

1/7/2025

DATE

MSD DIVISION



REQUIRED COURSE



NEW COURSE



ELECTIVE COURSE



REVISION

# Lake Land College

## Course Information Form

COURSE NUMBER:	CHM-253	TITLE: (30 Characters Max)		Organic Chemistry Laboratory I							
SEM CR HRS:	1	Lecture:	0	Lab:	3	ECH:	3				
Course Level:	<input checked="" type="checkbox"/> Gen Ed / IAI <input type="checkbox"/> Baccalaureate / Non-IAI		<input type="checkbox"/> Career/Technical <input type="checkbox"/> Dev Ed/ Not in Degree Audit		Clinical Practicum:	0	Work-based Learning:	0	WBL ECH:	0	
COURSE PCS #	11 - 40.0504		IAI Code		CHM 913		Contact Hours (Minutes/Week)				
Repeatable (Y/N):	N	Pass/Fail (Y/N):	N	Variable Credit (Y/N):	N	Min:	Max:	16 Wks	150	8 Wks	300
Prerequisites:	CHM-151										
Corequisites:	CHM-243										
Catalog Description: (40 Word Limit)	Laboratory course introduces synthesis and the basic techniques for the separation, isolation, purification and identification of organic compounds.										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Panacetin separation		3		
Salicylic acid synthesis		3		
IR spectroscopy and mass spectrometry		12		
Banana oil synthesis		6		
Bromobutane preparation		3		
Methylcyclohexenes		3		
Bromine addition		3		
Alkyne synthesis		3		
Vanillin reduction		3		
Pinacol rearrangement		6		
TOTAL	0	45	0	0

EVALUATION			
QUIZZES <input checked="" type="checkbox"/>	EXAMS <input checked="" type="checkbox"/>	ORAL PRES <input type="checkbox"/>	PAPERS <input type="checkbox"/>
LAB WORK <input checked="" type="checkbox"/>	PROJECTS <input type="checkbox"/>	COMP FINAL <input checked="" type="checkbox"/>	OTHER <input type="checkbox"/>

COURSE MATERIALS	
TITLE: Operational Organic Chemistry	
AUTHOR: John W. Lehman	
PUBLISHER: Pearson / Prentice Hall	
VOLUME/EDITION/URL: 4th edition	
COPYRIGHT DATE: 2009	

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		<i>The student will be able to:</i>
Panacetin separation	3	1. Perform basic separation techniques. 2. Demonstrate the use of a separatory funnel. 3. Conduct a separation using a rotovap. 4. Determine melting points.
Salicylic acid synthesis	3	1. Use a reflux as a reaction technique. 2. Conduct acid-base extractions. 3. Perform a recrystallization. 4. Infer reaction success from melting point data.
Infrared spectroscopy and mass spectrometry	12	1. Distinguish and identify functional groups using IR spectra. 2. Interpret mass spectra. 3. Identify unknowns using spectral data. 4. Collect IR spectra using an FT-IR instrument.
Banana oil preparation	6	1. Perform a reaction under reflux. 2. Utilize a simple distillation to purify a liquid product of a chemical reaction. 3. Infer success via IR spectroscopy.
Bromobutane preparation	3	1. Compare SN1 and SN2 reaction pathways. 2. Perform a reaction using short path distillation. 3. Infer success using IR spectroscopy.

Methylcyclohexenes	3	1. Demonstrate an E1 reaction using simple distillation. 2. Describe how Le Chateliers Principle affects equilibrium. 3. Identify reaction impurities through IR spectroscopy.
Bromine addition	3	1. Perform an electrophilic addition to alkene. 2. Demonstrate the addition under reflux technique. 3. Infer success using IR spectroscopy. 4. Identify stereochemistry using melting point data.
Alkyne synthesis	3	1. Synthesize an alkene using an E2 reaction 2. Complete a multi-step synthesis 3. Infer success using IR spectroscopy and melting point data
Vanillin reduction	3	1. Perform a hydride reduction on vanillin. 2. Carry out a reaction in a beaker. 3. Verify hydride addition using IR spectroscopy and melting point.
Pinacol rearrangement	6	1. Perform a reaction under reflux. 2. Purify products using simple distillation. 3. Investigate cation reaction pathways. 4. Identify the presence of two different products using IR spectroscopy.
45		

Outcomes*	At the successful completion of this course, students will be able to:
Course Outcome 1	Employ basic lab techniques such as reflux, distillation, recrystallization, extraction, and separation of organic molecules.
Course Outcome 2	Report detailed observations and results in a "research style" lab notebook.
Course Outcome 3	Assess physical data to formulate scientific conclusions.
Course Outcome 4	Use modern instrumentation.
Primary Laker Learning Competency	Scientific Literacy: Students identify foundational science concepts and apply the scientific process to real-life situations.
Secondary Laker Learning Competency	Creative Thinking & Problem Solving: Students think creatively and solve problems by successfully combining knowledge in new ways.

\*Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.