

## *Course Syllabus*

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### **Course Information**

BIO/CHM3361-001 and BIO3161-001 : Biochemistry I with Workshop

*Note: You must be enrolled in section 001 of workshop specifically (the Friday 12:30-1:20pm section).*

Lecture:	FN2.102	MWF	11:30-12:20pm
Workshop:	CN1.120	F	12:30-1:20pm

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### **Professor Contact Information**

Dr. Donovan C. Haines

Phone: 972-883-4542

Email: [haines@utdallas.edu](mailto:haines@utdallas.edu)

Office: BE2.518

Office Hours: MW 2:00pm-3:00pm (Listen for possible changes announced in class.)

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### **Course Pre-requisites, Co-requisites, and/or Other Restrictions**

Pre-requisites:

CHEM2323 Organic Chemistry I

CHEM2325 Organic Chemistry II

Also now listed in the catalog but not enforced (some majors take Biochemistry but do not take these classes, this is being looked into):

BIOL2311 Intro to Modern Biology I

BIOL2281 Introductory Biology Lab

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### **Course Description**

BIOL 3361 Biochemistry I (3 semester hours) Structures and chemical properties of amino acids; protein purification and characterization; protein structure and thermodynamics of polypeptide chain folding; catalytic mechanisms, kinetics and regulation of enzymes; energetics of biochemical reactions; generation and storage of metabolic energy associated with carbohydrates; oxidative phosphorylation and electron transport mechanisms; photosynthesis.

BIOL 3161 Biochemistry Workshop I (1 semester hour) Problem solving methodology in biochemistry; discussion of recent advances in areas related to the subject matter in BIOL/CHEM 3361.

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## **Student Learning Objectives/Outcomes**

1. Explain the basic thermodynamics governing biochemical reactions and use this information to solve problems involving biochemical thermodynamics.
  2. Recognize the molecular structures and describe the chemical properties of proteins, their amino acid residues, and carbohydrates; and solve related pH problems.
  3. Explain enzyme catalysis and regulation, and apply enzyme kinetics in problem solving.
  4. Describe the central pathways for the catabolism of glucose and complex carbohydrates, and gluconeogenesis
  5. Understand the organization of electron transport chains, and the different mechanisms for ATP synthesis
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## **Required Textbooks and Materials**

R.H. Garrett and C.M. Grisham: Biochemistry, 3rd edition, Brooks/Cole, Boston, MA (ISBN 0-534-49033-6).

*Note: There is a new “updated” 3<sup>rd</sup> edition of the text that has some added problems at the end of each chapter. Either 3<sup>rd</sup> edition will suffice.*

D.K. Jemiolo and S.M.Theg: Student Solutions Manual, Study Guide and Problems Book to accompany Garrett & Grisham Biochemistry, 3rd edition, Brooks/Cole, Boston, MA (ISBN 0-534-49035-2). This textbook will be used in conjunction with the Workshops, BIOL 3161.

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## Assignments & Academic Calendar

	Date	Topic	Chapter		Workshop
Fri	8/17/2007	Intro	1		No Workshop
Mon	8/20/2007	Water/Buffers	2		
Wed	8/22/2007	Thermo	3		
Fri	8/24/2007	Thermo/Amino Acids	3 & 4		Buffers/Thermo calcs
Mon	8/27/2007	Amino Acids	4	PS#1 Due	
Wed	8/29/2007	Protein - primary	5		
Fri	8/31/2007	Protein - primary	5		Amino Acids
Mon	9/3/2007	NO CLASS - HOLIDAY		PS#2 Due	
Wed	9/5/2007	Protein - primary	5		
<b>Fri</b>	<b>9/7/2007</b>	<b>EXAM 1</b>			<b>(Exam 1)</b>
Mon	9/10/2007	Protein - 2,3,4	6		
Wed	9/12/2007	Protein - 2,3,4	6		
Fri	9/14/2007	Kinetics	13		Protein Structure
Mon	9/17/2007	Kinetics	13	PS#3 Due	
Wed	9/19/2007	Kinetics	13		
Fri	9/21/2007	Mech	14		Enzyme Kinetics
Mon	9/24/2007	Mech	14		
Wed	9/26/2007	Mech	14		
					Enzyme Mechanism and Regulation
Fri	9/28/2007	Regulation	15		
Mon	10/1/2007	Regulation	15	PS#4 Due	
Wed	10/3/2007	Regulation	15		
<b>Fri</b>	<b>10/5/2007</b>	<b>EXAM 2</b>			<b>(Exam 2)</b>
Mon	10/8/2007	Intro to Metabolism	17		
Wed	10/10/2007	Vitamins & Coenzymes	17		
Fri	10/12/2007	Vitamins & Coenzymes	17		To Be Announced
Mon	10/15/2007	Carbohydrates	7		
Wed	10/17/2007	Carbohydrates	7		
Fri	10/19/2007	Glycolysis	18		Carb Workshop
Mon	10/22/2007	Glycolysis	18	PS#5 Due	
Wed	10/24/2007	Glycolysis	18		
<b>Fri</b>	<b>10/26/2007</b>	<b>Exam 3</b>			<b>(Exam 3)</b>
Mon	10/29/2007	TCA Cycle	19		
Wed	10/31/2007	TCA Cycle	19		
					Tracking carbons workshop
Fri	11/2/2007	TCA Cycle Regulation	19		
Mon	11/5/2007	Electron Transport	20		
Wed	11/7/2007	Electron Transport	20		
		Oxidative			
Fri	11/9/2007	Phosphorylation	20		To Be Announced
		Oxidative			
Mon	11/12/2007	Phosphorylation	20	PS#6 Due	
Wed	11/14/2007	Gluconeogenesis	22		
<b>Fri</b>	<b>11/16/2007</b>	<b>Exam 4</b>	<b>20</b>		<b>(Exam 4)</b>
Mon	11/19/2007	Glycogen Metabolism	22		
Wed	11/21/2007	Glycogen Metabolism	22		
Fri	11/23/2007	NO CLASS - HOLIDAY			NO CLASS - HOLIDAY
Mon	11/26/2007	Metabolism Review	18-22		
		Comprehensive Final			
Monday	12/3/2006	Exam	11:00am	To 1:00pm	

