

LSC Use Only No: _____ LSC Action-Date: _____	UWUCC USE Only No. _____ UWUCC Action-Date: _____ Senate Action Date: _____ <i>06-20</i> <i>05-15c W-10-9-06</i>
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Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person: Ruiss Van Fossen Ramsey	Email Address: rvbravo@iup.edu
Proposing Department/Unit: Chemistry	Phone: 7-2360

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

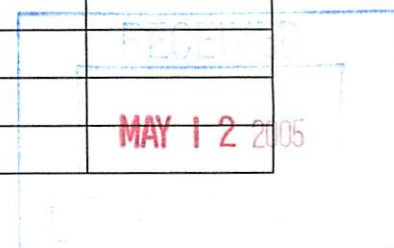
1. Course Proposals (check all that apply)	
<input type="checkbox"/> New Course	<input type="checkbox"/> Course Prefix Change
<input type="checkbox"/> Course Deletion	<input type="checkbox"/> Course
<input type="checkbox"/> Course Number and/or Title Change	<input type="checkbox"/> Catalog Description Change

Current Course prefix, number and full title	Proposed course prefix, number and full title, if changing

2. Additional Course Designations: check if appropriate	
<input type="checkbox"/> This course is also proposed as a Liberal Studies Course.	<input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African)
<input type="checkbox"/> This course is also proposed as an Honors College Course.	
3. Program Proposals	
<input checked="" type="checkbox"/> Catalog Description Change	<input type="checkbox"/> Program Revision
<input type="checkbox"/> New Degree Program	<input type="checkbox"/> Program Title Change
<input type="checkbox"/> New Minor Program	<input checked="" type="checkbox"/> New Track

Current program name	Proposed program name, if changing
	<i>BS in Chemistry/Honors</i>

4. Approvals	
	Date
Dept Curriculum Committee Chair	<i>Wendy Lou Elcessa 5/2/05</i>
Department Chair	<i>Ruiss Van Fossen Ramsey 5/2/05</i>
Coll. Curriculum Committee Chair	<i>[Signature] 5/7/05</i>
College Dean	<i>[Signature] 5/6/05</i>
Director of Liberal Studies *	
Director of Honors College *	
Provost *	
Additional signatures as appropriate:	
(include title)	
UWUCC Co-Chairs	



* where applicable

Part II. Description of Curriculum Change

1. Revised Catalog Description for The Bachelor of Science in Chemistry/Honors Program

Bachelor of Science – Chemistry/Honors Program in Chemistry (1)

Liberal Studies: As outlined in the Liberal Studies section with the following specifications: Mathematics: MATH 123 Natural Sciences: PHYS 131-141 and 132-142 Liberal Studies Elective: 3 cr intermediate-level foreign language		49
Major: Required Courses		47
CHEM 113	Concepts in Chemistry I (2)	4cr
CHEM 114	Concepts in Chemistry II (2)	4cr
CHEM 214	Intermediate Inorganic Chemistry	2cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II	4cr
CHEM 301	Introduction to Chemical Research	1cr
CHEM 321	Quantitative Analysis	4cr
CHEM 322	Instrumental Analysis	4cr
CHEM 341	Physical Chemistry I	4cr
CHEM 342	Physical Chemistry II	3cr
CHEM 343	Physical Chemistry Laboratory I	1cr
CHEM 344	Physical Chemistry Laboratory II	1cr
CHEM 410	Advanced Inorganic Chemistry Laboratory	1cr
CHEM 411	Advanced Inorganic Chemistry	3cr
CHEM 483	Honors Thesis / Independent Study (3)	2cr
CHEM 484	Honors Seminar in Chemistry (3)	2cr
Controlled Electives:		
Additional Chemistry electives from the list: CHEM 521, 531, 535, 540		3cr
Other Requirements:		14-18
BIOL 111	Principles of Biology I	4cr
BIOC 301	Biochemistry I	3cr
MATH 124	Calculus II for Physics, Chemistry and Mathematics	4cr
One additional Mathematics elective from the list: MATH 171, 241, 342		3-4cr
Foreign Language Intermediate Level (4)		0-3cr
Free Electives:		6-10
Total Degree Requirements:		120

