CHEM TECH	Advanced Chemical Techniques Syllabus	

Contact Info

Instructor	Office	Phone	Email
Dr. Brumbaugh	MCK 341	X 5432	ebrumbau
Dr. Crockett	MCK 307	X 5431	jcrocket
Dr. Fitzgerald	MCK 344	X 8003	sfitzger
Dr. Overway	MCK 319	X 5727	koverway

Course Description: This course encapsulates the senior project for Chemistry Majors. Students will start and complete a year-long research project, make frequent oral presentations, present their results in poster sessions, and complete a scientific report of the project.

Course Credits: 2 credits
Course Meeting: mandatory weekly meeting: Fri 1:00 AM - 1:30 PM in McKinney 337
laboratory work time: to be scheduled with your project instructor (7 hours minimum)

Required Materials :

- *A Short Guide to Writing About Chemistry* by Davis, Tyson, and Pechenik, 1st ed. (ISBN: 978-0-205-60343-5)
- safety goggles
- a laboratory notebook will be supplied by your project instructor

Grading: The overall course grading break-down is as follows:

Graded Items for the Fall	% of Total
lab notebook	30
oral presentations	30
reports (ann. Bib. & Intro.)	25
attendance at weekly meetings	10
standardized exams	5
	100%

Graded Items for the Spring	% of Total
oral presentations	30
attendance at weekly meetings	10
rough draft report	3
rough draft poster	2
final poster	10
final report	10
lab notebook	30
standardized exams	5
	100%

% Earned	Letter Grade	% Earned	Letter Grade
≤ 95.0 %	A	≤ 73.3 %	C
≤ 90.0 %	A-	≤ 70.0 %	C-
≤ 86.7 %	B+	≤ 66.7 %	D+
≤ 83.3 %	B	≤ 63.3 %	D
≤ 80.0 %	B-	≤ 60.0 %	D-
≤ 76.7 %	C+	< 60.0 %	F

Course Objectives/Student Learning Outcomes:
CHEM_Maj01: Inorganic Chemistry National Ranking
CHEM_Maj02: Organic Chemistry National Ranking
CHEM_Maj03: Physical Chemistry National Ranking
CHEM_Maj04: Instrumental Analysis National Ranking
CHEM_Maj05: Internship Praxis

Lab Notebook: Lab notebooks need to be complete in their description of your work and its results. You need to make sure that your project instructor can surmise all of your activities over the entire project by just reading your notebook. Therefore your instructor will check them on a weekly basis. You will turn in your lab notebook every week when we meet as a class. Your instructor will grade them over the weekend and return them to you on Monday. The follow items must be in your notebook on a weekly basis:

1. There MUST be a procedure written in the notebook of what you did. The nature of this class is different than General and Organic Chemistry in that there may not be written instructions for you to follow. Whether you receive your procedures verbally from your instructor or from a written document, you must write down what you do as you do it (NOT LONG AFTER THE FACT!). All equipment, chemicals, volumes, masses, etc. must be included in the procedures. The procedures do not always have to be complete sentences – bulleted lists are fine, just make sure all of the information is there.
2. all pages need to be properly dated and numbered
3. if a blank page needs to be skipped, draw a diagonal line through it and initial it
4. all spreadsheet tables, graphs, and raw data will be printed (or written) and taped into the notebook
5. all computer files associated with the experiment must be identified in the notebook (by filename and location – either diskette or drive location)
6. an updated Table of Contents
7. at the end of each week, you must do the following:
    a. write a one paragraph summary of what was learned from the week's work
    b. state the number of hours worked
    c. write a one paragraph statement of the next week's goals
    d. download (from the course home page) and print the lab notebook checklist and tape it immediately after your summary paragraphs

lab notebook checklist

T.O.C. is updated	_____	out of 5 points
pages are properly dated	_____	out of 5 points
procedures are clear	_____	out of 5 points
proper lab attire was used during work	_____	out of 5 points
data tables and graphs	_____	out of 10 points
weekly summary	_____	out of 10 points
hours worked	_____	out of 10 points
Grade	_____	of 50 points

Oral Presentations: These presentations should be timed for 8-9 minutes, leaving a couple of minutes for questions. Oral presentations should be given using either the chalkboard or PowerPoint in order to provide visual explanations of your project results. Your oral presentation will be graded by faculty and students, with more weight given to the faculty evaluations. The following rubric will be used to evaluate your presentation.

