UTD	Course	Cell and Molecular Biology Laboratory BIOL 4380-103
	Professor	Mehmet Candas
	Term	Fall 2008
	Meetings	Lecture (SOM1.110) Wed 2:30 PM – 3:45 PM
		Laboratory (MP2.202) Sat 10:00 AM - 2:00 PM (Session 103)

Contact Information

Office Phone	972-883-6338
Office Location	FO 3.208
Lab Phone	972-883-2277
Lab Location	MP2.202
Email Address	candas@utdallas.edu
Office Hours	Appointment required. Tuesday, Wednesday, Thursdays 9:00 a.m. - 2:00 p.m.
Other Information	Best way to reach Dr. Candas is via email communication. If you need to have a meeting, please schedule via e-mail.

General Course Information

Pre-requisites	Prerequisites for the course are successful completion of BIOL 3301 (Classical and Molecular Genetics), BIOL 3302 (Eukaryotic Molecular Cell Biology) and BIOL 3380 (Biochemistry Laboratory) or their equivalents.
Course Description	Cell and Molecular Biology Laboratory is an applied course that emphasizes a range of laboratory methods utilized to solve experimental problems related to cell and molecular biology as well as biochemistry. The laboratory exercises are based on preparation of DNA and protein samples, and instrumentation related to qualitative and quantitative analyses. Theoretical background and experimental rationale are provided in laboratory lectures covering current techniques utilized in modern research laboratories. Practical skills taught in the course include techniques for monitoring bacterial growth, phenotype testing for yeast and bacterial strains, DNA manipulation, cloning, plasmid DNA isolation, transformation, transfection, restriction enzyme digestion, gel analysis and plasmid mapping, DNA fingerprinting and chemical mutagen testing.

	Techniques covered in the lab also include polymerase chain reaction (PCR), gel electrophoresis, gel imaging, animal cell cultures, microscopy, differential centrifugation, sub-cellular fractionation, UV-VIS spectroscopy and plate assays.
Learning Outcomes	**The primary objective of the course is to train students in essential laboratory techniques and provide scientific concepts utilized in molecular and cell biology applications. The objectives include:** • **Become familiar and gain hands-on experience in basic techniques involving:** ▪ **bacterial genetics** ▪ **DNA isolation** ▪ **restriction digestion, gel analysis** ▪ **plasmid cloning** ▪ **bacterial transformation** ▪ **PCR, DNA fingerprinting** ▪ **animal cell culture, microscopy** ▪ **transfection, gene/protein expression** ▪ **centrifugation, cell fractionation** ▪ **basic functional assays with multi-well plates including determination of ion-trapping, cell death and enzyme activity** • **Master fundamental mathematical applications required for molecular biology laboratory practices.** • **Construct and interpret figures, charts, and graphs.** • **Express scientific ideas and present experimental data by writing accurate reports in a clear, concise and logical manner.**
Required Text	**The lecture and lab manuals will be placed on reserve at the University Copy Center (University Bookstore) (972-883-2269).**
Course Access and Navigation	**Information about the course is communicated through WebCT. Students can use their UTD NetID account to login to the course at http://webct.utdallas.edu.**

Academic Calendar & Assignments

LECTURE	LAB	EXP #	ASSIGNMENT
Sep 3	Sep 5, 6	1A	Basic bacterial techniques I Plate pouring, sterile technique, streaking, phenotype testing, replica printing
Sep 10	Sep 12, 13	1B	Basic bacterial techniques II Growth curves & determination of bacterial titer
Sep 18	Sep 19, 20	3	Gel electrophoresis of pre-digested DNA
Sep 24	Sep 26, 27	4	Restriction digest and ligation
Oct 1	Oct 3, 4	5**	Bacterial transformation
Oct 8	Oct 10, 11	6	Isolation and analysis of plasmid DNA
Oct 15	Oct 17, 18		LECTURE MIDTERM EXAM & LAB PRACTICAL 1
Oct 22	Oct 24, 25	7**	PCR and DNA fingerprinting
Oct 29	Oct 31, Nov 1	8	Cell culture and DNA transfection
Nov 5	Nov 7, 8	9	Ion trapping and drug delivery across membranes
Nov 12	Nov 14, 15	10	Ames test
Nov 19	Nov 21, 22	11	Centrifugation and cell fractionation
	Nov 28, 29		THANKS GIVING
Dec 3	Dec 5, 6		LAB PRACTICAL 2
	Dec 12, 13		FINAL WEEK

** In order to complete lab report questions, students are required to observe results and obtain data outside of the normal scheduled lab/lecture periods. Schedule is subject to change

