

Today's Date: 01/26/2016

Course ID: CHEM V12AL
CC Approval: 04/02/2013
Effective Term: Fall 2013

Ventura College
COURSE OUTLINE OF RECORD

I. Course Information (Printed catalog data elements)

A. Discipline:

Chemistry

B. Course ID:

CHEM V12AL

C. Course Title: General Organic Chemistry I Laboratory

D. Units: 2.00

E. Hours:

Lab/wk: 6.00

Total Semester Contact Hours (based on 17.5 week semester): 105.00

F. Prerequisite(s):

CHEM V12A with grade of C or better or concurrent enrollment

G. Corequisite(s):

None

H. Recommended preparation:

None

I. Enrollment Limitation:

None

J.

Description:

This course covers the utilization of the techniques of experimental organic chemistry, including physical and chemical methods of purification, separation, and structure determination, with an emphasis on synthesis and mechanisms. Infrared spectroscopy and nuclear magnetic resonance are used extensively in this course.

K. Former course ID: Chem 12AL

L. Transfer Status:

CSU Recommended

UC Recommended

II. Course Objectives

- Upon successful completion of this course, the student will be able to demonstrate the following measurable skills and abilities:
 - A. Measure melting points.
 - B. Choose appropriate solvent or solvent mixtures for recrystallization.
 - C. Set up a thin-layer and column chromatography experiment for separation and identification of mixtures,

- and analyze the results.
- D. Set up simple and fractional distillation apparatus to separate mixtures and collect purified samples.
 - E. Carry out a gas chromatographic analysis of mixtures.
 - F. Analyze an unknown using infrared spectroscopy.
 - G. Analyze nuclear magnetic resonance spectra for unknown structure.
 - H. Compose a permanent and intelligent record in a notebook and relate this data in lab reports.
 - I. Handle organic chemicals in accordance to safety rules and dispose of them properly.

III. Course Content

See Lab Content for this stand-alone lab course

Total Lecture Content Hours:

IV. Lab Content:

Experiments:

1. Isolation of an organic compound from a mixture
2. Molecular modeling for organic chemistry
3. Making acetanilide
4. Extraction-separation of a mixture
5. Photoreduction of benzophenone
6. Chemiluminescence of luminol
7. Distillation --simple and fractional
8. Ethanol from sucrose
9. Reactivities of some alkyl halides
10. Synthesis of n-butyl bromide and t-pentyl chloride
11. Cyclohexene
12. Chromatography of some dye mixtures
13. TLC analysis of analgesic drugs
14. Gas chromatographic analysis of gasoline
15. Nucleophilic substitution: competing nucleophiles: S_N1 and S_N2
16. Nitration of methyl benzoate
17. Friedel crafts acylation

Techniques:

1. Melting points
2. Boiling points
3. Extraction
4. Crystallization
5. Chromatography
6. Thin-layer chromatography
7. Fractional and simple distillation
8. Infrared spectroscopy
9. Gas chromatography
10. Electrophilic aromatic substitution
11. Use of drying agents
12. Molecular modeling
13. Nuclear magnetic spectra analysis

105 hours total laboratory content

Total Lab Content Hours:

V. Assignments

A. **Representative In-class Assignments** that develop critical thinking (required for degree applicable courses) may include, but are not limited to:

Student Activities:	Write composition(s) and/or report(s) and/or essay(s)	Write research paper(s) and/or term paper(s) and/or other paper(s)	Solve computational and/or symbolic problems	Conduct and experiment or survey	Engage in analytical discussions	Prepare oral presentations	Develop skills in performance/activities	Create and analyze projects	Other (specify below)
Critical Thinking Skills	Student Activities involved in each skill								
Evaluating	✓		✓	✓	✓	✓	✓		
Appraising and assessing	✓		✓	✓	✓	✓	✓		
Justifying	✓		✓	✓	✓	✓	✓		
Synthesizing	✓		✓	✓	✓	✓	✓		
Developing and formulating	✓		✓	✓	✓	✓	✓		
Analyzing	✓		✓	✓	✓	✓	✓		
Solv problems	✓		✓	✓	✓	✓	✓		
Applying principles	✓		✓	✓	✓	✓	✓		
Comprehending concepts	✓		✓	✓	✓	✓	✓		
Identifying knowledge	✓		✓	✓	✓	✓	✓		
Other (describe): Comments:									

B. Representative Out-of-class Assignments

Reading: Minimum 15 pages per week from lab manual directions and Techniques section.

Writing: Minimum 5 pages per week for detailed lab reports with purpose, procedure, data, results and conclusion prepared both in and out of class.

Problem solving: Approximately 5-6 problems per week in lab reports.

Research: On-line chemical database searches for properties of organic compounds twice per week. Use of CRC Handbook of Chemistry and Physics.

Library Work: -

Skills practice: -

Field trips: -

Other: -

Total Outside Assignments Hours:

VI. Representative Instructional Modes -

Laboratory

Audio Visual Presentations

Class Activities

Collaborative Group Work
Computer-aided Presentation/Assignments
Demonstrations
Independent Study
Lecture/Discussion
Observation
One-on-one conference
Small group activities

VII. Evaluation Methods - Substantively related to the course objectives.

A. Writing.

laboratory report(s)

B. Problem Solving. Computational or non-computational problem-solving demonstrations, including:

exam(s)
quiz(zes)
homework problem(s)
laboratory report(s)

C. Skills demonstrations. Including:

active and informed participation
performance exam(s)

D. Objective examinations. Including:

multiple choice
true/false
matching items
completion

VIII. Textbooks

List representative textbooks, manuals, and other instructional materials/publications, including those materials to be put in the Library/LRC(Learning Resources Center).

Author(s)	Title(s)	Publisher(s)	Date(s)
Pearson Catalyst Manual	Catalyst: Custom Chem 12A Lab Manual	Pearson	2012

Other appropriate publications/instructional materials such as representative recommended readings, repertoire, non-print media (eg., websites, audio/visual recordings), and software.

Other

Other Appropriate Publications:

Discipline-specific websites: Yes

IX. Minimum Qualifications

Chemistry (Masters Required)

X. Student Learning Outcomes

CSLO-1 Synthesize simple organic molecules using modern reaction techniques and analyze the success of each synthesis on the basis of gravimetric, spectroscopic, and chromatographic evidence and physical properties.

CSLO-2 Analyze unknown substances using qualitative Chemical tests and to confirm the analysis using the interpretation of infrared, nuclear magnetic resonance, and gas chromatography-mass spectroscopy