1. The honors program in Chemistry is open by departmental permission to Chemistry B.S. majors with a minimum 3.25 cumulative GPA. Students must have at least junior status and must apply no later than the beginning of their senior year
2. CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the chemistry B.S. degree.
3. CHEM 483 and CHEM 484 will each be taken twice for 1 cr each in each of two semesters.
4. Intermediate-level foreign language may be included in Liberal Studies elective.

2. Summary of Changes - NA

3. List of All Associated Course Changes (new or revised courses, number, title, or description changes, and deletions)

Activation of Existing Course

- CHEM 483 Honors Thesis / Independent Study – We wish to activate this course.

New Courses:

- CHEM 484 Honors Seminar in Chemistry

4. Rationale for Changes.

The addition of this track would give outstanding B. S. Chemistry majors the opportunity to earn an “honors” designation on their transcript. It is the intention that this track will encourage students to excel, and reward those who do so. The elective courses already exist in the department. The Honors Thesis/Independent Study (CHEM 483) is taken in place of CHEM 498 so no additional load is required for that. The Honors Seminar (CHEM 484) would require an additional load of 1 credit each semester. This can be covered with current complement. The B. A. in Chemistry majors are not included because these students are being prepared to work in chemistry-related fields and do not take a sufficient number of higher level chemistry courses to qualify for honors in chemistry.

Part III. Implementation

1. **How the Revisions will Affect Students Already in the Existing Chemistry Education Program.**

Changes will not affect students in the existing program, other than that some of these students may be able to graduate with an “honors” designation on their transcript.

2. **How the Proposed Track will Affect Faculty Teaching Loads.**

The proposed track will add an additional hour (1 hr) of load each semester, which can be covered with current complement. Students in this track will take CHEM 483 in place of CHEM 498; the requirements of the students in CHEM 483 are somewhat greater than for CHEM 498, but faculty members will receive independent study compensation for CHEM 483 as they do now for CHEM 498. The seminar (CHEM 484) will require 1 hour of additional load and 1 “prep” each semester. This can be covered with current complement and careful scheduling.

3. **Adequacy of Other Resources.**

Other resources (space, equipment, supplies, travel funds) are expected to be adequate.

4. **Expectation of an Increase or Decrease in the Number of Students as a Result of These Revisions.**

We do not expect the number of B.S. chemistry majors to change as a result of this new program, but some of our B.S. majors will undoubtedly wish to take advantage of this opportunity

5. **Intended Implementation Date – Spring 2006**

6. **Letters of Support – Dean Eck, College of Natural Sciences & Mathematics**

Rick Kutz, Assistant Director, Robert E. Cook Honors College

Part IV. Periodic Assessment

There are several components proposed for the periodic assessment of this track. One is a survey of the senior students completing the track. Another is a five-year re-evaluation of the program by the departmental curriculum committee. Students productivity will also be assessed by examining the quality of theses and presentations of research results both on campus and in professional conferences. Other data, such as student performance on exams and acceptance by graduate schools, will be collected as well.

Senior Survey – A requirement of CHEM 484 will be the completion of a survey by all seniors in this track. The chemistry department secretary will transcribe the results of these surveys, and then the anonymous results will be distributed to the chemistry department faculty.

Five-year Review – The American Chemical Society evaluates the B.S. degree programs for certification every five years. It is proposed that the chemistry department curriculum committee will conduct a formal review of the curriculum two years before this scheduled review. Among the items that the committee should review are: a) the responses from the senior surveys; b) changes in ACS certification requirements; c) comments from colleagues about any potential changes in the degree programs. The ACS has reviewed our program in 2003-2004 and will review it again in 2008-2009, so this process would start in fall 2006, two years before the 2008 ACS review.

