

FLORIDA ATLANTIC UNIVERSITY™

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Graduate Programs—NEW COURSE PROPOSAL¹

DEPARTMENT: **BIOLOGICAL SCIENCES**

COLLEGE: **CHARLES E. SCHMIDT COLLEGE OF SCIENCE**

RECOMMENDED COURSE IDENTIFICATION:

PREFIX BSC COURSE NUMBER 6468 LAB CODE (L or C) L

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: **METHODS IN BIOTECHNOLOGY**

EFFECTIVE DATE

(first term course will be offered)

 SPRING 2015

CREDITS²: **3**

TEXTBOOK INFORMATION: **METHODS IN BIOTECHNOLOGY LAB MANUAL**, PROVIDED VIA BLACKBOARD

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR X SATISFACTORY/UNSATISFACTORY _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES:

The overarching objective of this laboratory course is to provide students with hands-on experience in some of the basic, but essential laboratory skills required in molecular biology and biotechnology. Emphasis will be placed on understanding the concepts behind designing and implementing controlled experiments. These techniques involve manipulation of DNA, RNA and protein. These skills are directly transferable to the workplace.

PREREQUISITES*:

ALL STUDENTS MUST HAVE TAKEN UNDERGRADUATE LEVEL GENETICS PCB 3063 WITH A GRADE OF B- OR BETTER, OR AN EQUIVALENT COURSE – AS EVALUATED BY THE INSTRUCTOR

COREQUISITES*:

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:

STUDENTS MUST BE GRADUATE LEVEL

STUDENTS MUST OBTAIN PERMISSION OF INSTRUCTOR PRIOR TO REGISTRATION

* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: SPECIALIZATION IN THE PERTINENT FIELDS, CONTINGENT UPON DEPARTMENTAL APPROVAL

Faculty contact, email and complete phone number:
 David Binninger, Ph.D.
BINNINGE@FAU.EDU
 (561) 297-3323

Please consult and list departments that might be affected by the new course and attach comments.³
 Department of Biological Sciences: This course was previously a Special Topics class and needs a new course number.

Approved by:

Department Chair: 

College Curriculum Chair: _____

College Dean: _____

UGPC Chair: _____

Graduate College Dean: _____

UFS President: _____

Provost: _____

Date:

 04.01.14

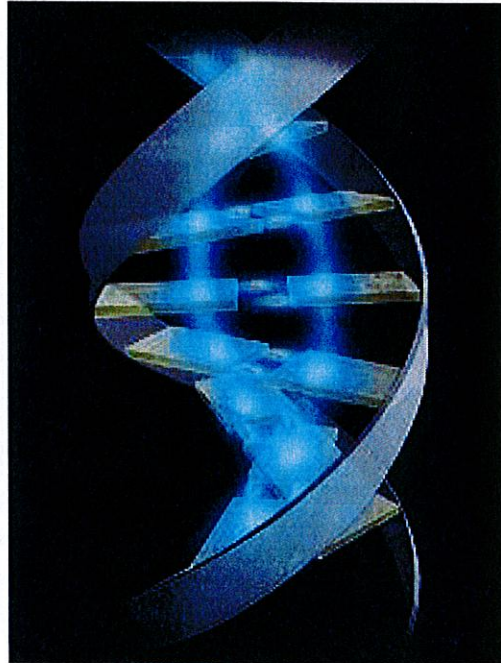
1. Syllabus must be attached; see guidelines for requirements:
www.fau.edu/provost/files/course_syllabus.2011.pdf

2. Review Provost Memorandum: **Definition of a Credit Hour**
www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf

3. Consent from affected departments (attach if necessary)

Email this form and syllabus to UGPC@fau.edu **one week before** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

Methods in Biotechnology
BSC 6468- 001 CRN 25904 (3 credits)
Spring 2015



Course Prerequisites

Permission of instructor

Course Logistics

The course will meet in SC 107 and SC 108. The course is offered in a fast-track format. By meeting for 8 hours per week (Tues. and Thurs. from 8:00-11:50AM), the *Biotechnology 2 Lab* will begin when we return from Spring Break. This allows students to take both lab courses in one semester in the sequence in which they were designed.

