CHEM-112 INFORMATION SHEET (Sections 020D – 025D)
Spring, 2012

Lectures: Every Monday, Wednesday and Friday, 9:05-9:55A.M., Brown Laboratory 101, Dr. John Burmeister

Discussion Sections: Every Friday, as follows:

Section	***Instructor***	***Meeting Time***	***Meeting Place***	***Instructor's Office***
020D	Kaitlin Papson[a]	F 12:20 - 1:10PM	SMI 219	LDL 124
021D	Kaitlin Papson[a]	F 1:25 - 2:15PM	SMI 219	LDL 124
022D	Kaitlin Papson[a]	F 2:30 - 3:20PM	SMI 219	LDL 124
023D	John DiMeglio[b]	F 12:20-1:10PM	SMI 218	BRL 007
024D	John DiMeglio[b]	F 1:25 – 2:15PM	SMI 218	BRL 007
025D	John DiMeglio[b]	F 2:30 – 3:20PM	SMI 218	BRL 007

[a]***Telephone***: 831-1197 and ***E-mail***: kpapson@udel.edu
[b]***Telephone***: 831-0624 and ***E-mail:*** johnd@udel.edu

Help Session:
A weekly help session (day, time, and place to be announced) will be supervised by each of the discussion section instructors. Each of the two UG CHEM-112 Teacher's Assistants will also hold weekly help sessions [Timothy Gilpatrick (BS/BIOC/12), tgilpat@udel.edu, John Tomczak (BS/CHEM/12), jtomczak@udel.edu].

Texts:
Chemistry and Chemical Reactivity (8th ed.), by Kotz, Treichel, and Townsend [UD BA/85] (***KTT***); ***Student Solutions Manual for CCR*** (8th ed.), by Banks; ***Descriptive Inorganic Chemistry*** (5th ed.), by Rayner-Canham and Overton (**RCO**) ***CHEM-112 Personalized System of Instruction*** (2012 ed.), by Burmeister [Additional general chemistry texts, each by a different author, have been placed on reserve in the Reserved Book Room of Morris Library for your use, should you need/desire an alternative to ***KTT*** - see attached list.]

Reading Assignments and Lecture Notes:
Background reading assignments (in ***KTT*** and ***RCO***) and detailed lecture notes will be found in the ***CHEM-112 PSI***. The first ten CHEM-112 PSI modules will be covered sequentially during the Monday and Wednesday lectures. The Friday lectures will usually be devoted to an overview of basic descriptive inorganic chemistry. Notes for these lectures are found in Modules XI and XII.

Problem Assignments:
Problem assignments (drawn from ***KTT, RCO,*** and special problem sets in the ***CHEM-112 PSI***) will be found in the ***CHEM-112 PSI.*** Detailed answers to the problems assigned in the special problem sets will be found in the ***CHEM-112 PSI.*** Brief answers to questions and problems in ***KTT*** are provided in Appendicies N, O, P, Q, and R. Detailed answers to the blue numbered Study Questions in ***KTT*** are shown in the ***Student Solutions Manual.*** Detailed answers to the odd-numbered problems in ***RCO*** will be found in ***RCO's Student Solutions Manual.***

Quizzes:
Short (ca. 25 min.) quizzes will be given during the discussion section periods every week that an "hour" examination is ***not*** scheduled. Coverage will be announced on a week-to-week basis.

"Hour" Examinations:
Exam I - ***Wednesday, March 14, 5:00-7:00 P.M. (SMI 140)*** Material covered between February 6 and March 9, inclusive. Review session will be held on ***March 12, 9:05-9:55 A.M.*** in ***BRL 101.***

Exam II - ***Wednesday, April 18, 5:00-7:00 P.M. (SMI 140)*** Material covered between March 14 and April 13, inclusive. Review session will be held on ***April 16, 9:05-9:55 A.M.*** in ***BRL 101.***

Exam III - ***Tuesday, May 15, 5:00-7:00P.M. (SMI 140)*** NOTE DIFFERENT DAY! Material covered between April 18 and May 11, inclusive. Review session will be held on ***May 14, 9:05-9:55 A.M.*** in ***BRL 101.***

A four year file of past exams, with detailed answers, is included in the ***CHEM-112 PSI.*** The questions in these exams provide an ***excellent*** means for preparing for the current exams, as well as for the quizzes.

Final Examination:
Date, time and place to be announced (Final Exam period: May 17 through May 23). The exam (an ACS Standardized Final Examination) will cover ***all*** of the material dealt with in CHEM-111 and CHEM-112. See attached pages for ordering information and a form for ordering copies of the official Study Guide for the ACS Standardized General Chemistry Final Examination-a purchase that is highly recommended.

