

<b>ORIGINATOR'S SECTION:</b>														
<b>1. College:</b> <input type="checkbox"/> CHABSS <input type="checkbox"/> CoBA <input type="checkbox"/> CoEHHS <input checked="" type="checkbox"/> CSM	<b>Desired Term and Year of Implementation (e.g., Fall 2008):</b> Fall 2017													
<b>2. Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*)</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No														
<b>3. Course will be a variable-topics (generic) course?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ("generic" is a placeholder for topics)														
<b>4. Course abbreviation and Number:* CHEM 504</b>														
<b>5. Title: (Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)</b> <u>Advanced Inorganic Chemistry</u>														
<b>6. Abbreviated Title for PeopleSoft:</b> (no more than 25 characters, including spaces) Adv. Inorganic Chem.														
<b>7. Number of Units:</b> 3														
<b>8. Catalog Description: (Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does <u>not</u> count toward the 80-word limit.)</b>  Surveys of elements and compounds of both the main group and transition series, with an emphasis on rationalizing patterns of structure, stability and reactivity across the periodic table. Applications to catalysis, geochemistry and biochemistry will be introduced. <i>Prerequisite: A minimum grade of C (2.0) in CHEM 404 or classified graduate standing.</i>														
<b>9. Why is this course being proposed?</b>  This course is being proposed as part of the new Masters in Chemistry program. CHEM 504 will serve as a required core course in the option in chemistry.														
<b>10. Mode of Instruction*</b> For definitions of the Course Classification Numbers: <a href="http://www.csusm.edu/academic_programs/curriculumscheduling/catalogcurricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf">http://www.csusm.edu/academic_programs/curriculumscheduling/catalogcurricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf</a>														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Type of Instruction</th> <th style="text-align: center;">Number of Credit Units</th> <th style="text-align: left;">Instructional Mode (Course Classification Number)</th> </tr> </thead> <tbody> <tr> <td>Lecture</td> <td style="text-align: center;">3</td> <td>C-02</td> </tr> <tr> <td>Activity</td> <td></td> <td></td> </tr> <tr> <td>Lab</td> <td></td> <td></td> </tr> </tbody> </table>	Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)	Lecture	3	C-02	Activity			Lab			
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Lecture	3	C-02												
Activity														
Lab														
<b>11. Grading Method:*</b> <input checked="" type="checkbox"/> Normal (N) (Allows Letter Grade +/-, and Credit/No Credit) <input type="checkbox"/> Normal Plus Report-in-Progress (NP) (Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress) <input type="checkbox"/> Credit/No Credit Only (C) <input type="checkbox"/> Credit/No Credit or Report-in-Progress Only (CP)														
<b>12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.</b>														
<b>13. Course Requires Consent for Enrollment?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  <input type="checkbox"/> Faculty <input type="checkbox"/> Credential Analyst <input type="checkbox"/> Dean <input type="checkbox"/> Program/Department - Director/Chair														
<b>14. Course Can be Taken for Credit More than Once?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, how many times?                      (including first offering)														
<b>15. Is Course Crosslisted:</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  If yes, indicate which course                      and check "yes" in item #22 below.														
<b>16. Prerequisite(s):</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                      CHEM 404 or classified graduate standing.														
<b>17. Corequisite(s):</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No														

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BY: \_\_\_\_\_

## 18. Documentation attached:

☐ Syllabus    ☒ Detailed Course Outline

## 19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix:\*

20. How often will this course be offered once established? \* once every year or every 3<sup>rd</sup> semester

## PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:

(Mandatory information – all items in this section must be completed.)

## 21. Does this course fulfill a requirement for any major (i.e., core course or elective

for a major, majors in other departments, minors in other departments)?    ☒ Yes    ☐ No

## If yes, please specify:

Core course in the Chemistry option of the Masters of Science in Chemistry, and an elective in the biochemistry option.