Oral Presentation Rubric

Your name _____ Presenter's name _____

1. stated the purpose of the project	____	out of 3 points
2. explained the theory well	____	out of 5 points
3. results were clear and understandable	____	out of 5 points
4. graphs and data tables were properly formatted	____	out of 5 points
5. did not read from the slides	____	out of 3 points
6. presentation style		
a. hands, posture	____	out of 2 points
b. elocution (vocabulary, "ums", etc.)	____	out of 4 points
7. presentation was visually pleasing/creative	____	out of 3 points
Total Score	____	out of 30 points or _____ %

Poster: At the end of your project (spring semester) you will produce a poster that will be used during the final oral presentation and will be presented at the ACS sectional meeting held at the University of Virginia in late April (see schedule for date). Posters need to include the following sections: Introduction, Experimental, Results, Discussion (Results and Discussion can be combined), and References. Your poster will be evaluated based on the following rubric.

Oral Presentation Rubric

Your name _____ Presenter's name _____

1.	stated the purpose of the project	____ out of 3 points
2.	explained the theory well	____ out of 5 points
3.	results were clear and understandable	____ out of 5 points
4.	graphs and data tables were properly formatted	____ out of 5 points
5.	did not read from the slides	____ out of 3 points
6.	presentation style	
	a. hands, posture	____ out of 2 points
	b. elocution (vocabulary, "ums", etc.)	____ out of 4 points
7.	presentation was visually pleasing/creative	____ out of 3 points
	Total Score	____ out of 30 points or _____ %

Project Report: Your senior project will culminate in a final report which will include the following sections: Abstract, Introduction, Experimental, Results, Discussion (Results and Discussion can be combined), and References. Over the two-semester period, you will begin the process of writing this report by developing an Annotated Bibliography, writing the Introduction section, writing the Experimental section, and then complete the rest of the report by the end of the spring semester.

In early April you will turn in a rough draft of the final report. It should include corrected forms of the Introduction and Experimental sections that have been previously written as well as a substantial Results section. The Discussion section is optional for the rough draft.

The following rubric will be used to evaluate your rough draft.

Project Report Rubric – ***Rough Draft*** Student's name _____

1.	Introduction	
	a. describes why topic is important	_____ out of 4 points
	b. describes pertinent background information	_____ out of 4 points
	c. includes background reading citations	_____ out of 2 points
	d. contains pertinent reactions/equations	_____ out of 5 points
	e. contains the purpose/hypothesis sentence	_____ out of 3 points
	f. format/grammar	_____ out of 6 points
2.	Experimental	
	a. lists the chemicals, solvents	_____ out of 5 points
	b. describe procedures	_____ out of 5 points
	c. lists major pieces of equipment by name; include parameters	_____ out of 5 points
	d. lists any complicating or unexpected factors	_____ out of 2 points
	e. format/grammar	_____ out of 6 points
3.	Results	
	a. steps the reader through all of the tables and figures	_____ out of 5 points
	b. inclusion of all of the tables and figures	_____ out of 15 points
	c. proper figure and table captions	_____ out of 5 points
	d. format of the tables and figures	_____ out of 10 points
	e. final results have proper significant figures	_____ out of 8 points
	f. format/grammar	_____ out of 5 points
4.	References	
	a. follows ACS format	_____ out of 5 points
	b. properly end-noted in the document	_____ out of 5 points
	Total Score	_____ out of 100 points or _____ %

The following rubric will be used to evaluate your final report.

Project Report Rubric – ***Final Report*** Student's name _____

1. Abstract	
a. has thesis statement	_____ out of 2 points
b. states why the study is important	_____ out of 2 points
c. states a summary of results	_____ out of 2 points
2. Introduction	
a. describes why topic is important	_____ out of 4 points
b. describes pertinent background information	_____ out of 4 points
c. includes background reading citations	_____ out of 2 points
d. contains pertinent reactions/equations	_____ out of 5 points
e. contains the purpose/hypothesis sentence	_____ out of 3 points
f. format/grammar	_____ out of 6 points
3. Experimental	
a. lists the chemicals, solvents	_____ out of 5 points
b. describe procedures	_____ out of 5 points
c. lists major pieces of equipment by name; include parameters	_____ out of 5 points
d. lists any complicating or unexpected factors	_____ out of 2 points
e. format/grammar	_____ out of 6 points
4. Results	
a. steps the reader through all of the tables and figures	_____ out of 5 points
b. inclusion of all of the tables and figures	_____ out of 15 points
c. proper figure and table captions	_____ out of 5 points
d. format of the tables and figures	_____ out of 10 points
e. final results have proper significant figures	_____ out of 8 points
f. format/grammar	_____ out of 4 points
5. Discussion	
a. properly interprets the meaning of the results	_____ out of 15 points
b. discusses the uncertainty and reliability of the data	_____ out of 5 points
c. discusses the impact of results on the project's purpose	_____ out of 4 points
d. format/grammar	_____ out of 6 points
6. References	
a. follows ACS format	_____ out of 5 points
b. properly end-noted in the document	_____ out of 5 points