## Grading Policy

EXAMS – Exams are predominantly multiple choice. Exams are scheduled on Fridays and Exams start at 11:30am and end at 12:20pm.

Exams utilize scantron #F-1712-PAR-L (a full sized pink form) which students must provide before exam one. Bringing five scantrons (one for each exam) prior to exam one will give you four bonus points on your first exam. Do not fill in your name on the scantrons you bring. Due to students cheating by writing on the forms prior to exams, they must be shuffled and redistributed.

At the end of the semester your lowest exam score will be replaced by the higher of either 1) your final exam score or 2) the average of the other three regular exams. A missed exam will carry a score of 0 and be replaced as described. There are no makeup exams.

PROBLEM SETS – Problem sets are due at the start of lecture on the Monday shown in the schedule. You get to drop one problem set. Late problem sets will suffer a 20% per business day deduction in points. You are allowed (in fact encouraged) to discuss the problem sets with your classmates. The solution you write and turn in must be your own work, however.

FINAL EXAM – The final exam takes place during finals week and is comprehensive. Because our scheduled exam time is only a day and a half before grades are due, anyone missing the exam with a documented emergency will need to take an alternate final within 24 hours of the class final.

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You will receive the same grade in 3361 (lecture) and 3161 (workshop). The grade reported for both will be compiled as follows...

Numerical average	
Problem sets (the lowest one will be dropped)	5 x 30 = 150 pts
Regular Exams	4 x 100 = 400 pts
Final Exam	150 pts
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Total	700 pts

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To get	You must get this percent of the total points				
A+	96.67%	676.7	to	700.0	A+
A	93.33%	653.3	to	676.6	A
A-	90.00%	630.0	to	653.2	A-
B+	86.67%	606.7	to	629.9	B+
B	83.33%	583.3	to	606.6	B
B-	80.00%	560.0	to	583.2	B-
C+	76.67%	536.7	to	559.9	C+
C	73.33%	513.3	to	536.6	C
C-	70.00%	490.0	to	513.2	C-
D+	66.67%	466.7	to	489.9	D+
D	63.33%	443.3	to	466.6	D
D-	60.00%	420.0	to	443.2	D-
F	0.00%	0.0	to	419.9	F

Points will be rounded to the nearest tenth of a point where necessary. Your grade is guaranteed to be at least as high as that shown in the table.

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### Course & Instructor Policies

*(make-up exams, extra credit, late work, special assignments, class attendance, classroom citizenship, etc.)*

It is my experience that the scantron machine, when used properly, does not make errors. For your protection, all scantrons are scanned to a PDF image archive before being returned to students. **DO NOT ATTEMPT TO CHANGE YOUR FORM AFTER IT HAS BEEN GRADED.** This is very easy to catch.

The exam questions are multiple choice and are carefully checked by the teaching faculty prior to the examination. On rare occasion a question may appear where the answer is ambiguous (example, more than one correct answer or no answer is correct) or has alternate correct answers. If you have a strong argument that such a question has appeared, then you may write a written challenge to the question. Such a challenge must be submitted in writing (email is acceptable) to Dr. Haines within 48 hours of the return of your exam. The challenge must be based on your quoting sections of the faculty members lecture notes (on the web site) or the textbook (Garrett and Grisham). What the faculty member says in class on a subject, or in their class notes, will take priority over the textbook when considering a challenge. All challenges will be answered by the faculty in writing, and if the faculty member agrees grades will be modified appropriately. Do not waste your time or ours with challenges that are clearly without merit. This challenge system was created to give you fair grades and to catch the rare ambiguous questions.

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## Technical Support

If you experience any problems with your UTD account you may send an email to: [assist@utdallas.edu](mailto:assist@utdallas.edu) or call the UTD Computer Helpdesk at 972-883-2911.

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## Field Trip Policies

### 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 the website address [http://www.utdallas.edu/BusinessAffairs/Travel\\_Risk\\_Activities.htm](http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm). Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.*

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## Student Conduct & 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 printed 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, Series 50000, Board of Regents, The University of Texas System*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. 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 (SU 1.602, 972/883-6391) and online at <http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html>

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, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the 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.

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.

### **Copyright Notice**

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see <http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm>

### **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 Grade Policy**

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end 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)

[disabilityservice@utdallas.edu](mailto:disabilityservice@utdallas.edu)

If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.

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.

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