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Ohio Articulation Number (OAN)
Course Submission Form
2005-2006

College/University Kent State University

Course(s) Submitted(Title & Course #) Basic Organic Chemistry – CHEM20482 for

Ohio Articulation Number OSC010

Date 01/27/06

Name and title of individual submitting on behalf of the college/university

Name Gayle Ormiston Title Associate Provost for Faculty Affairs and Curriculum

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Credit Hours 2 qtr _____ sem 2
Lecture Hours 2
Laboratory Hours _____ (if applicable)
Pre-Requisites(s) Course work (if applicable)
CHEM20481 OR CHEM30481

Placement Score (if applicable)
(Name of test)
(Domain) (Score)

Catalog/Course Description (Includes Course Title and Course #)

Basic Organic Chemistry CHEM 20482 (2 cr h). Continuation of CHEM 20481, emphasizing the chemistry of functional groups prevalent in biological chemistry.

Texts/Outside Readings/Ancillary Materials

"Organic Chemistry", by Francis Carey
"Student Solutions Manual to Accompany Organic Chemistry" by Robert C. Atkins and Francis Carey

Course Objectives and/or Plan of Work

Aromatic Chemistry

Introduction, Structure of Benzene, Overview of reactions (11.1 – 11.5)
Electrophilic substitution, mechanism (nitration, halogenation) (12.1 – 12.6)
Rate and Regioselectivity (12.9 – 12.14)
Multiple Substituents; Planning a Synthesis
Aromaticity, Huckel rule, Aromatic Ions, Heterocyclics (11.18 – 11.22)
Effects of Aromaticity on Acidity/Basicity (22.4, 24.4)
Diazonium Chemistry; azo coupling, sulfonamides, dyes (22.16 – 22.18)
Nucleophilic Aromatic Substitution

C-C Bond Formation

Dienes; Diels-Alder Reaction (10.6 – 10.8; 10.13)
Alkynes; Bonding, Acidity (9.4 – 9.6)
Reactions of Alkynes; Alkylation, Hydrogenation, Hydration (9.6 – 9.12)
Organometallic Chemistry; alkynes as Grignards, cuprate chemistry (14.8; 14.11)
Wittig Reaction (17.12 – 17.13)

Enolate Chemistry

Review keto-enol tautomerism; kinetic vs. TD control; halogenation (18.1; 18.4-5)
Ester Enolates; Claisen Condensation; Dieckmann (21.2 – 21.3)
Acetoacetic ester & Malonic ester; synthetic strategies (21.7 – 8)
α,β-unsaturated systems; Michael reaction; organocopper addition (18.11 – 18.14)
Michael reaction of stabilized anions; synthetic strategies (21.9 and supplemental)

Amine Chemistry

Introduction, Nomenclature, Properties (22.1-22.3)
Preparation of Amines (Gabriel synthesis, reductions) (22.6 – 22.10)
Diazonium transformations (review); Beckman rearrangement
Amines and enolates; Mannich reaction, Stork enamine synthesis
Synthetic Strategies

NMR Spectroscopy

Introduction, chemical shifts & structure (13.1 – 13.5)
^{1}H NMR spectra; spin-spin coupling, splitting patterns (13.6 – 13.11)
Interpretation of ^{1}H Spectra
^{13}C NMR, IR spectroscopy (13.14 – 13.15; 13.20)

Description of Assessment and/or Evaluation of Student Learning

Four In-Class Quizzes (15%), Three Intraterm Exams (60%), Final Exam (25%).

Master Syllabi and Working Syllabi (if both are used)

BASIC ORGANIC CHEMISTRY (20482)
SPRING 2006 COURSE OUTLINE

LECTURE: Monday, Wednesday: 8.50 – 9.40 am; WMH 111
Help session: Thursday 9.00 – 9.55 am; WMH 111

REQUIRED TEXT: ***Organic Chemistry***, F.A. Carey, 6th edition
(McGraw-Hill ISBN# 0-07-282837-4)
The students' solution manual is not required but is a very valuable resource.
Students are also encouraged to purchase a molecular model kit, available at the KSU bookstore and at http://darlingmodels.com/welcome.html

INSTRUCTOR: Dr. Ruth Lawrie
Office: WMH 311C; Laboratory SRL 121
Course Website: http://vista.kent.edu
Phone: 672 9434
E-mail: mlawrie@kent.edu
Office Hours: TBA

ATTENDANCE
Attendance at all class meetings is expected. Students who miss a class are responsible for all materials covered.