Part V. Course Proposals

The following course proposal is part of this package:

- CHEM 484 Honors Seminar in Chemistry

Part VI. Appendices

- Updated Catalog entry for the Department of Chemistry

Dr. Ruiess Van Fossen Ramsey

From: "Dr. Ruiess Van Fossen Ramsey" <rvbravo@iup.edu>
To: "John Eck" <JSECK@iup.edu>
Cc: "Ola Kaniasty" <AKANIAST@iup.edu>; <ENDYW@iup.edu>; "Anne Kondo" <akondo@iup.edu>
Sent: Friday, April 29, 2005 11:04 AM
Attach: honors proposal spring 05.doc
Subject: Chemistry Dept Honors Proposal

Dear Dean Eck,

The Chemistry Department is proposing an honors program/track for the BS Chemistry program. A new course proposed is Honors Seminar, Chem 484, which would require 1 hour of additional load and 1 "prep" each semester.

We would appreciate it if you would send a letter (it may be by email) of support for the proposal. I have attached the track proposal for your examination.

Sincerely,
Ruiess Ramsey

Marcia McCarty

From: "John S. Eck" <JSECK@iup.edu>
To: <rvbravo@grove.iup.edu>; "Ola Kaniasty" <akaniast@grove.iup.edu>
Sent: Friday, May 06, 2005 2:16 PM
Subject: Honors Program in Chemistry

Dear Dr. Ramsey:

The purpose of this email is to express the full support of the College of Natural Sciences and Mathematics for the proposed Honors Program in Chemistry. This program will provide additional opportunities for our students to gain meaningful experiences in chemistry and enhance their overall education here at IUP. Again, it has my unqualified support.

Sincerely,

John S. Eck, Dean
College of Natural Sciences and Mathematics

APPENDIX

Catalog Description for the Department of Chemistry

Catalog Description – Changes in the catalog description **as a result of this proposal** are indicated in italics. Italicizing should be removed for the actual catalog printing.

John Woolcock, Chairperson; Abourahma, Briggs, Eddy, Elcesser, Ford, Ko, Kondo Kupchella, LeBlond, Lake, Long, McElroy, Ramsey, See, Southard, Sowa, Villemain, Wood; and professors emeriti Asting, Bordas, Costa, Crumm, Fazio, Harding, McKelvey, Patsiga, Scroxton, Syty, Tackett, Varughese, Wunz, Zambotti

Website: <http://www.iup.edu/chemistry>

Degrees offered by the Department of Chemistry are the Bachelor of Science in Chemistry, the Bachelor of Arts in Chemistry, and the Bachelor of Science in Education with Chemistry major. The first two degrees are under the College of Natural Science and Mathematics, and the third is under the College of Education and Educational Technology. The department offers formal pre-medical tracks in both the B.S. and B.A. curricula. The department also offers a minor in chemistry.

The B.S. in Chemistry is a professional degree and is certified by the American Chemical Society. The student completing this major should be qualified to assume a position in industry or government as a chemist, or to pursue graduate studies leading to the M.S. or Ph.D. degree in chemistry, biochemistry, materials science, forensic science or an associated field. The B.S. degree, pre-medical track, includes all courses required for entrance into medical school, and gives the student the flexibility of choosing medical school or graduate school after graduation.

An honors program has been developed to enrich the education of qualified B. S. Chemistry majors and to assist students in gaining entrance to graduate school. The core for the program is the same as for the B. S. Chemistry major. Additional requirements are participation in special seminar classes, independent research culminating in an Honors Thesis and oral defense and taking one 500-level graduate course.

The curriculum leading to the B.A. in Chemistry is designed to allow for the workable union of other disciplines with chemistry in such a way as to retain the fundamental science and mathematics requirements needed for a career in chemistry. A careful selection of electives will qualify the student for entrance into many fields in which there is an acute need for persons with scientific training, and, at the same time, satisfy the entrance requirements of various professional and graduate schools. This degree may also be of interest to students who have completed a significant number of semester hours in another degree program, and decide they want to earn a degree in chemistry. As with the B.S. degree, a Chemistry B.A., concentration in pre-medicine, includes all courses required for entrance into medical school.

