Course Description:

Number and Title:

BIOL 4202L (CRN 24455), Biotechnology Laboratory

Credit Hours:

3.0 semester credit hours

Catalog Description:

An experiment-based course in which students use DNA technology to explore topics such as DNA fingerprinting, gene cloning, DNA amplification, genetically modified foods and organisms, gene therapies, inheritance and paternity, and human genetic diseases.

Course Requirement:

Pre-requisite: BIOL3250 and BIOL3250L; BIOL3201

Computer Requirement:

Each CSU student is required to have ready access throughout the semester to a notebook computer that meets faculty-approved hardware and software requirements for the student's academic program. Students will sign a statement attesting to such access. For further information on CSU's Official Notebook Computer Policy, please go to http://itpchoice.clayton.edu/policy.htm.

Computer Skill Prerequisites:

- Able to use the Windows™ operating system.
- Able to use the Microsoft Word™ word processing program.
• Able to send and receive e-mail using the Outlook™ or Outlook Express™ program.
• Able to use a Web browser (preferably Microsoft Explorer™).
• Able to print documents either on your home computer’s printer or Smart Print (networked printers on campus).

In-class Use of Student Notebook Computers:

• Student notebook computers will be required periodically in this class. Students will also use the computers to access supplemental lectures, laboratory assignments, protocols, review sheets, internet information, and to communicate with the instructor.

Course Objectives:

• To understand the fundamentals of molecular biotechnology
• To understand the processes involved in DNA replication, RNA synthesis, and protein translation
• To describe the basic application of recombinant DNA technology
• To understand commercial application of DNA technology and use in medicine and research
• To learn to use basic biological laboratory equipment
• To understand and use laboratory math and chemistry
• To learn to perform basic molecular biology techniques
• To learn to prepare laboratory notebooks and write laboratory reports based on experimental data, results and conclusions
• To apply critical thinking and problem-solving skills to laboratory situations
• To learn how to prepare research proposals
• To understand the regulation and patenting of biotechnology inventions

Student Learning Outcomes:

BIOL 4202L supports the following outcomes:

1. Effectively demonstrate knowledge of the basic principles of major fields of biology.
2. Demonstrate a mastery of a broad range of basic lab and technology skills applicable to biology.
3. Apply knowledge of physical sciences, mathematics, and statistics to biological concepts.
4. Communicate scientific information in a clear and concise manner both orally and in writing.
5. Demonstrate the ability to collect, evaluate and interpret scientific data, and employ critical thinking to solve problems in biological science and supporting fields.
6. Collaborate effectively on team-oriented projects.
7. Demonstrate the ability to identify and describe the impact of biological and physical sciences on the environment and society.

Instructor Information:

Dr. Fran Norflus
Office: Natural and Behavioral Sciences Building (NBS), Room 153
Phone: 678-466-4852
e-mail: FNorflus@clayton.edu
Internet: http://a-s.clayton.edu/fnorflus/
Office Hours:
Tuesday, 1:00 – 2:00 PM
Wednesday, 12:00 – 2:00 PM
Thursday, 12:00 – 1:00 PM
Friday, 10:00 – 12:00 PM

Class Meetings:

Laboratory Annex Building, Room 210

Tuesday and Thursdays, Room C21, 8:15 – 11:05 am
Textbook and Supply Information:

Textbook Information:

1. Biotechnology: A laboratory skills course by J. Kirk Brown

   This textbook is ONLY available through the bookstore or Biorad (www.Biorad.com).

   You will NOT be able to purchase it online.

   ISBN #: 978-0-9832396-0-4


Text Coverage: required readings will be listed in the course schedule

Note: Additional reading and laboratory materials will be provided by the instructor.

It is also recommended that you have handy your microbiology or genetics textbook. You may want to refer back to these books for additional background information on the laboratory techniques that we will be performing.


   Students must bring to class a laboratory coat, laboratory notebook, pencils and pens or digital camera.

