# UTRGV COURSE SYLLABUS

# SPRING 2017

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| BMED 3224-05: Independent Research IV<br>Spring 2017<br>Meeting times and location: Friday 1-4pm – 4, LHSB 1.208 | Instructor Name: Ms. Michelle J. Zamarron<br>Instructor Office and Telephone BRHP 1.113<br>Instructor Office Hours: Monday 11-3, Tuesday 10-2pm, Friday 11-1pm or by appointment<br>Instructor Email:michelle.zamarron01@utrgv.edu |

*****This syllabus represents the current course plans and objectives. As we go through the semester, those plans may need to be change to enhance the class learning opportunity. Any changes made will be updated in the syllabus and communicated to the students.***

**Textbook**

- Principles of Biology, Sapling Learning (you should have access to this already)
- Lab notebook with duplicating pages from the UTRGV bookstore (Chemistry Lab notebook 50 Carbonless Duplicating Sets, ISBN: 9780978534400, $17.75).

**Course Description**

This course is designed to introduce the students to laboratory techniques and principles that are often used for biomedical science research. The students will learn how to perform experiments and analyze and discuss the data obtained. The students will learn how to identify and apply basic techniques to answer specific questions in a research environment.

**Student Learning Outcomes**

At the end of this course, the students are expected to be able to:

- Know good and safe laboratory practices
- Maintain a detailed and complete laboratory notebook
- Accurately collect, record and analyze data
- Work as a team to complete experiments correctly in a timely manner
- Perform PCR and gel electrophoresis
- Culture cells (thaw, maintain and count cells) with aseptic techniques
- Determine cell cycle with a cell analysis system
- Perform immunoblotting to quantify specific proteins

**Departmental Learning Outcomes**

Departmental learning outcomes that are met by this course are:

- Students will be able to demonstrate a substantial factual knowledge base and a grasp of the major concepts of biomedical research and able to relate them to the medical field
- Students will perform satisfactorily in standardized graduate examinations
- Students will be able to research a topic using standard electronic and non-electronic methods
- Students will be able to communicate complex scientific ideas, concepts, and theories by oral and written means
- Students will appreciate the role of research in the biological, biomedical, and clinical sciences

**Course Pre-Requisites, Co-Requisites, and/or Other Restrictions**
**Pre-requisites: BMED 3223 Independent Research III**

## Course Setup

**Before class, you are required to study the lab protocol, read the assigned materials and watch the videos pertaining to the lab techniques we will be covering that week and complete the Pre-Lab Questionnaire on Blackboard**. Since we have only a limited amount of time in the laboratory each week, you need to come to lab very well prepared to be able to complete the assigned experiment(s) in the time allocated. Your unpreparedness will affect not only you and your team, but will also slow down the whole class.

**For certain weeks, you may be required to come in on Fridays and/or Mondays for around half an hour to change the media for your cells**. If you are unable or unwilling to come in for these sessions, please drop the class. **Due to the availability of only one biosafety cabinet for this course, for several weeks the class will be divided to sessions** (2 hours each) consisting of around 8-10 students to facilitate the learning of the techniques involving cell culturing.

## Assignments

***iRAT (Individual Readiness Assurance Test) (15%) – 3 assignments, done in class***
Each week when we will be preparing for a technique/experiment, you will be required to go over the reading and video assignments before class. At the beginning of class, you will be taking a multiple choice iRAT to assess if you have prepared for class.

***tRAT (Team Readiness Assurance Test) (10%) – 3 assignments, done in class***
This will be the same questions as the iRAT, however this will be done as a group.

***Pre-Lab Questionnaire (15%) – 8 assignments, done at home***
Each week when we will be conducting a technique/experiment in the lab, you will be required to answer a Pre-Lab Questionnaire that will be posted on Blackboard in the Course Material section. This assignment has to be done before class and you will not be able to access it once class starts. This questionnaire will evaluate if you are prepared for the experiments/techniques that are planned for the week based on the reading and video assignments and also evaluate if you paid attention during the preparation class. By answering the questions, you will be able to perform the lab more efficiently and correctly and finish in a timely manner.