Announcements, assignments, the lab manual, etc. will be available on Blackboard.

Instructor:

David Binninger, PhD

Office: Biological Sciences Building; Sanson Science; Room 210

Office Hours: Monday and Wednesday from 10:00AM-12:00PM or
by appointment

Phone: 297-3323

Email: binninge@fau.edu



E-mail is the most effective way of reaching me

Teaching Assistant

The teaching assistants for the course will be William Hausman (whausma1@fau.edu) and Justin Minnerly (jminnerl@fau.edu)

Course Objective and Student Learning Outcomes

The overarching objective of this laboratory course is to provide students with hands-on experience in some of the basic, but essential laboratory skills required in molecular biology and biotechnology. Emphasis will be placed on understanding the concepts behind designing and implementing controlled experiments. These techniques involve manipulation of DNA, RNA and protein. These skills are directly transferable to the workplace.

Required

1. Laboratory notebook, which is available in the FAU campus bookstore in the textbook section. It has a very colorful cover, numbered pages and carbonless tear-out pages.

2. Laboratory manual, which can be downloaded from Blackboard.
3. **Lab coat and safety goggles**

Student Conduct

All rules and regulations regarding the student's responsibilities, discipline and honor code, as outlined in the college catalog, will be observed.

Holidays

There are no official university holidays that coincide with a scheduled class since the course ends just prior to Spring Break.

Course Evaluation

Notebook and Results — 20%

Quizzes — 10%

Five out-of-class assignments — 5% each for a total of 25%

Lab Practical — 15%

Three written exams — 10% each for a total of 30%

In-Class Written Exams

There will be three in-class written exam that accounts for **30% of your course grade**. These are short answer and problem-based exams, which emphasize the concepts and important technical aspects of the techniques that you are learning in this course. A major portion of the exam will focus on the various types of routine calculations required for preparation of reagents.

Important: Many students find the exams challenging and their exam scores are often a major factor in determining the final course grade. There are discussions throughout this manual on the conceptual and technical details of the procedures you are learning. There will also be discussions in class. This material forms the basis of the written exams.

Exam 1 is February 3rd, 2015
Exam 2 is February 28th, 2015
Exam 3 is April 30th, 2015

Lab Practical

This purpose of the lab practical is to evaluate the lab skills that you have been learning in both the Biotechnology 1 Lab and Biotechnology 2 Lab courses. These are basic lab techniques that are commonly used in a wide range of biomedical research labs. There will be 6-7 stations and you will have a specified amount of

time to complete each station. You should focus on honing your skills so you can move smoothly and efficiently through each assignment.

Lab Practical is April 23rd, 2015

Bioinformatics Assignments

These out of class assignments are designed to provide the student with an introduction to using DNA and protein databases.

Assignment 1 will be due on January 22, 2015

Assignment 2 will be due on February 5, 2015

Assignment 3 will be due on February 26, 2015

Assignment 4 will be due on April 2, 2015

Assignment 5 will be due on April 23, 2015

Laboratory notebook

The laboratory notebook must be purchased from the FAU bookstore. The notebook has carbonless pages that will be torn out and turned into your TA before you leave the laboratory. These pages must be well thought out and legible. We will be going over, in detail, what is expected of you in this record-keeping process. See pages 8-9.

Quizzes

Unannounced quizzes will be given at the beginning of the class. Collectively, the quizzes account for 10% of your grade.

A Clean Working Environment

Now is the time to develop good laboratory techniques that include keeping your lab space clean and organized. Please note that “your mother doesn’t work here”. The following is a list of “behaviors” which will result in a 1-point deduction in your “notebook” grade.

- “Disappear” for extended periods of time
- Leaving trash in the sink
- Not cleaning up properly
- Negligence and/or abuse of equipment
- Questions that clearly indicate that you are not prepared
- Non-participation (your lab partner(s) are doing all of the work)

Results

At this stage in your academic career, it is reasonable to expect an acceptable level of proficiency in the laboratory. The instructor, along with the teaching assistant, will evaluate the quality of your work.

