



Syllabus

CHEM4313/CHEM5300: Metabolism and Regulation

Fall 2018

Instructor

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Office Hours: Tuesday and Thursday 10:50-11:50 AM

Section Information: Chem 4313-001

Time and Place of Class Meetings: SH331, Tuesday and Thursday 9:30-10:50 AM

Description of Course Content:

Selected topics in metabolic pathways associated with carbohydrates, proteins, nucleic acids and lipid metabolism. This will include biosynthesis and degradation, cellular function, and their regulation and their physiological relevance. Additional topics will include hormones signaling pathways; cell signaling pathways and their metabolic roles and regulation. Emphasis will be given on the physiological relevance on different metabolic pathways including various clinical correlations. Direct examples from current literature will be given on a regular basis.

Student Learning Outcomes:

Upon successful completion of this course, students will be able to understand various metabolic pathways and their regulation and impacts on physiological function and human health. Student will also have learned about fundamentals of cell signaling and their regulatory mechanism.

Required Textbooks and Other Course Materials:

Biochemistry with clinical correlations by Thomas M Devlin, 7th Edition. Please note that additional study materials will be taken directly from current literatures and other resources.

Descriptions of major assignments and examinations:

- There will be four examinations (three mid-terms and one final examination). Mid-term examinations will include materials that are taught before that particular examination. Final examination will be comprehensive and include all the study materials covered during the whole semester.
- There will be multiple homework and quizzes throughout the semester. Students must complete their homework and quizzes on time (will be mentioned during the class).

- c. Undergraduate students are required to do a term paper and a presentation (on their term papers) on a specific topic related to the class and this needs to be discussed and approved by the instructor.

Details on the term paper format will be discussed in the class. **Due date for term paper submission is November 15, 2018** (electronic as well as hard copy). Due date on the topic selection for term paper in October 15, 2018.

Alternatives: Instead of the term paper/presentation, student also participate in a service-learning (SL) project. Details on the SL-project will be discussed in the class.

- d. Graduate students are required to do a research proposal and a presentation (on their proposal) on a specific topic related to the class and this needs to be approved by the instructor.

Details on the research proposal format will be discussed in the class.

Due date for proposal submission is November 15, 2018 (electronic as well as hard copy)
Due date on the topic selection for research proposal in October 15, 2018.

- e. Dates of term paper/research proposal presentation will be discussed and scheduled in the class.

Attendance: I have decided that attendance at class meetings is not required but attendance is a critical indicator in student success, therefore strongly encouraged.

Other requirements and how to do well in this class:

1. Student must submit the assignment on time. Missing classes without appropriate reason and notification may have impact on the final grades.
2. Attend each lecture and study in parallel to the class or in advance. Attending lectures is important because lots of course materials may be taken directly from current literature.
3. Do your home works on time.
4. Select your topics of term paper/research proposal early and start working from the beginning.
Give good presentations.

Grading Policy and Examination:

| | Undergrad | Graduate |
|---|-----------|----------|
| Exam I (25 th September) | 20% | 20% |
| Exam II (23 th October) | 20% | 20% |
| Exam III (27 th November) | 20% | 20% |
| Home assignment/quiz/ | 15% | 15% |
| Term paper/seminar presentations | | |
| Research Proposal and presentation (10 pages) | | |
| Final exam (11 th December, Comprehensive) | 25% | 25% |

Grading Scale:

| Grade | Score (%) |
|-------|-----------|
| A | ≥ 85 % |
| B | ≥ 75 % |
| C | ≥ 65 % |
| D | ≥ 55 % |
| F | < 55 % |

Important Dates:

| | |
|------------|------------------------------|
| Aug 22: | First day of classes |
| Sept 07: | Census Date |
| Nov 02: | Last day to drop or withdraw |
| Nov 21-23: | Thanksgiving Holidays |

Dec 04: Last day of classes
Dec 11: Final exam 8:00 AM - 10:30 AM

COURSE SCHEDULE

Part 1: Structure and properties and metabolism of different biomolecules and organelles with clinical correlations

- A. Amino-acids and protein; Protein domains, post-translational modification; Protein trafficking, Protein degradation and turnover
- B. Nucleic acids
- C. Lipids, membranes and transport
- D. Carbohydrates
- E. Mitochondrial function

Part II: Signal transductions and metabolism with clinical correlations

- A. Cofactors and vitamins
- B. Fundamentals of signal transduction
- C. Bioenergetics and Oxidative metabolism
- D. Carbohydrate metabolism
- E. Lipid metabolism
- F. Amino acid metabolism
- G. Nucleic acids metabolism

Part III: Biochemistry of hormones and nutrients with clinical correlations

- A. Hormones and hormonal cascades
- B. Peptide hormones and amino-acid derived hormones and signaling
- C. Steroid hormones and signaling
- D. Basic nutritional constituents
- E. Clinical correlations

Part IV: Gene regulation, epigenetics and human disease

- A. Chromatin remodeling and transcription through chromatin
- B. Histone modification and histone code hypothesis
- C. Epigenetic mechanism of gene activation and silencing

Part V: Term papers/student presentations

***Note:** The topics will be completed in the sequence shown, and the exams will concern the topics that are listed prior to the exam. However, no accurate day-to-day schedule can be presented due to uncertainties in the time required to present some of the topics, depending on the material included and the time required for classroom discussion. *“As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Subhrangsu S Mandal.”*

NOTES:

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Make-up Exams Policy: There will not be any make-up examinations.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in

the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: for semester-long courses, a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit (location is posted inside the classroom). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Students are encouraged to subscribe to the MavAlert system that will send information in case of an emergency to their cell phones or email accounts. Anyone can subscribe at <https://mavalert.uta.edu/> or <https://mavalert.uta.edu/register.php>

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](#), [major-based learning centers](#), developmental education, [advising and mentoring](#), personal counseling, and [federally funded programs](#). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

The IDEAS Center (2nd Floor of Central Library) offers **free** tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.