Texas A&M University-Texarkana
CHEM 2425: Organic Chemistry II
2014 Spring Semester
T, R 1:00 p.m. – 3:15 p.m., SCIT 201

Course Syllabus

Faculty Office Location and Contact Policy

Instructor Contact Information
Dr. Artem Kireev
Office: Room SCIT 318G (3rd floor), Science and Technology Building
Phone: 903-334-6670
Email: akireev@tamut.edu
Best method of contact is email

Office Hours
In general it has been my policy to be available for help anytime I am at the University. I suggest that if you require extended help outside my normal office hours that you schedule an appointment.
T and R: 4:00 p.m. – 6:00 p.m.

Course Description
This course is the second semester of organic chemistry sequence emphasizing the classes of aliphatic and aromatic compounds that contain oxygen and nitrogen. Prerequisites: CHEM 2423 passed with grade C or better. Course fee required

Required Textbooks/Resources
Highly Recommended


A set of molecular modes will be very useful in helping you to visualize 3-dimensional structures, but are not required. It can also be obtained from the University Bookstore. Molecular models will not be allowed during exams or quizzes. Although molecular models are not required, they are **strongly** recommended. Any Organic Molecular Model Set will do.

**Student Learning Outcomes**
The general outcome goal of this course is to familiarize students with the classification, nomenclature, structure, synthesis, reactions, and reaction mechanisms of carbon compounds including those that contain oxygen and nitrogen. After completion of this course students will be able to:

1. Describe the functional groups and polarity of the molecule of a given organic compound using words, structural and chemical formulas, and physical and computer models;

2. Describe a given hydrocarbon compound as aromatic or aliphatic, ether, epoxide, sulfide, keton, aldehyde, amine, or carboxylic acid;

3. Explain and predict the outcomes of reactions of a given aromatic, allylic and conjugated alkenes and other delocalized electron systems using a molecular orbital model of the pi-bond;

4. Explain and predict the reactivity, solubility, melting point and boiling point of an organic compound using functional groups, structure and polarity;

5. Draw reasonable mechanism of a reaction;

6. Draw structural and chemical formulas using variety of computer programs;

7. Predict nuclear magnetic resonance spectra for a given organic molecule using variety of computer programs;

8. Reproduce in laboratory named reactions;

9. Carry multistep and multicomponent syntheses.

**Course Outline**
Organic Chemistry II is the second semester of a one-year course. The second semester covers the classification, structure, nomenclature, reactions, reaction mechanisms, and synthesis of aromatic compounds, ethers, epoxides, sulfides, ketons, aldehydes, amines, carboxylic and nucleic acids, carbohydrates, amino acids, and proteins. These topics will be delivered via lectures, in class problem solving, and laboratory activities.
Course Requirements
Regular and punctual attendance is of paramount importance. Students are expected to attend all meetings of the class, to arrive at the designated beginning time for the class, and to remain until the designated dismissal time for the class. See Lecture and Lab schedule for details. Authorized absences are granted for students who are approved by the appropriate administrator of the University. Examples of authorized absences include class field trips, University-sponsored workshops, musical performances, and intercollegiate sports participation. Each student is required to take all examinations.

Methods of Evaluation
Each student’s final grade will be based on the following:

<table>
<thead>
<tr>
<th>Graded Components</th>
<th>Points</th>
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<tbody>
<tr>
<td>Weekly Quizzes (10 @ 10 points each)</td>
<td>100</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>100</td>
</tr>
<tr>
<td>Comprehensive Exam</td>
<td>100</td>
</tr>
<tr>
<td>Laboratories (10 @ 50 points each: activities, notebook and lab reports)</td>
<td>500</td>
</tr>
<tr>
<td><strong>Total Possible Points</strong></td>
<td><strong>800</strong></td>
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The comprehensive exam is the ACS test that covers material from both parts of Organic Chemistry. Laboratory activities are designed to help students learn about named reactions, multistep syntheses, and multicomponent syntheses.

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>80-89%</td>
</tr>
<tr>
<td>C</td>
<td>70-79%</td>
</tr>
<tr>
<td>D</td>
<td>60-69%</td>
</tr>
<tr>
<td>F</td>
<td>0-59%</td>
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Make-up Exams

Each student is required to take all examinations. Make-up examinations will be given only if the student has an excused or authorized absence, but students must contact the instructor no later than one week after the missed exam, or after return to campus, to indicate why they were absent and to request to take a make-up. It is the responsibility of the student to inquire as to the procedure for making up an exam. A grade of zero (0) will be recorded if the make-up is not taken in a timely manner. There are no make-ups on quizzes, comprehensive final exam, and other class assignments.
**Assistance**
Each student is encouraged to contact the professor for assistance with any class related problem. To discuss grades or concerns, email or call to make an appointment.

**Academic Integrity**
Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of ‘F’ in the course and/or disciplinary actions. For additional information, see the university policy manual.

**Lecture and Laboratory Rules**
Attendance will be taken daily, either by students signing an attendance sheet or by the roll being called verbally. Each lecture will begin with announcements (if needed) followed by a brief review of information from, and/or questions about, the previous lecture. The roll will be taken immediately after the review, usually no more than 5 minutes into the class period. A student is responsible for the content of any missed laboratory period. Laboratory material will be tested on lecture exams. There will be no make-up laboratories. Anyone not present or not answering the roll call will be considered absent except as follows. Students arriving after the roll is called will be allowed to enter and participate. However, it is their responsibility to sign the tardy sheet that will be available.