COURSE GRADING:
The final grade will be determined as follows:

Class Quizzes	15%
Course Exams	60 %
Final Exam	25%

Grades for exams will not be curved and there will be no extra credit under any circumstances.

Grading Scale:

84 – 100% = A	80 – 83% = A-	
77 – 79% = B+	73 – 76% = B	70 – 72% = B-
65 – 69% = C+	60 – 64% = C	55 – 59% = C-
46– 50% = D+	40 – 45% = D	
0 – 39 % = F		

HOMEWORK
Homework will be assigned regularly but will not be formally assessed. Students are strongly urged to answer these set problems in the help sessions. All model answers will be available on the course website.

The best way (and only way!) to learn and begin to understand organic chemistry is to work through these problems and additional ones if necessary. If you need assistance with any aspect of the course-work be sure to seek help promptly. Help sessions and office hours both provide an opportunity for clarification, and I am always prepared to help students outside these scheduled times when possible.
Help sessions, which will have a discussion/seminar format, are optional, although attendance will greatly benefit your knowledge.

EXAMINATIONS AND QUIZZES
There will be a total of **four quizzes** during the semester, which will last approximately 20 minutes each. The dates of these quizzes will be announced one week in advance.
There will be **three mid-term examinations** during the semester and the examination dates are indicated on the lecture schedule. **All examinations are cumulative**.
Make-up exams will be given **only** for absences due to serious illness or death in the immediate family, at the discretion of the instructor. Students must contact the instructor **within 24 hours** of a missed examination, by e-mail or phone call, to be considered for a make-up exam. At the discretion of the instructor, the student may be given the opportunity to receive a pro-rated grade, based on the semester performance, instead of a make-up exam.
Verification will be required in either case, and it is the student's responsibility to supply **adequate documentation**. Unexcused absences will receive a zero on the exam.
Exam dates are indicated on the lecture schedule.
Examination will be returned to students after students have checked and verified their scores, and model answers will be posted on the course website. Examination questions will be discussed during subsequent help sessions.
The final examination is scheduled for Monday May 8th 10.15 am – 12.30 pm in WMH 111.

ACADEMIC HONESTY
It is the policy of the University that:

(1) Students enrolled at the University are to perform their academic work according to standards set by faculty members, departments, schools and colleges of the University; and
(2) Cheating and plagiarism constitute fraudulent misrepresentation for which no credit can be given and for which appropriate sanctions are warranted and will be applied.

Academic dishonesty includes (but is not limited to) copying material from another student during an exam, quiz or assignment; falsification of data; bringing study notes into an examination or quiz and changing answers on an exam paper which has already been graded.
During class examinations students may not leave the room except in an emergency. For the duration of all examinations and quizzes cell phones must be switched off and placed in **closed** bags. Students may only have approved materials (writing implements, molecular model set, non-programmable calculator) accessible to them. All other items should be left in a closed bag, and bags should be placed at the front of the room or securely tucked under a chair.
Any student caught cheating will be assigned an F for the course, and may be referred to Judicial Affairs, at the discretion of the instructor.

STUDENTS WITH DISABILITIES

In accordance with University policy 3342-3-18, all students with disabilities are to be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Disability Services (contact 330-672-3381 or visit for more information on registration procedures).

TENTATIVE LECTURE AND EXAMINATION SCHEDULE

This lecture schedule is subject to change. Notice of changes will be given in class. It is the student's responsibility to remain up to date; absence from class is no excuse.

