

Term Information

Effective Term Spring 2014

General Information

Course Bulletin Listing/Subject Area Molecular Genetics
Fiscal Unit/Academic Org Molecular Genetics - D0340
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 4501
Course Title General Genetics Laboratory
Transcript Abbreviation GenGeneticsLab
Course Description MolGen 4501 Laboratory complements the MolGen 4500 lecture course. It provides a laboratory experiences in a wide range of molecular genetic laboratory techniques and approaches, and utilization of relevant genetic model systems.
Semester Credit Hours/Units Fixed: 1

Offering Information

Length Of Course 14 Week, 7 Week, 4 Week (May Session)
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Laboratory
Grade Roster Component Laboratory
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites Prereq or concur: 4500 or 4500E, or permission of instructor.
Exclusions Not open to students with credit for 5601 (601) or 5602 (602)

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 26.0804
Subsidy Level Baccalaureate Course
Intended Rank Junior, Senior

Quarters to Semesters

Quarters to Semesters

New course

Give a rationale statement explaining the purpose of the new course

The course provides an optional new laboratory experience for students who are enrolled in, or have completed, MolGen4500 (General Genetics).

Sought concurrence from the following Fiscal Units or College

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students can utilize core molecular genetic laboratory techniques/approaches.
- Students appreciate the relevance and use of model systems in the context of genetic research
- Students have a basic understanding of relevant bioinformatics approaches

Content Topic List

- Isolation and manipulation of nucleic acids
- PCR in DNA amplification and manipulation
- DNA sequencing
- Generation of recombinant molecules
- Bacterial Transformation
- Protein expression
- Gene expression
- Model systems
- Population genetics

Attachments

- MolGen4501-NewCourseRequest.pdf: Departmental letter
(Cover Letter. Owner: Vaessin, Harald Emil Friedrich)
- MolGen 4501.pdf: Course description
(Other Supporting Documentation. Owner: Vaessin, Harald Emil Friedrich)
- MG4501 Syllabus.pdf: Syllabus
(Syllabus. Owner: Vaessin, Harald Emil Friedrich)

Comments

COURSE REQUEST
4501 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette
Chantal
04/16/2013

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Vaessin, Harald Emil Friedrich	04/13/2013 08:35 PM	Submitted for Approval
Approved	Vaessin, Harald Emil Friedrich	04/13/2013 08:36 PM	Unit Approval
Approved	Hadad, Christopher Martin	04/16/2013 12:34 PM	College Approval
Pending Approval	Nolen, Dawn Jenkins, Mary Ellen Bigler Vankeerbergen, Bernadette Chantal Hogle, Danielle Nicole Hanlin, Deborah Kay	04/16/2013 12:34 PM	ASCCAO Approval



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April 12, 2013

Curriculum Review Committee:

The Molecular Genetics Department is proposing a new laboratory course, MolGen 4501 General Genetics Laboratory, which will provide additional learning opportunities for the clientele of our major service course, MolGen 4500 General Genetics. MolGen 4500 is taken by ~1,100 life science majors each year. It is a 3 credit-hour course that consists of three 55-min lectures per week and is taught in autumn, spring, and summer semesters with multiple sections in both autumn and spring.

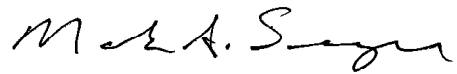
This new course, MolGen 4501, is designed to offer an optional laboratory experience for students who have completed or who are concurrently enrolled in MolGen 4500. We feel this laboratory class will enhance fundamental concepts taught in MolGen 4500, provide practical experiences with modern molecular genetics techniques, data collection and analysis, and provide hands on experiences that are desired by graduate programs, professional schools, and future employers. It will be a one credit-hour class that will meet for a single 3-hour laboratory per week. The optional nature of this course is important, since many students may gain similar experiences through undergraduate research experiences and others may feel that the time required for this experience does not fit with their overall academic schedule or plans.

We plan for a limited offering in spring 2014 with two to three sections of 24 students each. Once established, we envision offering multiple sections of this lab all three semesters. High demand is expected for this class. Students have asked about laboratory options associated with our General Genetics class for many years. Polling of current MolGen 4500 students indicates that 28% of students are “very interested in this laboratory course” and an additional 32% “moderately interested”. If only a third of MolGen4500 students pursued enrollment in this course, we would have ~ 150 students seeking enrollment in both autumn and spring semesters. Recent increases in Molecular Genetics faculty FTEs allows us to offer this course with existing faculty. If demand for the course is high beyond spring 2014, we will need to secure additional GTA positions during the annual departmental budget discussions with the Dean. Molecular Genetics controls several teaching labs in Jennings. We can accommodate this proposed course in available space without negatively impacting other courses, like

MolGen 1101, 3300, and 5643, that also utilize these teaching laboratories. We will request a laboratory fee be required for this course to help defray expenses for the supplies associated with hands on experience in molecular genetics techniques.

We seek your approval so that this new course can be offered in spring 2014.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark A. Seeger". The signature is written in a cursive style with a large, stylized initial "M".

