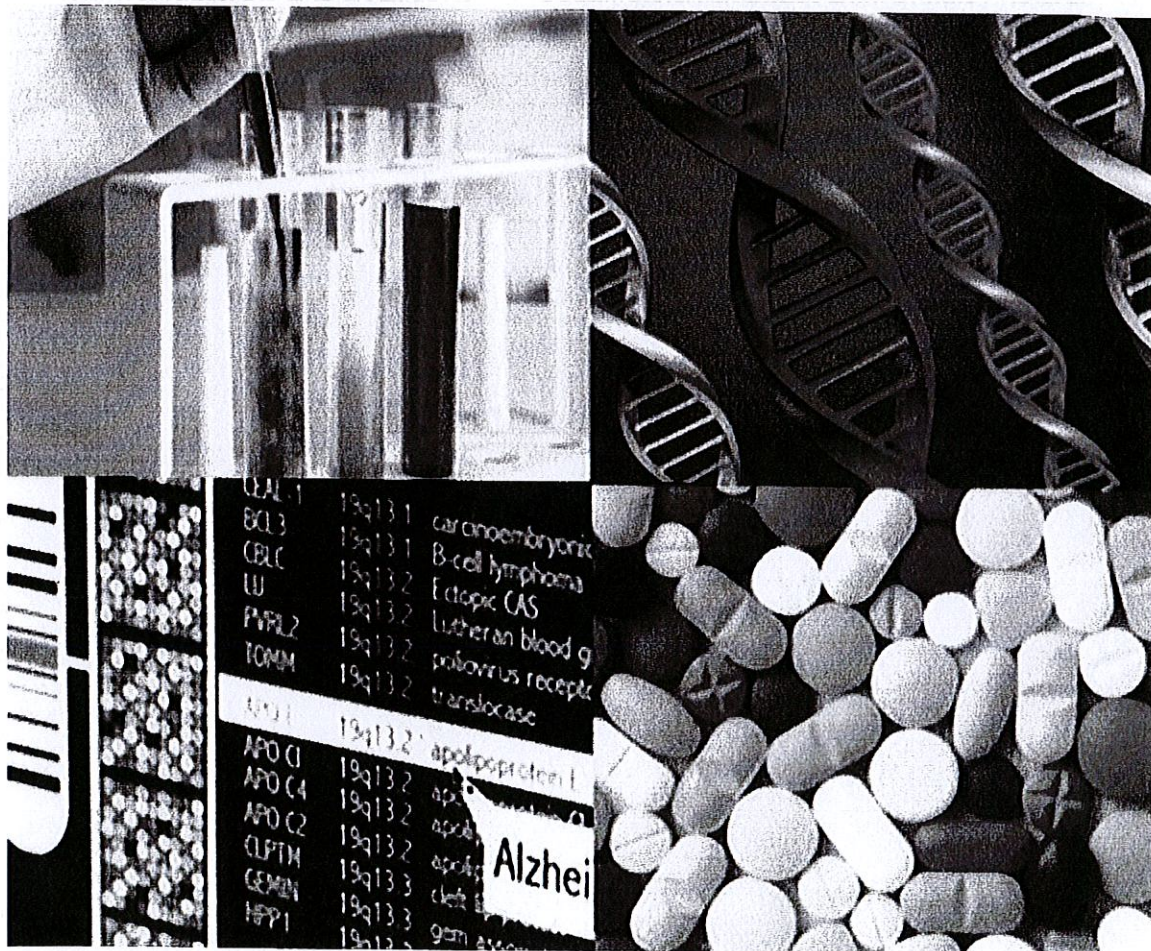


# Biotechnology Laboratory

1

BSC 4403L (2 credits)

Spring 2015



## Course Prerequisites

The prerequisites: C- or better in the following-*General Microbiology* (MCB 3020) and *General Microbiology Lab* (MCB 3020L), *Biochemistry I* (BCH 3033) and *Genetics* (PCB 3063)

## 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 1 Lab* will be completed close to Spring Break. *Biotechnology 2 Lab* will begin immediately after completion of *Biotechnology 1 Lab* will begin. 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 10:30AM-12:00PM or  
by appointment

Phone: 297-3323

Email: [binninge@fau.edu](mailto:binninge@fau.edu)

**E-mail is the most effective way of reaching me**

## Teaching Assistant

The teaching assistants for the course will be introduced on the first day of class.

## 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

The only official university holidays that affect this course is Spring Break.

## Course Evaluation

Notebook and Results-23%

Quizzes - 10%

Three out-of-class assignments — 9% each for a total of 27%

Two in-class written exams — 20% each for a total of 40%

## In-Class Written Exams

There will be two in-class written exams that account for 40% of your course grade. These are short answer and problem-based exams that 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 6 and Exam 2 is February 27.**

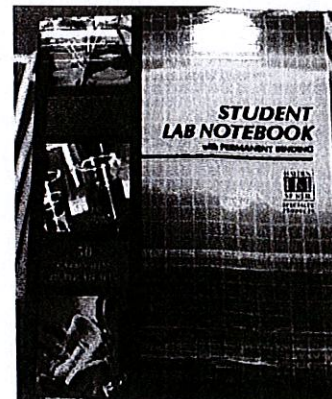
## Bioinformatics Assignments

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 21.**  
**Assignment 2 will be due on February 6**  
**Assignment 3 will be due on February 27**

## 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 SAM. *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 loss 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	93-100	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](http://www.fau.edu/ctl/4.001%20Code%20of%20Academic%20Integrity.pdf)

### **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

## **Week1**

Experiment 1 – *The Growth Curve*

## **Week2**

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*



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Department of Biological Sciences  
777 Glades Road  
Boca Raton, FL 33431  
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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: September 19, 2014  
RE: Course Prerequisite Change Consent

To Whom It May Concern:

This note constitutes acknowledgement and consent of the Department of Biological Sciences for the changes of the prerequisite of a current course within the department: BSC 4403L Biotechnology Lab I.

Best Regards,

A handwritten signature in blue ink, appearing to read 'R.K. Murphey', is written over the typed name.

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