academy's attendance and tardiness procedures described in the Student Handbook. These procedures will be strictly enforced.]

Important: Students should also regularly check their email and Moodle for course-related information and materials. This might include schedule updates, reading assignments, class handouts, supplements to class discussions, information about upcoming assessments, work for students to complete in the event of a teacher absence, etc.

Grading

Letter grades at the end of the semester will be assigned as follows:

Letter Grade		Average*
A	=	90-100%
B	=	80-89.99%
C	=	70-79.99%
D	=	below 70%

Note: The content and sequence of this syllabus is subject to change at the instructor's discretion at any time as necessary

Dates	Week	Class Activity
August	20-24	Intro to class and syllabus: lab safety tutorial, start research on cloning techniques and protocol design
August	27-31	Safety quiz cloning presentations/ Restriction digest mapping
September	4-7	Lambda cloning Project proposal design/protein functions
September	10-14	Lambda cloning/ protein functional assay presentations
September	17-21	Project proposal work/ Protein localization research
September	24-28	Lab /Protein localization Presentations
October	1-5	Lab gene regulation research
October	9-12	Lab/ gene regulation presentations
October	15-19	Lab / Protein interactions research
October	22-26	Lab/ protein interactions presentations
November	5-9	Intro to tissue culture/ techniques that show cell survival research
November	12-16	Tissue culture quiz/ cell survival techniques presentations
November	19-20	Cell survival assays
November	26-30	Cell survival assays
December	3-7	Molecular techniques quiz/Paper presentations
December	10-14	Paper presentations- Final lab report
December	17	TBA