Total Score _____ out of 140 points or _____ %

Course Home Page: There will be a course home page that will contain documents and assignments that you will need to download. You can access the page at http://people.bridgewater.edu/~koverway/courses/CHEMTECH/chemtechhome.htm

Standardized Exams: You will be taking two standardized exams as part of our departmental assessment program. The purpose is to compare your performance to national norms. You will take the full exam in each case, but your score will only be based on the questions that the Chemistry Faculty mark as questions you should know (because they were covered in classes).

Attendance: You are required to attend all of the class sessions. If you cannot be present, you must notify your project instructor in advance. You are allowed one absence (excused or unexcused) without penalty. Each additional absence will result in a loss of 8 points out of 100.

College Honor Code: Ethics, honor, and integrity are the fundamental principles at the core of the Bridgewater College experience. Our community can only flourish in an environment of trust and respect and these notions of personal honor, integrity, and faith are the fundamentals of the Bridgewater Honor System. The Code of Honor prohibits lying, cheating, and stealing and Bridgewater College's commitment to ethics, integrity, and values is embodied in the Code of Ethics. Violation of these Codes demonstrates harm to the community and an all-student Honor Council administers regulation of this Honor System. It is the goal of our Honor Council to assist in the development of students' ethical and moral base (2006-2007 Academic Catalog, Bridgewater College). It may be found at http://bridgewater.edu/WritingCenter/BCplagiarism.htm

Notification of Student Support Services: The Academic Support Center, located in Bicknell House, promotes learning skills and personal development through academic counseling, advising, tutoring services, disability services, and a transition program for selected new students. Further information may be found at http://www.bridgewater.edu/departments/academic_support/

Disabled Students: If you require any special equipment or consideration due to a learning or physical disability, please let the instructor know at your discretion.

CHEM TECH	# Tentative Schedule *Note:* ***This schedule will be adjusted throughout the course to provide for maximum student learning and contextual changes within the community of learners.***	

Day	Date	Topic	Notes	Week
Fri	9/9/2011	Introductions, Style Guide Assignment		1
Fri	9/16/2011	5 minute overview of senior projects	notebooks due	2
Fri	9/23/2011	summer presentations: Matt and Hillary	notebook due	3
Fri	9/30/2011	group lunch	notebooks & Word 2007 Citation exercise due	4
Fri	10/7/2011	grad school/career presentation	notebooks & Annotated Bibliography draft due	5
Fri	10/14/2011	group lunch	notebooks due	6
TBD		***ACS Inorganic Exam - TDB***		
Fri	10/21/2011	group lunch	notebooks due & Annotated Bibliography due	7
Fri	10/28/2011	mid-term project oral presentations	notebooks due	8
Fri	11/4/2011	group lunch	notebooks due	9
Fri	11/11/2011	group lunch	notebooks due	10
Fri	11/18/2011	group lunch	notebooks due; Introduction rough draft	11
Fri	*11/25/2011*	*Thanksgiving Break - no meeting scheduled*		12
Fri	12/2/2011	final oral presentations	notebooks due	14
Fri	12/9/2011	cleanup	Introduction/References section due; notebooks due	15
Fri	1/27/2012	first meeting - brief project updates		1
Fri	2/3/2012	group lunch	notebooks due	2
Fri	2/10/2012	group lunch	notebooks due	3
Fri	2/17/2012	group lunch	Experimental section draft due; notebooks due	4
Fri	2/24/2012	project oral presentations	notebooks due	5
Fri	3/2/2012	group lunch	Experimental section due; notebooks due	6
TBD		***ACS Instrumental Analysis Exam - TBD***		
Fri	*3/9/2012*	*Spring Break - no meeting scheduled*		7
Fri	3/16/2012	Designing posters (Dr. O)	notebooks due	8
Fri	3/23/2012	group lunch	notebooks due	9
Fri	3/30/2012	project oral presentations	poster rough draft due; notebook due	10
Fri	*4/6/2012*	*Easter Break*		11
Fri	4/13/2012	group lunch - first round of clean-up	final poster due; notebook due	12
Fri	4/20/2012	no class - attend the UVA ACS sec. mtg.	project report rough draft due; notebook due	13
Fri	4/27/2012	Poster Session - clean-up finalized	final report due	14