Aromatic Chemistry		
Introduction, Structure of Benzene, Overview of reactions (11.1 – 11.5)	Jan 18	
Electrophilic substitution, mechanism (nitration, halogenation) (12.1 – 12.6)	Jan 23	
Rate and Regioselectivity (12.9 – 12.14)	Jan 25, 30	
Multiple Substituents; Planning a Synthesis	Jan 30	
Aromaticity, Huckel rule, Aromatic Ions, Heterocyclics (11.18 – 11.22)	Feb 1, 6	
Effects of Aromaticity on Acidity/Basicity (22.4, 24.4)	Feb 6	
Diazonium Chemistry; azo coupling, sulfonamides, dyes (22.16 – 22.18)	Feb 8, 13	
Nucleophilic Aromatic Substitution	Feb 13	
EXAM 1	**Feb 15**	
C-C Bond Formation		
Dienes; Diels-Alder Reaction (10.6 – 10.8; 10.13)	Feb 20	
Alkynes; Bonding, Acidity (9.4 – 9.6)	Feb 20	
Reactions of Alkynes; Alkylation, Hydrogenation, Hydration (9.6 – 9.12)	Feb 22	
Organometallic Chemistry; alkynes as Grignards, cuprate chemistry (14.8; 14.11)	Feb 27	
Wittig Reaction (17.12 – 17.13)	Feb 27	
Enolate Chemistry		
Review keto-enol tautomerism; kinetic vs. TD control; halogenation (18.1; 18.4-5)	Mar 1	
Ester Enolates; Claisen Condensation; Dieckmann (21.2 – 21.3)	Mar 1, 8	
Acetoacetic ester & Malonic ester; synthetic strategies (21.7 – 8)	Mar 13	
α,β-unsaturated systems; Michael reaction; organocopper addition (18.11 – 18.14)	Mar15	
Michael reaction of stabilized anions; synthetic strategies (21.9 and supplemental)	Mar 20	
EXAM 2	**Mar 22**	
Amine Chemistry		
Introduction, Nomenclature, Properties (22.1-22.3)	Apr3	
Preparation of Amines (Gabriel synthesis, reductions) (22.6 – 22.10)	Apr3	
Diazonium transformations (review); Beckman rearrangement	Apr 5	
Amines and enolates; Mannich reaction, Stork enamine synthesis	Apr 10	
Synthetic Strategies	Apr 12, 17	
EXAM 3	**Apr 19**	

NMR Spectroscopy	
Introduction, chemical shifts & structure (13.1 – 13.5)	Apr 24
^{1}H NMR spectra; spin-spin coupling, splitting patterns (13.6 – 13.11)	Apr 24,26
Interpretation of ^{1}H Spectra	Apr 26, May 1
^{13}C NMR, IR spectroscopy (13.14 – 13.15; 13.20)	May 3
FINAL EXAMINATION	**May 8**

Additional Documentation

OBR Use	Action
Approved	
Additional Information Requested	
Rejected	
Date	

Ohio Articulation Number Form Directions

This form is each institution's OAN course information. This information will be submitted to the Ohio Board of Regents, as part of the faculty review process for each OAN within a given TAG. This document is a locked form, so the only fields that need to be filled in can be opened. When you open this document, make sure the top of the screen, where the name of the document is displayed, says "Document1". The file can be saved in a Word folder or to your desktop and it creates a blank template to fill in. Please fill it in with as much of the requested information as possible. All of the fields in this document are expandable, and will adjust to fit as many characters as you need. Each field is design to accept cut and pastes from other document sources that you may have on campus.

Once you are done filling in your course information, you need to save this file. Since the Word document opened a blank version of this file, you will need to rename is it to save it. Under file, choose "Save as" and then input the name of the file. The naming scheme for this form is Institution-Year-OAN number-Course Title and Number.

Example, if you were ABC Community College, and you were submitting your Calculus I - Math110 course, the name of the file would be ABC-2005-OMT005-Calculus I-Math110. If two (or more) courses are required to fulfill that same OAN, you would submit ABC-2005-OMT005-Calculus I MTH 110 - Calculus II Math 111, and so on for multiple submissions.

When you are done with your submissions, please send them electronically to the Ohio Board of Regents so we can keep your information on file. Please send these to Ora McRae at omcrae@regents.state.oh.us .