Master Syllabus

Administrative Unit: Science Department

Course Prefix and Number: BIOL 342L

Course Title: Genetics Laboratory

Number of: Credit Hours: 2 Lecture Hours: 0 Laboratory Hours: 2

Catalog Description: Laboratory experiences to complement BIOL 342; methodology and applications in classical and molecular genetics. $20 lab fee. Concurrent enrollment in BIOL 342 is required. Students majoring in Biology must earn a grade of C or better. Prerequisites: BIOL 110 and sophomore standing.

Prerequisite(s)/Corequisite(s): BIOL 110 and sophomore standing.

Text(s): Recommended types of texts: textbooks listed are not necessarily the textbook(s) used in the course.


Course Objectives:

- To use the scientific method to design and conduct experiments.
- To use critical analysis skills to interpret data and draw conclusions.
- To perform and evaluate methods in classical genetic analysis using bacterial, plant, animal and fungal organisms.
- To employ and evaluate methods in molecular genetics.

Measurable Learning Outcomes:

- Perform and analyze monohybrid and dihybrid crosses using experimental organisms.
- Describe and appropriately use probability and Chi-square analysis.
- Outline the events of mitosis and meiosis.
- Demonstrate differences and similarities in meiosis of plants and animals.
- Isolate DNA.
• Use appropriate laboratory methods and equipment for genetic studies.
• Discriminate between single gene and polygenic inheritance.
• Apply principles of population genetics.

Topical Outline (major areas of coverage):
• Monohybrid and dihybrid crosses.
• Genotypic and phenotypic ratios.
• Probability and Chi-square analysis.
• Cell reproduction: mitosis and meiosis.
• Linkage, crossing over, chromosome mapping.
• Mutation and complementation.
• Human genetics, pedigrees and polygenic inheritance.
• DNA isolation, purification and restriction enzyme mapping.
• Gene expression and protein synthesis in bacteria and yeast cells.

Recommended maximum class size for this course: 25

Library Resources: Online databases are available at http://www.ccis.edu/offices/library/resources.asp. You may access them from off-campus using your eServices login and password when prompted.

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NOTE: The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

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