Late for Class

You are expected to be in the lab, ready to work promptly at 8AM. *If you are late, there will be a 1-point penalty on your final course average.*

Missed Lab Periods

It is important that you attend every lab. Most of the experiments will develop over a course of several lab periods. ***Making-up a missed lab is not practical!***

An absence from lab will be allowed only in truly exceptional circumstances and a written, verifiable excuse is provided. Examples of acceptable excuses include a doctor's note showing illness, court subpoena or a family tragedy. If you are going to miss (or have already missed) a lab and have a written excuse, please talk with Dr. Binninger as soon as possible. For an excused absence, you will be offered an opportunity to receive credit for the missed lab by doing an out-of-class written assignment. Please see Dr. Binninger for additional details. Note that in keeping with FAU policy, reasonable accommodations for religious observances will be made.

Unexcused absences will result in lose of all points associated with that day's activities.

Ensuring Success in the Course

1. Attend all labs.
2. Read the corresponding material in the manual **before** the lab. See comments concerning quizzes above.
3. **Most importantly, try to understand the purpose of the experiment before you enter the lab!**
4. Go back over your lab notes as soon as possible after the lab and determine where any weaknesses in your understanding lie.
5. Utilize the instructor's and teaching assistant's office hours to ask any questions about areas with which you're having difficulty.
6. Use your other biology textbooks, or go to the library for related books, as resources for understanding basic concepts.
7. Explore the Internet.

Grading Scale

Grade Percentage Grade Percentage

A	≥93	C	76-73
A-	92-90	C-	73-70
B+	89-87	D+	69-67
B	86-83	D	66-63
B-	80-82	D-	62-60
C+	79-77	F	≤59

Policy on makeup tests, late work, and incompletes

If a student cannot attend an exam or hand in a homework project on time due to circumstances beyond their control then the instructor may assign appropriate make-up work. Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities. These students will be allowed to make up missed work without any reduction in the student's final course grade. Reasonable accommodation will also be made for students participating in a religious observance. Also, note that grades of Incomplete ("I") are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of "I" will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU's University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

Classroom etiquette policy

University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions."

Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) -- in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all OSD procedures.

Honor Code policy statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places

high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf. If your college has particular policies relating to cheating and plagiarism, state so here or provide a link to the full policy.

Supplemental Reading

Most students will find that the lab manual contains sufficient background information. However, if additional reading is needed, online searches of the topic will probably be the most productive. Students should utilize the online content (including videos, animations, podcasts, etc.) to improve their understanding of the technology.

Proposed Experiments

Week 1

Experiment 1 – *The Growth Curve*

Week 2

Experiment 2 – *Identification of Yeast Auxotrophic Mutants and Genetic Complementation*

Week 3 and 4

Experiment 3 – *Molecular Cloning of the RecA Gene of E. coli*

Week 5 and 6

Experiment 4 – *Molecular Analysis of the RecA Gene of E. coli*

Week 7 and 8

Experiment 5 – *Molecular Analysis of the MsrA Genetic Locus of Drosophila*

Week 9-12

Experiment 6 – *Functional Complementation Assay of E. coli Arginine Mutants*

Week 11-13

Experiment 7 – *Construction of an Expression Vector for Synthesis of Recombinant Drosophila MsrA and MsrB Protein in E. coli*

Week 12-15

Experiment 8 – *Overexpression, Isolation, and Characterization of a Recombinant Fusion Protein in E. coli*



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Department of Biological Sciences
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fax: 561.297-2749

TO: University Graduate Programs Committee (UGPC)
FROM: Rodney Murphey, Ph.D.
Professor and Chair
Department of Biological Sciences
DATE: February 19, 2014
RE: New Course Proposal Consent

To Whom It May Concern:

This note constitutes acknowledgement and consent of the Department of Biological Sciences for the creation of a new course within the department: **BSC 6468 – Methods in Biotechnology.**

Best Regards,

A handwritten signature in blue ink, appearing to read 'R. Murphey', with a long, sweeping flourish extending upwards and to the right.

Rodney Murphey, Ph.D.
Chairman, Department of Biological Sciences
Director, Life Science Initiative on the MacArthur Campus