The B.A. in Chemistry can incorporate a complementary program in almost any other field in the university; some disciplines which make useful combinations include biology, business administration, computer science, criminology (forensic science), English (technical writing), geoscience, government, physics and safety science. In particular, a student seeking a career in forensic science should major in chemistry.

Either degree in chemistry provides excellent preparation for entrance into a variety of professional schools, including dental, veterinary, pharmacy, chiropractic and law. The student considering going to one of these professional schools after completion of a chemistry degree should work closely with their advisor and select additional courses as required by the professional school.

The curriculum leading to the B.S. in Education with Chemistry major is designed to prepare the student to teach chemistry at the secondary school level. Upon completion of the specified coursework and the requirements of the teacher certification process, the student is eligible for Pennsylvania certification by the Pennsylvania Department of Education. The B.S. in Education with a Chemistry major degree program is also certified by the American Chemical Society.

Bachelor of Science – Chemistry

Liberal Studies: As outlined in the Liberal Studies section with the following specifications: Mathematics: MATH 123 Natural Sciences: PHYS 131-141 and 132-142 Liberal Studies Elective: 3cr, no courses with CHEM prefix		49
Major: Required Courses		45
CHEM 113	Concepts in Chemistry I (1)	4cr
CHEM 114	Concepts in Chemistry II (1)	4cr
CHEM 214	Intermediate Inorganic Chemistry	2cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II	4cr
CHEM 301	Introduction to Research	1cr
CHEM 321	Quantitative Analysis	4cr
CHEM 322	Instrumental Analysis	4cr
CHEM 341	Physical Chemistry I	4cr
CHEM 342	Physical Chemistry II	3cr
CHEM 343	Physical Chemistry I Lab	1cr
CHEM 344	Physical Chemistry II Lab	1cr
CHEM 410	Advanced Inorganic Chemistry Lab	1cr
CHEM 411	Advanced Inorganic Chemistry	3cr
CHEM 498	Problems in Chemistry	2cr
Controlled Electives (2)		
Additional Chemistry electives from the list: CHEM 331, 335, 421, 441, 481		3cr
Other Requirements		14-18
BIOL 111	Principles of Biology I	4cr
BIOC 301	Biochemistry I	3cr

MATH 124	Calculus II for Physics, Chemistry and Mathematics	4cr
One additional Mathematics elective from the list: MATH 171, 241, 342		3-4cr
Foreign Language Intermediate Level (3)		0-3
Free Electives		8-12
Total Degree Requirements		120

1. CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the chemistry B.S. degree.
2. Qualifying students can also use 500- or 600-level CHEM courses to meet this requirement.
3. Intermediate-level foreign language may be included as Liberal Studies elective.

Bachelor of Science – Chemistry/Honors Program in Chemistry (1)