   In the beginning of this class, we will learn how to use certain equipment and how to perform calculations. Once we start performing experiments, each student will be required to wear his/her laboratory coat. NO EXCEPTIONS!!!
Evaluation:

<table>
<thead>
<tr>
<th>item</th>
<th>points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills test</td>
<td>50 points</td>
</tr>
<tr>
<td>Exam 1</td>
<td>100 points</td>
</tr>
<tr>
<td>Exam 2</td>
<td>100 points</td>
</tr>
<tr>
<td>Project poster based on original research project</td>
<td>50 points</td>
</tr>
<tr>
<td>Lab notebook with pre lab and post Lab questions answered</td>
<td>50 points</td>
</tr>
<tr>
<td>Assignments/Quizzes</td>
<td>50 points</td>
</tr>
<tr>
<td>Resume</td>
<td>10 points</td>
</tr>
<tr>
<td>Final exam</td>
<td>100 points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>510 points</strong></td>
</tr>
</tbody>
</table>

Grading:

Your final grade will be determined as follows:

<table>
<thead>
<tr>
<th>grade</th>
<th>percentage range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100%</td>
</tr>
<tr>
<td>B</td>
<td>80 - 89%</td>
</tr>
<tr>
<td>C</td>
<td>70 - 79%</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69%</td>
</tr>
<tr>
<td>F</td>
<td>below 60%</td>
</tr>
</tbody>
</table>
Mid-Term Progress Report

The mid-term grade in this course will be based solely on your grade for the first exam. Based on this grade, students may choose to officially withdraw from the course by **Friday March 2, 2012** and receive a grade of "W".

The description of the skills test will be posted in a separate document.

The description of the project poster will be posted in a separate document.

The course schedule will be posted in a separate document.

**Final Examination Schedule:**

<table>
<thead>
<tr>
<th>CRN</th>
<th>Instructor</th>
<th>Date of final exam</th>
<th>Time of final exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>24455</td>
<td>Norflus</td>
<td>April 27, 2012</td>
<td>9:00 AM – 11:00 AM</td>
</tr>
</tbody>
</table>

**Course Policies:**

**Laboratory Safety:**

Students must follow safety rules and guidelines at all times. These rules will be discussed during the first meeting and students will be required to view a film on lab safety. If a student misses the first lab meeting, he/she will be required to read about the safety rules and watch the film before being allowed to perform any experiments.

Students are encouraged to report any violations of the safety rules to the instructor immediately. *Failure to follow specified safety rules will result in dismissal from the laboratory and receive a grade of zero for that lab.*

*Under no circumstances, may you come to class in sandals, flip flops, high heels, shorts or short skirts/dresses. If you do, you will need to leave the laboratory and receive a grade of 0 on all lab assignments for that day. You must wear covered shoes!!!! You must comply with this dress code even if we are not performing a laboratory exercise on a specific day.*

No eating or drinking will be allowed in the lab. You may not bring any food or beverages to the laboratory. If you do have anything, it must be in your book bag covered and out of site. You may not have any beverages on the bench tops, even if they are closed. If you are caught with any food or beverages, you will be asked to leave the lab and you will receive a grade of 0 for that lab.
Laboratory Attendance:

Students are expected to attend all class meeting. However, I will not take attendance. But, you will need to explain to your lab partners why you could not do the laboratories but they needed to do them. If you miss excessive laboratories, your lab partners may kick you out of the group. Then, you will be on your own and if there are no extra supplies, you will not be able to do the laboratories and will receive a grade of 0 on all of these laboratories.

You will also be graded on your laboratory notebook. If you miss a laboratory, regardless of the excuse, you will be given a grade of 0 on that laboratory exercise. You may NOT under any circumstances record results in your laboratory notebook for experiments that you did not complete. You may NOT copy your partner’s results.

Students are expected to come to class on time and bring laboratory materials, laboratory notebook, and colored pens/pencils (or digital cameras) to each class meeting. If you come in late, please don’t ask me to explain the lab that I already explained.

Lab notebook:

All students will be required to maintain a laboratory notebook throughout the semester. The format will be posted on the course web page at the beginning of the semester. However, please note that if you miss a laboratory then you will not be allowed to record any results from that day in your lab notebook and your grade on that assignment will be 0. You may NOT get the results from your lab partner and write it in your lab notebook.

I would like for you to purchase a composition notebook that will be displayed on the first day of class. You may NOT use a loose-leaf. Any of the following composition notebooks are acceptable:

http://www.staples.com/Staples-Composition-Notebook-Blue-Cover/product_639653

I will formally grade your notebook two times during the semester. However, I will also randomly look at notebooks throughout the semester. If you have not recorded the proper information in the notebook, you will have points deducted from your notebook grade.

All notebooks are due at the end of class on the day that I tell you that I will collect them. If you do not hand it in, you will receive a grade of 0. If you have a valid excuse, you may hand it in late as described below. Oversleeping, car problems or getting stuck in traffic are not valid excuses and you will be given a grade of 0.