22. Does this course impact other discipline(s)? (If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.)    ☐ Yes    ☒ No

If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Discipline \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_ Support

\_\_\_\_\_ Oppose

Discipline \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_ Support

\_\_\_\_\_ Oppose

## SIGNATURES : (COLLEGE LEVEL) :

M. Schmidt

8/4/2016

1. Originator (please print or type name)

Date

2. Program Director/Chair

Date

3. College Curriculum Committee

Date

4. College Dean (or Designee)

Date

## (UNIVERSITY LEVEL)

5. UCC Committee Chair

Date

6. Vice President for Academic Affairs (or Designee)

Date

7. President (or Designee)

Date

## **Chemistry 504—Advanced Inorganic Chemistry PROSPECTIVE COURSE OUTLINE**

**Dr. Michael H. Schmidt**

[schmidt@csusm.edu](mailto:schmidt@csusm.edu)

321 Science Hall 2

760-750-4138

**Course Description:** A survey of elements and compounds of both the main group and transition series, with an emphasis on rationalizing patterns of structure, stability and reactivity across the periodic table. Applications to catalysis, geochemistry and biochemistry will be introduced.

### **Student Learning Outcomes:**

- Students will be able to use patterns of structure and bonding to identify inorganic compounds, complexes or solids that are likely to be stable.
- Students will be able to use patterns of reactivity to predict the outcomes of chemical reactions for elements throughout the periodic table.
- Students will be able to explain, in clear written English, with diagrams or mathematics where appropriate, why certain compounds, complexes or solids are stable, and why there are predictable patterns of reactivity for different elements.
- Students will be able to use diagrams and calculations to predict properties of inorganic compounds, complexes and solids.

**Textbooks:** F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Murillo, Manfred Bochmann, *Advanced Inorganic Chemistry, Sixth Edition*. New York: John Wiley & Sons, Inc., 1999. (CWMB)

CWMB is a daunting book of over 1300 pages. You won't be reading the whole thing, as it's too much information to digest in one semester, even for grad students. Selected sections of the chapters will be assigned which focus on chemistry that is unique or typical for the elements covered in a given week. For example, in Week 14, we may focus on heteropolymolybdates and heteropolytungstates, high oxidation state compounds used in homogeneous catalysis, and multiple metal-metal bonds, as these are some of the most interesting things that elements 40-43 and 72-75 do.

Other Inorganic Textbooks will be on reserve in the library. Students have almost always found that looking at another textbook's treatment of the same subject is very helpful.

**Course Activities:** Students will take bi-weekly quizzes on the lecture and reading material, and a final exam encompassing the entire semester.

Occasional homework will be given that links the material in each chapter of the book to recently published literature. This homework will model, for the student, the sorts of connections that can be made between the material of the course and the literature. This should help them with the term paper described below.

An end-of-semester term paper of roughly 10 pages will involve students applying concepts of the course to published literature in their own field of interest. This assignment fulfills the All-University Writing Requirement.

**Grading Scheme:**

	# of Items	Pts. Per Item	Total Points
Quizzes	7	20	140
Homework	5	20	100
Term Paper	1	50	50
Final Exam	1	100	100
			390

**Anticipated schedule:** (subject to change)

<u>Lectures</u>	<u>Topics</u>	<u>Readings in CWMB</u>
Week 1	Review of Bonding and Coordination Chemistry	Chapter 1
Week 2	Hydrogen	Chapter 2
Week 3	Groups 1 & 2	Chapters 3 & 4
Week 4	Boron, Group 13	Chapters 5 & 6
Week 5	Carbon, Group 14	Chapters 7 & 8
Week 6	Nitrogen, Group 15	Chapters 9 & 10
Week 7	Oxygen, Group 16	Chapters 11 & 12
Week 8	Halogens, Noble Gases	Chapters 13 & 14
Week 9	Group 12 (Zn, Cd, Hg)	Chapter 15

Week 10	Transition Metal Chemistry	Chapter 16, 16-1 through 16-7
Week 11	Organometallic Chemistry	Chapter 16, 16-8; Parts of Chap. 21
Week 12	First Transition Series, Ti through Mn	Chapter 17, A-D
Week 13	First Transition Series, Fe through Cu	Chapter 17, E-H
Week 14	Lower Transition Series, Zr through Re	Chapter 18, A-D
Week 15	Lower Transition Series, Ru through Au	Chapter 18, E-I