<i>Liberal Studies: As outlined in the Liberal Studies section with the following specifications:</i>		49
<i>Mathematics: MATH 123</i>		
<i>Natural Sciences: PHYS 131-141 and 132-142</i>		
<i>Liberal Studies Elective: 3 cr intermediate-level foreign language</i>		
<i>Major:</i>		47
<i>Required Courses</i>		
<i>CHEM 113</i>	<i>Concepts in Chemistry I (2)</i>	<i>4cr</i>
<i>CHEM 114</i>	<i>Concepts in Chemistry II (2)</i>	<i>4cr</i>
<i>CHEM 214</i>	<i>Intermediate Inorganic Chemistry</i>	<i>2cr</i>
<i>CHEM 231</i>	<i>Organic Chemistry I</i>	<i>4cr</i>
<i>CHEM 232</i>	<i>Organic Chemistry II</i>	<i>4cr</i>
<i>CHEM 301</i>	<i>Introduction to Chemical Research</i>	<i>1cr</i>
<i>CHEM 321</i>	<i>Quantitative Analysis</i>	<i>4cr</i>
<i>CHEM 322</i>	<i>Instrumental Analysis</i>	<i>4cr</i>
<i>CHEM 341</i>	<i>Physical Chemistry I</i>	<i>4cr</i>
<i>CHEM 342</i>	<i>Physical Chemistry II</i>	<i>3cr</i>
<i>CHEM 343</i>	<i>Physical Chemistry Laboratory I</i>	<i>1cr</i>
<i>CHEM 344</i>	<i>Physical Chemistry Laboratory II</i>	<i>1cr</i>
<i>CHEM 410</i>	<i>Advanced Inorganic Chemistry Laboratory</i>	<i>1cr</i>
<i>CHEM 411</i>	<i>Advanced Inorganic Chemistry</i>	<i>3cr</i>
<i>CHEM 483</i>	<i>Honors Thesis / Independent Study (3)</i>	<i>2cr</i>
<i>CHEM 484</i>	<i>Honors Seminar in Chemistry (3)</i>	<i>2cr</i>
<i>Controlled Electives:</i>		
<i>Additional Chemistry electives from the list:</i>		3cr
<i>CHEM 521, 531, 535, 540</i>		
<i>Other Requirements:</i>		14-18
<i>BIOL 111</i>	<i>Principles of Biology I</i>	<i>4cr</i>
<i>BIOC 301</i>	<i>Biochemistry I</i>	<i>3cr</i>
<i>MATH 124</i>	<i>Calculus II for Physics, Chemistry and Mathematics</i>	<i>4cr</i>
<i>One additional Mathematics elective from the list:</i>		3-4cr
<i>MATH 171, 241, 342</i>		
<i>Foreign Language Intermediate Level (4)</i>		0-3cr
<i>Free Electives:</i>		6-10
<i>Total Degree Requirements:</i>		120

1. The honors program in Chemistry is open by departmental permission to Chemistry B.S. majors with a minimum 3.25 cumulative GPA and a 3.25 GPA in Chemistry courses.

Students must have at least junior status and must apply no later than the beginning of their senior year

- 2. CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the chemistry B.S. degree.*
- 3. CHEM 483 and CHEM 484 will each be taken twice for 1 cr in each of two semesters.*
- 4. Intermediate-level foreign language may be included in Liberal Studies elective.*

NOTE: This course has not been offered previously so the program below is just a sample of what could be included in the course. The actual course program may vary considerably due to the nature of the course.

CHEM 484 Honors Seminar in Chemistry

Course Goals: The course is designed to expose honors students to a wide variety of research areas and techniques in modern chemistry. Students will:

1. attend, summarize and do critiques of research seminars by external and internal speakers
2. actively participate in research seminars by formulating questions and making suggestions concerning the research
3. present a seminar and written report on either research in the literature or their own research

Student Evaluation

Final letter grades will be based on the following items:

1. 40 % Student seminar presentation & written report
2. 20 % Preparation for seminar presentation
3. 15 % Summaries and critiques of seminars (of others)
4. 15 % Quality of participation in seminar series (of questions and suggestions)
5. 5 % Peer evaluation of performance
6. 5 % Self-evaluation of performance

Minimum percentages of the total to guarantee each letter grade are as follows:

90 – 100 %	A
80 – 89 %	B
70 – 79 %	C
60 – 69 %	D
less than 60 %	F

Student Seminar Presentation

If the student has not previously presented a literature-based seminar, the presentation will be a summary and critique of a published article in the chemical literature. Although a specific article will be the focus of the seminar presentation, additional articles and references will be required in the analysis of the experimentation, data, and results described in the primary article. Students are expected to select an article as early in the semester as possible in order to have sufficient time to prepare their formal seminar presentation.

If the student has already presented a literature-based seminar, the presentation will be based on the research results that the student has to date. It is important to realize that the seminar is not a thesis defense. However, there should be sufficient data collected so as to convey to the audience a focused overview of the research in which the student is currently involved. The student should be able to justify conclusions and explain why the techniques used were appropriate for this research.

