

CHEM 400/600A-001
Lecture Schedule New Frontiers of Boron Science Fall 2013

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Required Text: Boron Science: BORON SCIENCE: NEW TECHNOLOGIES & APPLICATIONS, by Hosmane, N. S. (Ed), CRC Press, Boca Raton, FL, **2011** (<http://www.crcpress.com/product/isbn/9781439826621>).

Recommended Additional Texts: CARBORANES, by Grimes, R. N, Academic Press; 2 edition. 2011 (<http://www.sciencedirect.com/science/book/9780123741707>).

*Classes are met every MWe in FW 201 (La Tourette Hall) from 6:00 - 7:15 PM
Office Hours: MWe from 5:00 – 6:00 PM*

August 26 - September 09

Background & Discussion: (1) Writing Publishable-Quality Review Articles, Competitive Proposal Submissions and Presenting Professional-Quality Lectures. (2) Actual Assignments

September 11 - October 02

Part 1: Boron for Living (Chapters 1-12)

Special Emphasis on Medicine, Health and Nutrition, Radioisotope and Boron Neutron Capture Therapy (BNCT).

October 07 – October 23

Part 2: Boron for Electronics (Chapters 13-15)

Boron Derivatives for Applications in Nonlinear Optics, Liquid Crystals and Photoluminescence.

October 28 – November 06

Part 3: Boron for Energy (Chapters 16-20)

Boron Compounds for Hydrogen Storage, Oilfield Technology, Extraction of Radionuclides from High-Level Nuclear Waste, and Space Applications.

November 11 – November 25

Part 4: Boron for Chemistry and Catalysis (Catalysis & Organic Transformations; Chapters 21-29)

Synthesis & Reactivity to Catalytic Applications, Suzuki-Miyaura Couplings, and Weakly Coordinating Anions.

NO CLASSES FROM AUGUST 28 - SEPTEMBER 9 (PREPARATION FOR ASSIGNMENTS)

NO CLASSES FROM NOVEMBER 26 – 29: THANKSGIVING BREAK

GRADING: Each lecture and the proposal will be graded by other graduate students in the class (50% of the Total only) and by the Instructor (50%) independently. In order to avoid more than $\pm 5\%$ discrepancy of grading between the students and the instructor, each grading will be monitored (A penalty of 5 points each will be made to the grader if it happens!). Lecture Presentations can either be in PowerPoint, Chalkboard or Transparency media. There are no separate exams in this course. An additional penalty of 5 points will be computed for each missing lecture.

Two Lecture Presentations: 2 x 200 = 400 points

Review & Proposal Writing: 2 x 100 = 200 points

Oral Presentation: 2 x 100 = 200 points

TOTAL POINTS = 800 (Letter Grading Scale: 720 = A; 640 = B; 560 = C; 480 = D; <480 = F)

	CHEM 400/600A-001	
Lecture Schedule	New Frontiers of Boron Science	Fall 2013
	Lecture Presentation Schedule	

Introduction	August 26	<i>An Overview of Boron Chemistry</i>	<i>Hosmane</i>
Assignments	Aug 28, Sept 4, 9	<i>Preparation for Review article & Proposal</i>	<i>All Students</i>
Chapters 1-12	Sept 11, 16	<i>An Overview of Boron for Living</i>	<i>Hosmane</i>
Chapters 1-3	Sept 16, 18	<i>Boron for Living: Medicine</i>	<i>Student #1</i>
Chapters 4-6	Sept 23, 25	<i>Boron for Living: Health, Nutrition & Radioisotope</i>	<i>Student #2</i>
Chapters 7-12	Sep 30, Oct 02	<i>Boron for Living: Boron Neutron Capture Therapy</i>	<i>Student #3</i>
Chapters 13-15	Oct 07, 09	<i>Boron for Electronics: Optoelectronics</i>	<i>Student #4</i>
Chapters 16-20	Oct 14, 16	<i>Boron for Energy: Energy Storage, Space, Nuclear Waste Disposal & Oilfield Technology</i>	<i>Student #5</i>
Chapters 21-24	Oct 21, 23	<i>Boron for Chemistry & Catalysis: Part-1 – Catalytic Applications</i>	<i>Student #6</i>
Chapters 25-29	Oct 28, 30	<i>Boron for Chemistry & Catalysis: Part-2 – Organic Transformations to Build Other Molecular Assemblies</i>	<i>Student #7</i>