Mark A. Seeger, Ph.D.
Associate Professor
Associate Chair
Department of Molecular Genetics

Syllabus (DRAFT)

Molecular Genetics 4501, General Genetics Laboratory Spring 2014

Rm xxx, Jennings Hall
Laboratory time: TBD (3 hours 1day/week)

Instructors	Contact Information
TBN	XXXXX
TAs	Contact Information
TBN	XXXXXX

Course Description

This laboratory course will provide students with a laboratory experience in the application of current molecular genetic techniques to study nucleic acids, transmission and molecular genetics, gene expression, bioinformatics and biotechnology. The mastery of these techniques and approaches provide the core learning objectives of this course. At the end of this course students will be able to use current molecular genetic laboratory techniques, utilize bioinformatics tools to analyze genetic experimental data, and understand the use of model systems to address genetic research problems. The material covered in this course complements and enhances the understanding of material covered in MolGen 4500.

Carmen

The Laboratory Manual as well as any additional supplemental reading material can be downloaded as PDF files from the Carmen course web site. Each student enrolled in MolGen 4501 will have access to the website for the course, and you are expected to check there regularly for handouts, PowerPoint files, and announcements about the course. You are responsible for obtaining the Laboratory Manual before the Week 2 laboratory session. Handouts will **not** be

available in the laboratory. Therefore, print your copy, or use your laptop to access the Laboratory Manual.

Course Structure

The course will meet one day per week for 3 hours to complete the scheduled **experiments** for each session. Before the start of each session a short introduction will be presented that outlines the experimental work to be accomplished during each session, as well as to provide some theoretical background. As we have only a limited amount of time to complete the scheduled experiments, it is essential that students are not late for sessions.

Additional presentations/discussions will take place during experimental “down-time” (e.g. incubation periods etc.), in order to provide additional background and to address questions.

Individual experiments may extend over several sessions. Labbooks must be kept by each student to record and document the work accomplished. The Labbooks will be graded at the end of the term. At the conclusion of each experiment set, a typed report will be submitted. Deadlines for the submission of these Lab Reports will be posted. The deadlines for reports are absolute.

Office for Disability Services:

If you need an accommodation based on the impact of a disability, you should contact the instructor to arrange an appointment as soon as possible. At the appointment we can discuss the course format, anticipate your needs and explore potential accommodations. We rely on the Office For Disability Services (ODS) for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the ODS, we strongly encourage you to do so as soon as possible. Any student currently registered with the ODS and taking exams at ODS will need to provide the MG4500 instructor with the ODS proctor sheets during the first week of class for completion.

Academic Misconduct:

All instructional faculty and staff are required by The Ohio State University to forward all cases of suspected academic misconduct to the Committee on Academic Misconduct. Any form of academic misconduct, no matter how seemingly small, will not be tolerated in this course. Students are expected to abide by the Code of Student Conduct and the university's honor code as outlined in the University Student Handbook or suffer the consequences.

Grades:

Grades will be calculated as following:

Reports:	40%
Labbook:	20%
Final Exam:	40%
Total	100%

<u>93 – 100: A</u>
<u>90 -< 93: A-</u>
<u>85 -< 90: B+</u>
<u>80 -< 85: B</u>
<u>75 -< 80: B-</u>
<u>70 -< 75: C+</u>
<u>65 -< 70: C</u>
<u>60 -< 65: C-</u>
<u>55 -< 60: D</u>
<u>-< 55: E</u>

Schedule of Topics

- Week 1: Introduction, review of laboratory rules and organizational issues.
- Week 2: Amplification and cloning of DNA into bacterial vectors, transformation
- Week 3: Isolation and manipulation of DNA
- Week 4: DNA sequence analysis
- Week 5: Recombinant protein expression
- Week 6: Qualitative and quantitative analysis of recombinant products
- Week 7: Gene expression I
- Week 8: Gene expression II
- Week 9: *in situ* Analysis of gene expression
- Week 10: Use of model systems to analyze developmental processes I
- Week 11: Use of model systems to analyze developmental processes II
- Week 12: Genomics
- Week 13: Population genetics
- Week 14: Final Exam

MOLECULAR GENETICS 4501

Course Description

This new, one credit hour laboratory course will provide MolGen 4500 students with an optional laboratory experience in the application of current molecular genetic techniques and approaches to study nucleic acids, transmission and molecular genetics, gene expression, bioinformatics and biotechnology. At the end of this course students will be able to use current, broadly employed molecular genetic laboratory techniques and bioinformatics tools to analyze genetic experimental data, and understand the use of model systems to address genetic research problems. The material covered in this course complements and enhances the understanding of the material covered in MolGen 4500. Molecular Genetics 4501 is an optional laboratory course for students enrolled in Molecular Genetics 4500. Concurrent or recent enrollment in MolGen 4500 is a requirement for enrollment in MolGen 4501. However, students enrolled in MolGen 4500 are NOT required to enroll in MolGen 4501. While the material covered in MolGen 4501 complements and enhances the material/topics covered in MolGen 4500, enrollment in MolGen 4501 is not necessary to be successful in MolGen 4500.

Learning Objectives:

Upon completion of the course, students can utilize core molecular genetic laboratory technique and approaches, appreciate the relevance and use of model systems in the context of modern molecular genetic research, and have a basic understanding of relevant bioinformatics approaches. Further, the techniques learned in this course would serve as a foundation for those students seeking employment in laboratory research positions that utilize these methods.

Assessment:

To determine how well students will be able to reach the Learning Objectives for the course we will utilize embedded questions, grading rubric subcategories for lab book and lab report analysis, as well as direct student feedback collected via an exit questionnaire. The instructors will utilize these data to make any potentially necessary adjustments in the course delivery and structure.

Laboratory Space

MolGen 4501 will be taught in our Jennings laboratories (either room 014 or 024 Jennings) in parallel sessions of not more than 24 students per session. The laboratory space is under scheduling control of the Department of Molecular Genetics.