ALL students will need to provide a preliminary title by _____. All students will submit an abstract at least one full week before their formal presentation. The dates of each individual presentation will be determined as early in the semester as possible. The presentation may be held on alternate days and/or alternate times from the formal meeting time of the course. The contribution to the Student Seminar Presentation score of each of these parts will be as follows

5 % TITLE

15 % ABSTRACT (due one week prior to the formal presentation)

80% PRESENTATION

Preparation for student seminar presentation:

A preliminary title is due by _____.

A list of appropriate references is due at least two weeks before the presentation. (You may, however, add references after this date). For students presenting a literature-based seminar, the handout "Reading Research Articles" is useful.

An outline of the presentation is due one week prior to the student presentation.

The student is encouraged to practice with presentation styles and options, including PowerPoint, so that the time spent in the preparation of overheads or slides is as productive as possible. This practice will have to take place at times outside of the scheduled class period.

Summaries and Critiques of Seminars:

The student is to submit a summary and a critique of the research seminars on the semester schedule. The student does not have to do a critique of his or her own seminar. The summary/critique CANNOT be simply the notes that are taken during the actual seminar, but is to be a narrative describing the content of the talk, analyzing the quality of the work, and explaining its relevance. Any ethical issues involved in the research should also be addressed in the critique. Each summary is due within two weeks of the seminar presentation chosen.

Pre-Search for known seminar topics and active participation in the seminar series:

The student will find several references relevant to upcoming seminars by outside speakers. A list of these references is required by the Monday of the week of the seminar presentation. The student is then expected to ask quality questions of the seminar speaker and to make suggestions concerning the research. The purpose behind this assignment is to make the student a more active and knowledgeable participant in the seminar series.

Attendance:

Attendance at a minimum of 80% of the seminar presentations throughout the semester is required. Students must provide documentation for any absence. Arrangements to attend seminars in other departments can also be made with instructor approval.

Schedule of Seminar Speakers for this Term*

Date	Speaker	Title of Seminar
Week 1	Dr. James Reilly, Indiana University Bloomington, IN	<i>Using Mass Spectrometry to Identify and Structurally Analyze Biological Molecules and Cellular Constituents</i>
Week 2	Dr. Robert J. Levis, Temple University, Philadelphia, PA	<i>High Speed Detection of Chemical Warfare Agents</i>
Week 3	Dr. Chris Schafmeister, University of Pittsburgh, Pittsburgh, PA	<i>A Chemical Approach to Realizing the Promise of Nanotechnology</i>
Week 4	Dr. Richard Weiss, Georgetown University, Washington, D. C.	<i>Low-Mass organogelators and the Properties of their Gels</i>
Week 5	Dr. John Wood, IUP	<i>Chemical Weapons of Mass Hysteria</i>
Week 6	Dr. Marc Greenburg, Johns Hopkins University, Baltimore, MD	<i>Using Organic Chemistry to Study DNA Damage and Repair</i>
Week 7	Dr. Tomasz Kowalewski, Carnegie Mellon University, Pittsburgh, PA	<i>Novel Nanostructured Materials for Electronics through Self-Assembly of Well-Defined Macromolecules</i>
Week 8	Student Seminars	
Week 9	Student Seminars	
Week 10	Dr. Ann E. Hagerman, Miami University, Oxford, OH	<i>Dietary Polyphenolics as Antioxidants</i>
Week 11	Dr. Kara Bern, University of Rochester, Rochester, NY	<i>Impact of Dynamics on Redox Protein Stability and Function</i>
Week 12	Dr. Theresa M. Reineke, University of Cincinnati, Cincinnati, OH	<i>A Structure-Property Study of New Materials Designed for the Delivery of Gene Therapeutics</i>
Week 13	Student Seminars	
Week 14	Student Seminars	

* Note: These are actual speakers and topics that have been or will be presented in other seminars of the Chemistry Department.

DISCLAIMER: This is a sample program for Chem 484. It is not a program that has actually been presented in this course because the course has never been offered before.