Proposal Submission and Presentation (Nov 4 – Nov 25)

Assignments	Nov 4, 6	<i>Submission & Defense of Review Articles & Proposals</i>	<i>Students 1 & 2</i>
Assignments	Nov 11, 13	<i>Submission & Defense of Review Articles & Proposals</i>	<i>Students 3 & 4</i>
Assignments	Nov 18, 20	<i>Submission & Defense of Review Articles & Proposals</i>	<i>Students 5 & 6</i>
Assignments	Nov 25	<i>Submission & Defense of Review Articles & Proposals</i>	<i>Student 7</i>

Any student who may need an accommodation due to a disability, please make an appointment to see me during my office hours, or when convenient. A letter from Disability Support Services authorizing your accommodations is usually needed before accommodations can be granted.

GENERAL EDUCATION AND COURSE CONTENT OBJECTIVES

General Education Course Objectives

- Improve ability to think critically and logically
- Improve ability to reason quantitatively and to perform basic chemical computations
- Improve ability to interpret mathematical models
- Learn how to use the scientific method and theories to understand chemical phenomena
- Develop an appreciation for the importance of the role of chemistry in everyday life
- Develop an understanding of the historical development of the field of chemistry

Content Objectives of this Course

- Understand the components of atoms and ions
- Learn how to write chemical formulas, and how to name compounds
- Learn how to balance chemical equations and how to perform simple stoichiometry calculations
- Understand the behavior of gases, liquids, and solids
- Become familiar with the electronic structure of atoms and understand how chemical reactivity depends on electronic structure
- Correctly predict the shapes of complex molecules and ions, and become familiar with the theories of chemical bonding.

Grading Guidelines for Lecture Presentation

In-Class Presentation CHEM 400/600A-0001 Fall Semester 2010

Presenter (Name):

Evaluator (Name):

Chapter Topic: Maximum Points: 100

Overall Effectiveness of the Presentation (5 Points Maximum):

Materials/Contents Presented (70 Points):

Structures/Drawings/Figures/Schemes/Tables Used or Shown (5 Points Maximum):

Presentation Media (PowerPoint/Chalk Board/Doc Camera) (5 Points Maximum):

Responses to Questions (15 Points Maximum)

Overall Points (100 Points Maximum):

Date:

Signature:

Critical Comments (if any):

Grading Guidelines for Proposal Evaluation

In the Written Proposal Review, we ask for you to do the following:

- Comment in detail on the quality of the proposal
- Provide an overall rating of the proposal
- Identify the proposal's strengths and weaknesses for each Merit Review Criterion established by the National Science Foundation:

NSF Merit Review Criteria for Proposals

In your review, identify the proposal's strengths and weaknesses for each NSF Merit Review Criterion:

- What is the intellectual merit of the proposed activity?
- What are the broader impacts of the proposed activity?

Below are potential considerations for each criterion. These are only suggestions for evaluation, and not all will apply to any given proposal.

What is the intellectual merit of the proposed activity?

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.)
- To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (such as gender, ethnicity, disability, geographic, etc.)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?

Provide a summary statement that includes the relative importance of the two criteria in assigning your rating. (You do not have to weigh the criteria equally.)

Guidelines for Proposal Preparation

To Prepare your Proposal Application to The NSF Graduate Research Fellowship Program (GRFP), use the following link:
https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane_Help/fastlane_help.htm#fastlane_faqs_introduction.htm

Sample proposal and its written evaluation can be borrowed from Professor Hosmane

Learn how to write a review of literature

(<http://writing.wisc.edu/Handbook/ReviewofLiterature.html>)

- [What is a review of literature?](#)
- [Writing the introduction](#)
- [Writing the body](#)
- [Writing the conclusion](#)