BIO-2070: TECHNIQUES IN MOLECULAR GENETICS

Cuyahoga Community College

Viewing:BIO-2070 : Techniques in Molecular Genetics
Board of Trustees:
1997-10-23

Academic Term:
2001-08-23

Subject Code
BIO - Biology

Course Number:
2070

Title:
Techniques in Molecular Genetics

Catalog Description:
Advanced study of structure and function of DNA with emphasis on laboratory
techniques used in molecular biology. Laboratory practices and applications
of sterile techniques, gel electrophoresis, DNA isolation, RFLP analysis, plasmids, and recombinant DNA. Protein structure and
methods of protein purification explored.

Credit Hour(s):
3

Lecture Hour(s):
1

Lab Hour(s):
4

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
BIO-1040 The Cell and DNA, or BIO-2341 Anatomy and Physiology II, or BIO-1500 Principles of Biology I.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded
for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of
the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one
(1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is
required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of
two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of
out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other
hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to
receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at
the beginning of the syllabus. The number of credit hours for lecture, lab and other hours are listed at
the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will
enhance your success in this course.
The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor
within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the
Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.
III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts.

Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have "Never Attended" a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

 Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available athttp://www.tri-c.edu/student-resources/documents/studenthandbook.pdf. You must also comply with the College’s Zero Tolerance for Violence on College Property available athttp://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf
Outcomes
Objective(s):
1. Describe in detail the structure of DNA.
2. Recognize the importance of bacterial DNA in molecular genetics.
3. State the applications of various DNA technologies in agriculture, medicine, industry, and forensics.
4. Describe the relationship between DNA and protein synthesis.
5. Recognize the importance of protein function and perform various methods of protein separation and purification.
6. Identify the bioethical consequences of DNA technologies.
7. Locate and use current genetic information such as journal articles, the Internet, and technical newsletters.
8. Demonstrate sterile technique.
9. Use laboratory methods to isolate DNA.
10. Apply gel electrophoresis technique to RFLP analysis.
11. Use plasmids to obtain recombinant DNA.
12. Analyze the components of a karyotype.
13. Select and perform a laboratory investigation.

Methods of Evaluation:
1. Examinations
2. Written review of current genetic information
3. Quizzes
4. Laboratory reports
5. Presentation of laboratory investigation

Course Content Outline:
1. Structure and function of DNA
2. Bacterial DNA
   a. E. coli
   b. Plasmid
   c. Recombinant DNA
3. DNA technologies
   a. Sterile technique
   b. DNA isolation
   c. DNA fingerprinting
   d. Recombinant DNA
   e. Karyotyping
4. Applications of DNA technologies
   a. Agriculture
   b. Medicine
   c. Industry
   d. Forensics
5. Proteins
   a. Protein synthesis
   b. Protein function
   c. Methods of purification
   d. Methods of analysis
6. Bioethics
7. Careers in molecular genetics

Resources


"BioScience"

"Genetic Engineering News"

"Nature"

"Science"

"Scientific American"

"The Scientist"

Resources Other

1. Internet.
2. Technical Newsletters (Edvotech).

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