***Lab Conduct (10%)***

You will be evaluated on a few basic principles that all good researchers should possess:

1. **Enthusiasm**: How much desire the student has to perform the experiments
2. **Punctuality and Time Management**: Arriving on time for the timeslots that the student register for, Completing experiments before the end of the timeslot
3. **Preparedness**: How well the student comes prepared with the materials for the experiments and know what should be done to complete the experiments
4. **Initiative**: How often a student take the initiative to proceed independently on the experiments, Plan to repeat experiment when needed
5. **Synthesis**: How well the student can develop new ideas and implement methods to any problems with an experiment
6. **Cleanliness**: How well the student clean up and organize the area they work in

***Lab Reports (25%) – 3 assignments, done at home (written, not typed)***
Each of you is required to keep a lab notebook with a complete lab report for each technique/experiment performed in the laboratory. Late lab reports will NOT be accepted and you will get a zero for that assignment. The grading will take into account thorough documentation of the techniques/experiments, presentation, analysis and discussion of the results as well as answers to the assigned questions for each experiment. A rubric will be provided.

***Final Exam (25%) – 1 assignment, done in class***

You will be taking a final exam at the end of the semester. The exam will evaluate your understanding of the principles and techniques being taught in the class and how to apply them in a biomedical science research environment.

**Tentative Class Schedule**

| Week | Date | Lab Experiments | Assignments Due[#] |
|---|---|---|---|
| 1 | 1/17 or 1/18 | Introduction, Syllabus, Lab Safety, Lab Notebooks | |
| 2 | 1/24 or 1/25 | Preparation for Lab 1: PCR and Gel Electrophoresis | Lab 1 iRAT and tRAT in class |
| 3 | 1/31 or 2/1 | Lab 1a: DNA extraction and PCR | [#]Lab 1a Pre-Lab Questionnaire |
| 4 | 2/7 or 2/8 | Lab 1b: Gel electrophoresis of PCR product | [#]Lab 1b Pre-Lab Questionnaire |
| 5 | 2/14 or 2/15 | Preparation for Lab 2: Cell culture and cell cycle analysis | Lab 1 Report<br>Lab 2 iRAT and tRAT in class |
| 6* | 2/21 or 2/22 | Lab 2a: Cell culture - Aseptic techniques, thawing and plating cells* | [#]Lab 2a Pre-Lab Questionnaire |
| 7* | 2/28 or 3/1 | Lab 2b: Cell culture - Counting cells with a Hemocytometer and Cellometer, replating cells* | [#]Lab 2b Pre-Lab Questionnaire |
| 8* | 3/7 or 3/8 | Lab 2c: Cell cycle analysis with Cellometer* | |
| **9** | **3/14 or 3/15** | **SPRING BREAK – No class** | |
| 10 | 3/21 or 3/22 | Preparation for Lab 3: Western blot | Lab 2 Report<br>Lab 3 iRAT and tRAT in class |
| 11 | 3/28 or 3/29 | Lab 3a: Western blot - Sample preparation (lysing cells, protein concentration analysis, denaturing) | [#]Lab 3a Pre-Lab Questionnaire |
| 12 | 4/4 or 4/5 | Lab 3b: Western blot – Gel preparation, run gel, transfer gel | [#]Lab 3b Pre-Lab Questionnaire |
| 13 | 4/11 or 4/12 | Lab 3c: Western blot – Imaging of membrane | [#]Lab 3c Pre-Lab Questionnaire |
| 14 | 4/18 or 4/19 | Journal Club – getting familiarized with a research article | Lab 3 Report |
| 15 | 4/25 or 4/26 | Final Exam Review | |
| 16 | 5/2 or 5/3 | | |

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| 16 | 5/5-5/11 | **FINAL EXAM** | Date and time TBD |

*Class will be divided to sessions (2 hours each) consisting of 8-10 students per session

#Pre-Lab Questionnaire must be done in Blackboard before class each week

**UTRGV Policy Statements**

STUDENTS WITH DISABILITIES:
If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus**: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD:
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Online evaluations will be available Nov. 18 – Dec. 9, 2015. Students who complete their evaluations will have priority access to their grades.

ATTENDANCE:
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

SCHOLASTIC INTEGRITY:
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:
In accordance with UT System regulations, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and so must report any instance, occurring during a student's time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

COURSE DROPS:
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the "3-peat rule" and the "6-drop" rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.