

University of Montana

ScholarWorks at University of Montana

Syllabi

Course Syllabi

Fall 9-1-2000

SCI 225.01: General and Chemical Science

David B. Friend

The University Of Montana

David S. Freeman

University of Montana - Missoula

Follow this and additional works at: <https://scholarworks.umt.edu/syllabi>

Let us know how access to this document benefits you.

Recommended Citation

Friend, David B. and Freeman, David S., "SCI 225.01: General and Chemical Science" (2000). *Syllabi*. 5166.

<https://scholarworks.umt.edu/syllabi/5166>

This Syllabus is brought to you for free and open access by the Course Syllabi at ScholarWorks at University of Montana. It has been accepted for inclusion in Syllabi by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

Science 225 GENERAL PHYSICAL AND CHEMICAL SCIENCE Autumn, 2000

INSTRUCTORS: David Friend, Office - SC 127 Phone: 243-5283 E-mail: dbfriend@selway.umt.edu
David Freeman, Office - SB 308 Phone: 243-4772 E-mail: dfreeman@selway.umt.edu

INTERNET SITE: www.physics.umt.edu/sci225

TEACHING ASSISTANTS: Greg Grallo, Deborah McArthur, Brian Boer

LECTURES: 3 one hour lectures/week, MWF at NOON, SC 131

DISCUSSION/LABORATORY PERIODS: 2 two hour sessions/week, TuW in SC 13, ThF in SC 225 229

MAIN REFERENCE: THE PHYSICAL SCIENCES - AN INTEGRATED APPROACH by Hazen and Trefil

GRADING:

EXAMS: Exams 1, 2, and 3 (15% each)	45%
FINAL EXAM: Tuesday, Dec. 19th, 8:00 am . . .	20%
LAB NOTEBOOK:	10%
PROJECT PRESENTATION:	10%
WEEKLY ASSIGNMENTS	10%
QUIZZES	5%

COURSE OUTLINE AND SCHEDULE:

Week 1: Sept. 5 - Sept. 8 (Monday, Sept. 4 - **HOLIDAY**, Labor Day)

LECTURES: Overview: Matter and Energy
DISCUSSION: Introductions, course policies
LAB: "Powers of Ten" video, Math and graph review
READING: Preface (pages v-vii), Chapter 1, Chapter 2 (pages 34-39), Appendix A (pages A-1 to A-7)

Week 2: Sept. 11 - 15

LECTURES: Motion, forces, and mechanical energy
DISCUSSION: Discussion on the scientific process; collecting and presenting data
LAB: Determining density changes in water
READING: Chapter 3 (pages 63-78), Chapter 4 (pages 83-90), Chapter 5 (pages 111-122)

Week 3: Sept. 18 - 22

LECTURES: Gravity, gravitational energy, thermal energy and heat
DISCUSSION: Demonstrations and problems concerning forces and motion
LAB: Measuring velocity, acceleration, force, and acceleration of gravity
READING: Chapter 4 (pages 92-98) and Chapter 5 (pages 122-137)

Week 4: Sept. 25 - 29 (Friday, Sept. 29 - **EXAM 1**)

LECTURES: Thermodynamics
DISCUSSION: Practice exam
LAB: Determination of heat capacities by calorimetry
READING: Chapter 6 (pages 141-162)

Week 5: Oct. 2 - 6

LECTURES: Electricity, magnetism, and electromagnetic energy
DISCUSSION: Electricity/magnetism demonstrations; discussions on uses of electrical energy
LAB: Electric circuits - Using light bulbs as resistors
READING: Chapter 7 (pages 167-196)

Week 6: Oct. 9 - 13

LECTURES: Light, the electromagnetic spectrum, and other wave energy
DISCUSSION: Demonstrations and applications of waves
LAB: Optics - Lenses and image formation
READING: Chapter 8 (pages 201-230)

Week 7: Oct. 16 - 20

LECTURES: Introduction to chemistry, chemical reactions, energy and atomic structure
DISCUSSION: First student project presentations
LAB: Chemical reactions
READING: Chapter 12 (pages 311-320) and Chapter 9 (pages 235-242)

Week 8: Oct. 23 - 27 (Friday, Oct. 27 - EXAM 2)

LECTURES: Atomic structure, chemical properties, and the Periodic Table
DISCUSSION: Practice exam
LAB: Atomic spectra and identification of elements
READING: Chapter 9 (pages 242-260)

Week 9: Oct. 30 - Nov. 3

LECTURES: Chemical bonds and building molecules
DISCUSSION: Chemical compounds and structure of molecules
LAB: Acid-base chemical reactions and antacids
READING: Chapter 11 (pages 285-293)

Week 10: Nov. 6 - 9 (Tuesday, Nov. 7 - HOLIDAY, Election Day) (Friday, Nov. 10 - HOLIDAY, Veteran's Day)

LECTURES: A molecular view of chemical compounds and reactions
DISCUSSION: NO sessions this week
LAB: NO sessions this week
READING: Chapter 11 (pages 293-306) and Chapter 12 (pages 322-328)

Week 11: Nov. 13 - 17

LECTURES: Radioactivity, nuclear forces and nuclear energy
DISCUSSION: Practice Exam
LAB: Separation and purification of substances by chromatography
READING: Chapter 14 (pages 377-406)

Week 12: Nov. 20 (Monday, Nov. 20 - EXAM 3) (Nov. 22 - 24, THANKSGIVING HOLIDAY)

LECTURES: Exam 3
DISCUSSION: NO sessions this week
LAB: NO sessions this week
READING: none

Week 13: Nov. 27 - Dec. 1

LECTURES: Nature and evolution of the stars
DISCUSSION: Planetarium demonstrations and star charts
LAB: Radioactivity simulations
READING: Chapter 21 (pages 611-640)

Week 14: Dec. 4 - 8

LECTURES: The solar system
DISCUSSION: Constructing models of the solar system and comparing the planets
LAB: Relationship between brightness and distance
READING: Chapter 17 (pages 461-489)

Week 15: Dec. 11 - 15

LECTURES: Evolution of the Universe
DISCUSSION: Second student project presentations
LAB: Final practice exam and review
READING: Chapter 22 (pages 645-670)

FINAL EXAM: Tuesday, Dec. 19th, 8:00 a.m. - 10:00 a.m.