Absences from Quizzes and Exams:
Unexcused absences will count as zeroes. Make-up quizzes and exams will be required for ***excused absences***, i.e., those for which an acceptable ***written*** excuse is provided, e.g., illness, death in the family, job conflicts, jury duty.

Grading Policy:

Average of ***all*** quizzes	20%	
Exam I	20%	
Exam II	20%	of final grade
Exam III	20%	
Final Exam	20%	

The following data represent the ***minimum*** overall averages required for the indicated

grades in CHEM-112 during my most recent CHEM-112 duty tours.

			Minimum		
Year	**A**	**B**	**C**	**D**	**Class Average**
1972**	83	73	58	50	73
1973*	76	65	47	39	63
1974**	83	73	53	43	69
1975**	83	73	53	43	73
1976**	81	70	50	40	64
1977**	83	72	53	44	70
1985**	80	70	50	40	62
1986**	80	70	50	40	64
1987**	80	70	50	40	65
1988**	80	70	50	40	62
1989**	80	70	50	40	62
1990**	80	70	50	40	60
1991**	80	70	50	40	60

* Exams given during regular 50 minute class periods.
**Exams given at night; extra time permitted.

The University implemented its +/- grading system in 91F. Accordingly, CHEM-112 course grades have been determined since then as follows:

Course Grade	**Required Performance Level Overall Average**
A	85 and above
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	64-69
C	56-63
C-	50-55
D+	47-49
D	43-46
D-	40-42
F	39 and below

The same scale will be employed in 12S.

Course Evaluation: Your evaluation of your CHEM-112 experience (instructor, TAs and course) will be executed on-line during a two-week period at the end of the spring semester. You will be given detailed instructions in due course.

Burmy Award: A ***CRC Handbook of Chemistry and Physics*** will be given to the student having the highest overall average for CHEM-111/112.

Model Kit: You will find that a molecular model kit for General (not Organic) Chemistry is a very valuable accessory in CHEM-112. You will be permitted to use these model kits (excluding all associated written material) during all relevant quizzes and exams.

Calculator: You will find a non-programmable electronic calculator to be a necessity in CHEM-112.

Course Capture: My CHEM-112 lectures will be automatically digitally recorded by the University's Course Capture system. You will be able to access the audio and video record of the proceedings, via your smart phone and/or laptop, as soon as the lecture has been completed. You will also be able to annotate the lectures electronically, as they are given. Log-in information will be provided in due course.

John L. Burmeister
102 Brown Laboratory
Phone: 831-1130
FAX: 831-6335
Email: jlburm@udel.edu
Appointments: call Linda Staib
BRL 102, 831-2465
Email: lstaib@udel.edu

Texts on Reserve for CHEM-111/112
Reserve Room
Morris Library

Baird, ***Environmental Chemistry***, Freeman (1995)
Brady and Senese, ***Chemistry: Matter and Its Changes***, 4th ed., Wiley (2004)
Brown, LeMay, and Bursten, ***Chemistry: The Central Science***,10th ed., Prentice-Hall (2006)
Burdge and Overby, ***Chemistry:*** Atoms First, McGraw-Hill (2012)
Averill and Eldridge, **Chemistry: Principles, Patterns and Applications** (Vol. 1), Pearson/Benjamin Cummings (2006)
Chang, ***Chemistry***, 7th ed., McGraw-Hill (2002)
Ebbing and Gammon, ***General Chemistry***, 9th ed., Houghton Mifflin (2009)

Fine, Beall, and Stuehr, ***Chemistry for Scientists and Engineers***, Brooks/Cole, (2009)
Gilbert, Kirss, Foster and Davies, ***Chemistry*** (3nd ed.), Norton (2012)
Hill, Petrucci, McCreary and Perry, ***General Chemistry***, 4th ed., Prentice Hall (2005)
Keiter, Mosher, and Scott, ***Chemistry: The Practical Science***, Houghton Mifflin (2008)
Liska, ***Drugs and the Human Body, with Implications for Society***, 4th ed., Macmillan (1994)

*Mahan and Myers, ***University Chemistry***, 4th ed., Benjamin/Cummings (1987)
McMurry and Fay, ***General Chemistry: Atoms First***, Prentice-Hall (2010)
*Munowitz, ***Principles of Chemistry***, Norton (2000)
Silberberg, ***Chemistry: The Molecular Nature of Matter and Change***, 6th Ed., McGraw-Hill (2012)

Spencer, Bodner, and Rickard, ***Chemistry: Structure and Dynamics***, 2nd ed., Wiley (2003)
Tro, ***Chemistry: A Molecular Approach***, Pearson/Prentice Hall (2008)
Whitten, Davis, Peck, and Stanley, ***General Chemistry***, 7th ed., Thomson Brooks/Cole (2004)