A description of the notebook requirements will be posted separately.
Quizzes and Assignments:

All assignments must be typed unless the instructor directs otherwise. All assignments that are more than one page must be stapled. If you use paper clips or fold the pages over, the assignment will be returned to you. All reports/assignments are due at the beginning of class and must neat and stapled. For each day that the assignment is late, 10 points will be deducted. Late means after I start lecturing for the day or the lab begins. No assignments will be accepted after 3 days past the due date.

I will drop your lowest quiz/assignment grade. I will not collect any excuses that you have but if you miss 2 assignments, regardless of the excuse, you will be given a grade of 0.

Laboratory Class Meeting and Exams:

Absences from EXAMS must be accompanied by a signed physician's or judge's excuse (there are no exceptions). The instructor must be notified immediately before or after missing an exam. THERE WILL BE NO MAKEUP LABS OR EXAMS. Without an excuse provided within one week, a grade of zero points will be assigned for the missed work. If the student has a valid excuse, the final exam will be doubled to make up for the missed exam. If a student misses the final exam and has a valid excuse, a makeup will be administered.

If you are absent the day that I collect the lab notebooks, you must bring your excuse and notebook to class on the day that you return or you will receive a grade of 0.

Students will only be allowed to miss one exam during the semester. After that, a grade of 0 will be given for the missed exam.

If you miss the skills test, your assignment grade will count twice. However, you must provide a valid excuse upon returning to class.

E-mail accounts:

All students must establish and maintain their CSU e-mail accounts. For many laboratory exercises, students will be expected to download laboratory pre-lab assignments and protocols from the course web page.

Group Work:

Students will work in groups of 2 to complete laboratory experiments. Students are encouraged to work in groups to discuss laboratory experiments but all written work
must be unique and completed separately be each student. All tests, quizzes and the final poster are independent projects to be completed by each student individually.

Course Policies:

Students must read course policies as stated below on first day of class.

Students must abide by policies in the Clayton State University Student Handbook, and the Basic Undergraduate Student Responsibilities.

No disruptive behavior of any kind will be tolerated.

Disruption of the Learning Environment
Behavior which disrupts the teaching–learning process during class activities will not tolerated. While a variety of behaviors can be disruptive in a classroom setting, more serious examples include belligerent, abusive, profane, and/or threatening behavior. A student who fails to respond to reasonable faculty direction regarding classroom behavior and/or behavior while participating in classroom activities may be dismissed from class. A student who is dismissed is entitled to due process and will be afforded such rights as soon as possible following dismissal. If found in violation, a student may be administratively withdrawn and may receive a grade of WF.

A more detailed description of examples of disruptive behavior and appeal procedures is provided at:

http://a-s.clayton.edu/DisruptiveClassroomBehavior.htm

University Attendance Policy
Students are expected to attend and participate in every class meeting. Instructors establish specific policies relating to absences in their courses and communicate these policies to the students through the course syllabi. Individual instructors, based upon the nature of the course, determine what effect excused and unexcused absences have in determining grades and upon students’ ability to remain enrolled in their courses. The university reserves the right to determine that excessive absences, whether justified or not, are sufficient cause for institutional withdrawals or failing grades.

- No electronic devices are allowed while in the biotechnology laboratory. Use of electronic devices in the laboratory is considered a violation of laboratory safety procedures and the university’s disruptive behavior policy. Dr. Norflus talked to the class on Feb. 23, 2012 and stated that the use of cell phones during class is a violation of the class and university’s disruptive behavior policy. If a student is caught using their phone after this date, they will be dismissed from the class with a grade of WF. If you need your cell phone to tell the time, record lectures or any similar activities, you will need to find a different way to do it. The only exception will be to take pictures of gels with your cell phone or if there is an emergency. These
calls must be taken in the hallway. Routine texting is NOT considered an emergency.

- Most of the lab protocols are in the textbook. If you need to print additional materials, you must print them **BEFORE** coming to class.

- Visitors (friends, children, etc) are strictly prohibited from attending class without the permission of the instructor.

- No smoking, eating or drinking is permitted at any time in the laboratory. If you are caught, you will be asked to leave.

- **NO CHEATING.** Cheating is defined as copying anything that is not your own work. This applies to laboratory report, laboratory notebooks, laboratory assignments, laboratory quizzes and exams. You are not to copy word for word what I post as background for the labs in your lab notebook or lab reports. You must write it in your own words. You are also not to copy word for word what you find on the Internet. **Cheating in any form will result in a zero on the assignment and academic misconduct forms will be filed with the Office of Judicial Affairs for any violation.**

- Judicial procedures are described at [http://adminservices.clayton.edu/judicial/](http://adminservices.clayton.edu/judicial/)

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*Last update: 2/23/12*