Fayetteville State University
College of Basic and Applied Sciences
Department of Biological Sciences
BTCH 440 (Tissue Culture & Hybridoma Technology)
Fall 2011

I. Locator Information:

Instructor: Muhammad Lodhi
Course # and Name: BTCH 440
Semester Credit Hours: 3-6-0
Day and Time Class Meets: Labs TR 8:00-10:50 AM
Class Location: LS218
Office Location: LSA 320 (Lab – LSA 240)

Office hours: MW (8:00 – 10:00 AM), TR (1:00 – 3:00 PM) & F (2:30 – 3:30 PM) OR by appointment
Office Phone: 910-672-1658
Email address: mlodhi@uncfsu.edu
Webpage: http://faculty.uncfsu.edu/mlodhi

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.
Rules and regulations governing the use of FSU email may be found at
http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

II. Course Description: A laboratory course which teaches techniques for the establishment, assay, and maintenance of a variety of types of cells, tissue and hybridoma cultures. Also this course familiarizes students with plant tissue culture.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook: Culture of Animal Cells. 5th edition, 2005. RI Freshney. Wiley-Liss Publisher
Additional text: Basic Cell Culture. 2nd edition, 2002. JM Davis. Oxford Press.

V. Student Learning Outcomes: Upon completion of this course, students will be able to;

- Perform basic mammalian cell culture and differentiation using aseptic techniques as determined by lab report and class demonstration
- Discuss components of mammalian cell culture such as environment, media and lab equipment as evidenced with lab report, class demonstration, exam and assignments
- Demonstrate cell harvesting methods and cryopreservation techniques as assessed with lab report, class demonstration and exam
- Understand hybridoma technologies and their application as demonstrated by assignment and exam
- Design and carry out experiments involving mammalian cells as evidenced with lab report, class demonstration and exam
- Extract nucleic acids and proteins from cells grown *in vitro* as established with lab report, assignment and exam
- Comprehend plant tissue culture techniques as assessed with lab report, class demonstration and exam
- Maintain a well organized laboratory notebook

VI. Course Requirements and Evaluation Criteria: *Prerequisites: BIOL 200, BTCH 230, or consent of instructor*

a. Grading Scale – Following standard FSU grading scale will be used

Percent of Points	Grade
91 – 100	A
82 – 90	B
73 – 81	C
65 – 72	D
<65	F
Excessive Absences	EA

Incomplete	I
No Show	X

b. Final grade will be based on the following evaluation components

	Item	Number of Items	Points/Item	Total points	%age
1	Lab Reports	4	40	160	47
2	Lab Notebook	1	40	40	12
3	Research Paper	1	40	40	12
4	Exams	2	30	60	18
5	Poster Project	1	40	40	12
	Total			**340**	100

1. **Lab Reports:** Comprehensive reports shall be submitted by the students in all the projects/cell types they will work on. Attempt will be made to work with at least two mammalian cell lines for cell culture, proliferation and differentiation**.** In addition, good understanding will be developed with the hybridoma technologies for producing vaccines. Lab reports will be asked from you at a week's notice. Rubric will be provided to write reports and for assessment purposes.

2. **Lab Notebook:** Each student will be required to keep an up to date laboratory note book and record all the techniques and projects conducted during the course of the semester. The notebook can be a composition type or a3-ring bound. All the class work and recording needs to done to show your work. All the handouts should also be pasted in the notebook and no loose papers should be added in it. Lab notebook will be collected from you at the end of the semester for evaluation. Be neat and organized on your notebook. This will provide you some ideas of how notebooks are maintained in industry.

3. **Research Paper:** Topics for the research papers will be limited to the application of molecular biology or biotechnology to immunology. Topics will be distributed in the class. Length of the paper will be a minimum of 4 pages, 1.5 line spacing and not more than 12 font size. It will be due on or before November 15. More details regarding the content of the paper will be covered in the class. However it should contain a good introduction, literature review, experimental strategies, results and bibliography. Papers submitted one day late will be considered only for 80% of the grade of that assignment. Any paper submitted after a week of the due date will not be accepted. Rubrics will also be provided as a guide for writing and assessment. Rubric will be provided.

4. **Exams:** Two exams will be given on the topics discussed and covered in the class during the semester. Each exam will cover the material covered a week before the exam. Each exam will be of 30 points.

5. **Poster Project:** Each group will work on extracting primary cells from mice. At the completion of this project two posters will be developed describing the procedure followed.

c. Attendance Requirements – Students will work in teams of two and are expected to attend all the classes and activities organized by the instructor. Failing to do so may result in the lowering of the student grade by one letter grade. If two members of the same team are absent on the same day, they will not be allowed to complete the ongoing project or submit the lab report for the project.

Medical and family emergencies do not include a routine doctor's or dentist's exam.

Coming late to the class is highly unprofessional. If you are late by 5 minutes, you are absent from the class for that day. Please make sure you understand this policy clearly. Three tardy days will be counted as one absence.

Due to the nature of the cell culture, students may be required to come back to the lab other than the two days of scheduled class time to follow-up on an on-going procedure or start a new procedure.

Please note: If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus.

Student Behavior Expectations:
The *Code of the University of North Carolina* (of which FSU is a constituent institution) and the *FSU Code of Student Conduct* affirm that all students have the right to receive instruction without interference from other students who disrupt classes.

FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will "prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations." Each classroom is a mini-community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class.

The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Cell phone and text messaging devices will not be allowed to be used in the class

Consequences for Failing to Meet Behavioral Expectations*: The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.*

1. Direct student to cease disruptive behavior.
2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At his meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student's final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member's department chair.

VII. Academic Support Resources – Students who are earning less than a "C" average will be encouraged to attend tutorial sessions provided free by various units and centers below.
http://www.uncfsu.edu/univcoll/services.asp
http://www.uncfsu.edu/learningcenter/
http://www.uncfsu.edu/sss/
http://www.uncfsu.edu/cpser/tutorialservices.htm

Online tutoring is also available through Smartthinking: http://www.uncfsu.edu/fsuretention/smarthinkingflyer.pdf

VIII. Course Outline and Assignment Schedule
Provided separately as Course Schedule

IX. Teaching Strategies
Emphasis in this course is on the hands-on work in teams of two students. Each week student will work on some aspect of cell culture in a team of twos. Along with laboratory work students will prepare a lab notebook to

understand how observations and data is gathered and reported. Also, students will be given assignments and research papers to independently learn and enhance their understanding of the subject.

X. References

1. American Type Cell Culture (www.atcc.org)
2. Corning Life Sciences (www.corning.com/lifesciences)
3. Plant Biotechnology, 2nd ed. Slater, Scott and Fowler. 2008. Oxford Press
4. American Society of Cell Biology (http://www.ascb.org/)
5. International Society of Stem Cell Research (http://www.isscr.org/)
6. Students should also visit university library to read Science, Nature, Nature Cell Biology, Journal of Cell Biology, Molecular Cell Biology and other such publications.