*Zumdahl, ***Chemical Principles***, 6th ed., Houghton Mifflin (2009)

*Honors-level text

CHEM-112
2012 Spring Semester (12S = (2123)

Month	Week				Quiz
February	1	6 First Class	8	10	
	2	13	15	17	QI
	3	20	22	24	QII
	4	27	29	2	QIII
March	5	5	7	9	QIV
	6	12	14 Exam I	16	
	7	19	21	23 Mid-term Grade	QV
		26 Spring	--	30 Break	
April	8	2	4	6	QVI
	9	9	11	13	QVII
	10	16	18 Exam II	20	
	11	23	25	27	QVIII
May	12	30	2	4	QIX
	13	7	9	11	QX
	14	14 Last Class	15 Exam III	18 Final Exam	
		21 Final	23 Exams		

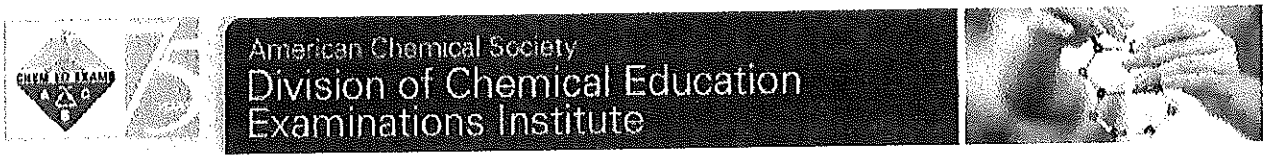
CHEM 112 Course Learning Goals

(Numbers in parentheses indicate the Departmental learning goals (See Department's home page) with which each course goal is aligned.)

After successful completion of this course, a student should be able to:

1. Describe key intermolecular forces and apply this knowledge in connecting molecular structures and physical properties of condensed states. (1)
2. Interpret/construct simple phase diagrams. (1)
3. Discuss the enthalpic, entropic, and external factors involved in solution formation and apply this knowledge in explaining/predicting the behavior of solutions; explain the effects that solutes have on solvent properties, and interpret experimental data/calculate predicted properties based on these effects. (1, 5)
4. Identify species as acids or bases according to various classification systems, and predict/interpret their chemical behavior according to these models (including gas phase, aqueous and nonaqueous solvent conditions). (1)
5. Recognize common organic functional groups, and name/interpret names for simple organic molecules; rationalize/predict products for simple nucleophilic and electrophilic reactions for both inorganic and organic substrates. (1)
6. Interpret/propose experiments and analyze kinetic data to determine reaction orders, rate laws, activation energies and mechanisms; explain/interpret/predict reaction mechanisms based on kinetic data, molecular structure and collision theory. (1, 5)
7. Identify coordination and organometallic complexes and their characteristic features (ligands, geometries, spin states), assign/interpret names and structures, and apply the principles of crystal and ligand field theory in explaining/interpreting/predicting their properties and behavior. (1)
8. Describe and apply fundamental relationships (both qualitative and quantitative) in thermodynamics to simple systems under well-defined conditions, with particular emphasis on energy transfer through heat and work, and changes in enthalpy, entropy and free energy. (1, 5)
9. Explain the distinguishing features of voltaic and electrolytic cells, calculate cell potentials, and use/interpret reduction potential data to explain/predict chemical behavior; discuss key features of different types of batteries and electrolytic processes. (1)
10. Describe different types of nuclear decay processes and calculate associated changes in energy, predict nuclear stability based on nuclear shell model and N/Z ratios, recognize/explain processes of nuclear fusion and fission and their applications, and describe the effects of radiation on matter and common uses of radioactive materials. (1)
11. Be familiar with the properties, uses, and primary reaction chemistry of the main group elements and their compounds. (1)
12. Work together with other students in discussing ideas, evaluating information and formulating solutions to problems. (8)
13. Communicate ideas clearly and effectively in written and oral formats. (10)
14. Find and evaluate sources and information needed in solving problems. (3)

TABLE OF CONTENTS

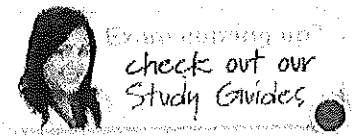


Study Materials

- Study Guide Books
- Practice Exam
- FAQs

Partners

- ACS Division of Chemical Ed
- Journal of Chemical Education
- Chemistry.org



Student Study Materials

Purchase Study Guides Online Now!!

Click Here!!

Students who are going to be taking an ACS Exams Institute exam have study materials available in some areas. The Institute is always working to expand this array of study materials. Right now, there are two printed study guides, with a third to be published in Fall 2009. We are also working on a new form of practice test for students.