Assignments and Grades

Experiment	Assignment	Max Grade
1a,1b	Basic Bacterial Techniques I and II	50
2	Gel electrophoresis of pre-digested DNA	50
3	Cloning I – Restriction digest and ligation	50
4	Cloning II - Bacterial transformation	50
5	Cloning III – Isolation of plasmid DNA, restriction digest	25
Exam	Midterm Exam on Experiments #1-#5	150
Practical	Midterm Lab Practical	100
3-6, 8	Cloning IV – Combined Report	100
7	DNA fingerprinting using PCR	50
8	Basic cell culture techniques	50
9	Biomembranes and Ion Trapping	50
10	Ames test	50
11	Cell fractionation	25
Practical	Final Lab Practical	100
Exam	Final Exam on Experiments #1-#11	150
----	Extra Credit	
----	Extra Credit	
----	Subtract lowest 50 point lab report grade or both 25 point lab reports	Minus ?
----	Final Grade	1000

Grading criteria

	Points Earned	Letter Grade	Points Earned	Letter Grade
Lab Reports, Exams and Attendance	98-100%	A+	76-78%	C+
	92-96%	A	72-75%	C
	89-91%	A-	69-71%	C-
	86-89%	B+	66-68%	D+
	82-85%	B	62-65%	D
	79-81%	B-	59-61%	D-

Course Policies

Lab Reports, Exams and Attendance	**Grading is based on laboratory reports for each experiment, a combined report for collective analysis of a series of experiments, practical tests based on demonstration of critical laboratory skills and techniques, including research design, data analysis and interpretation, by students.** **There are eight lab reports worth 50 points each, two reports worth 25 points each, and one combined lab report worth 100 points.** **You will be able to drop the lowest 50 point lab report or both 25 point lab reports. In general, lab reports are due one week after having conducted the lab.** **The reports are due at the beginning of the lab period. Late reports will be deducted 5pts per day missed.** **You have one week (from the time a graded lab report is returned to you) to contest the severity of the grading. Except for clerical errors in the grade book, we will not consider changing the lab report grade after that week has past. You will be given your report back in a week after submitting it except for 100 point report.** **The lab report format will vary from week to week depending upon the type of experiment that was performed. In general, the format will be presentation of data, calculations, and short answers to discussion questions. All reports should be typed (figures and calculations are exceptions), and should include all questions and points for each question.** **Laboratory reports will not be accepted from students who do not participate in the laboratory session.** **Mid-term Exam – The mid-term exam will cover the material presented through and including lab just prior to the midterm exam.** **Mid-term Lab Practical – In order to objectively test your laboratory technique, a lab practical during regularly scheduled lab time is conducted. The intent is to test student's ability to perform at the bench. The mid-term lab practical will be composed of several stations where student is asked to perform a routine laboratory procedure that has been covered in the course. One of the stations**

	will be a written calculations test. No partial credit is awarded for incorrect calculations. **Final Exam - The final exam will be a comprehensive exam that will focus primarily on experiments conducted after the midterm exam.** **Final Lab Practical – Final lab practical will test student's ability to design and perform experiments as well as theoretical understanding of the concepts covered in the laboratory course during the semester.** **In the event that student scores poorly at the lab practical, a re-take exam will be available. The highest grade that can be earned on a re-take practical will be 77 points.** **There is no make-up laboratory for any missed experiment.** **When the course has multiple sections, attendance at a different lab section time may be allowed with the approval from the Instructor(s).** **In the event that student can not attend any lab section because of either being admitted at a hospital or attending a medical/graduate school interview, then a "NG" (no grade) will be given for that experiment. The first occurrence will be applied to student's "drop the lowest 50 point lab report grade" option. A "NG" does not count for or against course grade.** **Grades will be based on correct answers, scientific quality of data, lab safety and handling of samples. A total of 1000 points can be earned for assignments in the course. Several extra points (not more than 30 points) may be given throughout the semester.**
Special Assignments	**None**
Class/ Laboratory Attendance	**Class and lab attendance is mandatory.** **Attendance at a different lab section time is not allowed without prior approval from the Instructor. If the switch is desired between Friday and Saturday lab, both instructors should be notified by e-mail at least one week before the lab. Approval should be obtained from both instructors.**

	There is no make-up for missed laboratory classes. However, your absence can be excused in the event that you are unable to attend any one of the lab sections due to a sickness or a scheduled interview for medical or graduate school admission. In these instances, you will receive a "NG" (no grade) for that experiment (the first occurrence will "use up" your "drop the lowest 50 point lab report grade"). A "NG" does not count for or against your course grade.
Student Conduct and Discipline	**The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.** **The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. The rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).** **A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.**
Academic Integrity	**The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.** **Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is**

	not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings. **Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.**
Email Use	**The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.**
Withdrawal from Class	**The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.**
Student Grievance Procedures	**Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.** **In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the**

	matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties. **Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.**
Incomplete Grades	**As per university policy, incomplete grades will be granted only for work unavoidably missed at the end of semester and only if 70% of the course work has been completed.** **An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.**
Disability Services	**The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.** **The contact information for the Office of Disability Services is:** **The University of Texas at Dallas, SU 22** **PO Box 830688** **Richardson, Texas 75083-0688** **(972) 883-2098 (voice or TTY)** **Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination**

	on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance. **It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.**
Religious Holy Days	**The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.** **The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.** **If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.**

Off-Campus Instruction and Course Activities	**Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm . Additional information is available from the office of the school dean.**

These descriptions and timelines are subject to change at the discretion of the Professor.