**Important!**
- Once you have entered the lecture classroom, do not leave or you will be considered absent. Use the facilities before coming to class.
- Cell Phones: Cell phones are to ‘turned off’ or ‘turned to vibrate’ during both lecture and laboratory and during all tests and exams. No exceptions!

**Methods of Instruction**
- A-V Media/Internet
- Outside assignments
- Demonstration and simulation
- Class discussion
- Laboratory work

**Lecture and Lab Schedule**
All exams and weekly quizzes will be given and completed in class. The ACS test will be given in class during the final week. Lectures and theoretical parts of laboratories will be presented every Thursday. Laboratories will be conducted every Tuesday during regular class meetings. There will be approximately 10 planned laboratories. A lab handout for each upcoming Tuesday lab will be provided on Thursday.

*The worst thing you can do is get behind in this course! Keep up with all assignments.*
Week 1-3   Chapter 14  Ethers, Epoxides, and Sulfides:
(a) Cleavage of an ether by HBr or HI
(b) Acid-catalyzed opening of epoxides in water
(c) Base-catalyzed opening of epoxides
(d) Acid-catalyzed opening of an epoxide in an alcohol solution

Week 4&5   Chapter 15  Conjugated systems, orbital symmetry, and ultraviolet spectroscopy:
(a) Conjugation, molecular orbitals, dienes, allylic cations
(b) Additions to dienes
(c) Diel-Alder reaction, aromaticity

Week 6   Chapter 16  Aromatic Compounds:
(a) Hückel's rule and complex aromatics
(b) Complex aromaticity, application, and nomenclature

Week 7   Midterm Exam

Week 8   Chapter 17  Reactions of Aromatic Compounds:
(a) Electrophilic aromatic substitution: introduction, mechanism, kinetic effects, and directing effects
(b) Halogenation, nitration, sulfonation, alkylation, and acylation
(c) Addition to disubstituted benzenes and synthetic applications
(d) Side chain reactions, retrosynthesis and synthetic applications

Week 9   Chapter 18  Ketones and Aldehydes:
(a) Nomenclature and properties
(b) Synthesis of ketons and aldehydes
(c) Reactions of ketons and aldehydes
(d) The Wittig reaction and alkene synthesis

Week 10   Chapter 19  Amines:
(a) Nomenclature, structure, and properties
(b) Reactions of amines
(c) Diazonium chemistry; amine synthesis by reductive amination of carbonyls
(d) More synthesis of amines

Week 11   Chapters 20 & 21  Carboxylic Acids and Carboxylic Acid Derivatives:
(a) Nomenclature, properties and synthesis
(b) Nucleophilic acyl substitution
(c) Interconversions among acids and derivatives

Week 12   Chapter 22  Condensations and Alpha Substitutions of Carbonyl Compounds:
(a) Keto-Enol tautomerie  
(b) Addition of an enolate to ketones and aldehydes  
(c) Halogenations  
(d) Aldol condensation  
(e) 1,2-Addition and 1,4-Addition  
(f) Claisen reaction  

TBA COMPREHENSIVE EXAM  

Student Participation  

a. Participation Policy: Participation in the course will include attendance at all scheduled meetings, in class problem solving, and collaboration with other students in a group at assigned stations. The collaboration involves implementation of theoretical knowledge in laboratory practice including design of an experiment, conduction of the experiment, and discussion of results.  

b. Course Etiquette: Informal class participation is welcome. Please do not make comments that are off the subject or that impede the progress of the class. Cell phones are to be turned off. Use the facilities before coming to class. Observing safety rules and timely completion of each laboratory session are expected from students.  

c. Discussion Board Standards: Students are expected to visit Blackboard and complete at least one assignment per day. Putting off the extensive information in organic chemistry till the week of a test will only make it harder.  

Disability Accommodations  

Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.  

Leave Policy for Pregnancy and Related Conditions  

Any pregnant students, or students planning to become pregnant, should consult their health care provider to determine what, if any, additional precautions are needed based on their individual situation. It is the responsibility of the student to communicate their needs to the Director of Student Life as soon as possible in order for risk-reduction to begin when it can be most effective, and to determine if additional modifications are necessary. While the university cannot mandate that the student notify it that she is pregnant or is planning to become pregnant, the university strongly recommends that students do provide notification so appropriate steps can be taken to ensure the health of both parent and child. To communicate health circumstances or to request additional information, please contact the Director of Student Life.  

A&M-Texarkana Email Address  

Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on
a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

**Attendance Policy and Course Withdrawal**
Regular and punctual attendance is of paramount importance. You are expected to attend all meetings of the class, to arrive at the designated beginning time for the class, and to remain until the designated dismissal time for the class. Authorized absences are granted for students who are approved by the appropriate administrator of the University. Examples of authorized absences include class field trips, University-sponsored workshops, musical performances, and intercollegiate sports participation. The final drop/withdrawal date for the spring semester is published in the [University Calendar](#).

**University Drop Policy**
To drop this course after the census date (see [semester calendar](#)), a student must complete the Drop/Withdrawal Request Form, located on the University website ([http://www.tamut.edu/Student-Support/Registrar/pdf/Drop_Withdrawal Instructions%20and%20Form.pdf](http://www.tamut.edu/Student-Support/Registrar/pdf/Drop_Withdrawal Instructions%20and%20Form.pdf)) or obtained in the Registrar’s Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an “approval” to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar’s office for processing in person, email [Registrar@tamut.edu](mailto:Registrar@tamut.edu), mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar’s Office for processing. It is the student’s responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.