Printed Study Guides

Preparing for Your ACS Examination in General Chemistry: The Official Guide

(commonly called the General Chemistry Study Guide)

This guide includes 113 pages of information in essentially three categories. First, there is a brief explanation of content in general chemistry. Second, there are example exam items where the question and answers are analyzed (so you can see not only why the correct answer is correct, but also how the other incorrect answers – called distractors – are devised for a multiple-choice item). Finally, there are practice questions for each section.

Content is derived from both semesters of General Chemistry and includes:

- Atomic Structure
- Molecular Structure and Bonding
- Stoichiometry
- States of Matter / Solutions
- Energetics
- Dynamics
- Equilibrium
- Electrochemistry / Redox
- Descriptive Chemistry / Periodicity
- Laboratory Chemistry

Preparing for Your ACS Examination in Organic Chemistry: The Official Guide

(commonly called the Organic Chemistry Study Guide)

This guide includes 164 pages of information in essentially three categories. First, there is a brief explanation of content in organic chemistry. Second, there are example exam items where the question and answers are analyzed (so you can see not only why the correct answer is correct, but also how the other incorrect answers – called distractors – are devised for a multiple-choice item). Finally, there are practice questions for each section.

Content is derived from both semesters of Organic Chemistry and includes:

- Nomenclature
- Structure, Hybridization, Resonance, Aromaticity
- Acids and Bases
- Stereoisomerism
- Nucleophilic Substitutions and Eliminations
- Electrophilic Additions
- Nucleophilic Addition at Carbonyl Groups
- Nucleophilic Substitution at Carbonyl Groups
- Enols and Enolate Ion Reactions
- Electrophilic and Nucleophilic Aromatic Substitution
- Free Radical Substitutions and Additions
- Oxidations and Reductions
- Spectroscopy
- Synthesis and Analysis

Preparing for Your ACS Examination in Physical Chemistry: The Official Guide

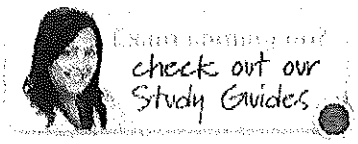
American Chemical Society
Division of Chemical Education
Examinations Institute

Ordering Information

- Pricing List
- Order Form Request

Partners

- ACS Division of Chemical Ed
- Journal of Chemical Education
- Chemistry.org



Ordering Information

How To Order Exams

If you are contemplating ordering any examinations or related materials from the Examinations Institute, you need a price list. You also need an order form, which can be obtained by calling the Exams Institute at 800-854-1672 or by submitting our web form.

- Pricing List
- Order Form Request

How To Order Study Guides

To purchase a copy, contact the American Chemical Society Student Affiliate Chapter at your college or university.

If you can't get the Official Guide there, you can download an order form here. Just fill it out and mail or fax it to us.

- Study Guide Order Form

Purchase Study Guides Online Now!!

STUDENT/FACULTY ORDER FORM 2012

ACS Examinations Institute Study Guides

Bill to:_____

_____

_____

_____

Fax: ( )_____

Purchase Order #_____

Date needed:_____

Ship to:_____

Name:_____

Address_____

_____

_____

Shipping requires physical address.

Phone (required)_____

Submit this *completed* ORDER FORM to us at least 21days before you need Study Guides! Shipping and handling charge will be added. If you order over 10 Study Guides, please call the ACS office to receive additional charge amounts.

Federal Tax ID Number: 42-0935374

All students must prepay by check, money order or credit card. Purchase orders are accepted from Departments only.

Stock Code	Quantity	Description	Each Price	Item Total
GCSG		Preparing for you ACS Examination in General Chemistry	$17	
ORSG		Preparing for your ACS Examination in Organic Chemistry	$21	
PHSG		Preparing for your ACS Examination in Physical Chemistry	$21	
			Total	
			SHIPPING	
			TOTAL DUE WITH ORDER	

Visa and MasterCard accepted. Please charge this order to

❑

❑

Printed Name on Card: _____

Card Number: _____

Billing Address:_____

Expiration: (Month)_____(Year) _____

3-digit CVC2 Code (back of card): _____

Signature: _____

SHIPPING
Allow 5 Business Days for Ground Delivery.

- ❑ Ground ($7.00 for 1)
- ❑ 2nd day ($14.00 for 1)
- ❑ Overnight ($21.00 for 1)

❑ **Payment enclosed.**
Make checks payable to
ACS Exams Institute

For More Information
Call: (800)854-1672
Fax: 515-294-4492
E-mail: chmexams@iastate.edu

WHERE TO SEND YOUR ORDER:

ACS DivCHED Examinations Institute
Iowa State University
0213 Gilman Hall
Ames, IA 50011