

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		08-146.	AP-9/16/08	App-10/7/08

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person Anne Kondo	Email Address akondo@iup.edu
Proposing Department/Unit Chemistry	Phone 74595

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) ☐ New Course ☐ Course Prefix Change ☐ Course Deletion ☐ Course Revision ☐ Course Number and/or Title Change ☐ Catalog Description Change		
<u>Current</u> Course prefix, number and full title		<u>Proposed</u> course prefix, number and full title, if changing
2. Additional Course Designations: check if appropriate ☐ This course is also proposed as a Liberal Studies Course. ☐ Other: (e.g., Women's Studies, Pan-African) ☐ This course is also proposed as an Honors College Course.		
3. Program Proposals ☐ New Degree Program ☐ Program Title Change ☒ Program Revision ☐ New Minor Program ☐ New Track ☐ Other		
B.S. Chemistry/PreMed track		
<u>Current</u> program name		<u>Proposed</u> program name, if changing
4. Approvals		
Department Curriculum Committee Chair(s)	<i>Wendy Lou Elcesse</i>	11/28/07
Department Chair(s)	<i>John W. Balach</i>	11/28/07
College Curriculum Committee Chair	<i>[Signature]</i>	04/04/08
College Dean	<i>[Signature]</i>	11-2-08
Director of Liberal Studies *	<i>Thuy Sala</i>	9-23-08
Director of Honors College *		
Provost *	<i>Gerard V. Leman</i>	8/29/08
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs	<i>Gail S. Schust</i>	9/22/08

* where applicable

Received
 SEP 22 2008
 Liberal Studies

Received
 SEP 04 2008
 Liberal Studies

Received
 APR 04 2008
 Liberal Studies

Part I. Curriculum Proposal Cover Sheet

Part II. Description of Curriculum Change

1. Catalog description for the revised program in the appropriate form. This includes both the description about the program and the list of courses and credits for the revised program.

Chemistry/Pre-Medical Track **Bachelor of Science**

Degrees offered by the Department of Chemistry are the Bachelor of Science with a Chemistry major, the Bachelor of Science with a Chemistry/Pre-Medical Track, the Bachelor of Arts with a Chemistry major, and the Bachelor of Science in Education with a Chemistry major. A Pre-Medical concentration is available in the B.A. curricula. Preparatory programs for other professional schools can be developed for either degree. A minor in chemistry is also offered.

The B.S. degree with a Chemistry major 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 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.

The curriculum leading to the B.A. degree with a Chemistry major 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. The Pre-Medical concentration includes all courses required for entrance into medical school.

The B.A. degree with a Chemistry major 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 his or her advisor and select additional courses as required by the professional school.

The curriculum leading to the B.S.Ed. degree with a 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.Ed. degree with a Chemistry major program is also certified by the American Chemical Society.

Bachelor of Science–Chemistry/Pre-Medical Track

Liberal Studies: As outlined in Liberal Studies section with the following specifications: Mathematics: MATH 125, Natural Science: PHYS 131-141 and 132-142 Liberal Studies Electives: MATH 126		48
Major:		45
Required Courses:		
CHEM 113	Concepts in Chemistry I	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 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 498	Problems in Chemistry	2cr
Controlled Electives: (2)		
Additional Chemistry electives from the following: CHEM 331, 335, 421, 441, 481		3cr
Other Requirements:		23-27
BIOC 301	Biochemistry I (3)	3cr
BIOL 111	Principles of Biology I	4cr
BIOL 151	Human Physiology	4cr
BIOL 263	Genetics	3cr
BIOL 331	Animal Developmental Biology	3cr
MATH 225	Calculus III	3cr
One additional mathematics elective from the following: MATH 171, 216, 241, 342		3-4cr
Foreign Language Intermediate Level		0-3cr
Free Electives:		0-4
Total Degree Requirements:		120
(1) CHEM 111 and 112 can be substituted for CHEM 113 and 114. (2) Qualifying students can also use 500- or 600-level CHEM courses to meet this requirement. (3) CHEM 351 may be substituted for BIOC 301.		

2. Summary of changes: Table comparing old and new programs.

Bachelor of Science— Chemistry/Pre-Medical Track (Current)	
Liberal Studies: As outlined in Liberal Studies section with the following specifications: Mathematics: MATH 123 Natural Science: PHYS 131-141 and 132-142 Liberal Studies Electives: 4 cr, MATH 124, no courses with CHEM prefix	50
Major:	45
Required Courses:	
CHEM 113 Concepts in Chemistry I	4cr
CHEM 114 Concepts in Chemistry II	4cr(1)
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 498 Problems in Chemistry	2cr
Controlled Electives (2)	
Additional Chemistry electives from the following:	
CHEM 331, 435, 421, 441, 481	3cr
Other Requirements:	20-25
BIOC 301 Biochemistry I (3)	3cr
BIOL 111 Principles of Biology I	4cr
BIOL 151 Human Physiology & Anatomy	4cr
BIOL 263 Genetics	3cr
BIOL 331 Animal Developmental Biology	3cr
One additional mathematics elective from the following:	
MATH 171, 241, 342	3-4cr
Foreign Language	0-4cr
Intermediate Level (3)	
Free Electives:	0-5
Total Degree Requirements:	120

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114.
- (2) Qualifying students can also use 500- or 600-level CHEM courses to meet this requirement.
- (3) CHEM 351 may be substituted for BIOC 301.

Bachelor of Science — Chemistry/Pre-Medical Track (Revised)	
Liberal Studies: As outlined in Liberal Studies section with the following specifications: Mathematics: MATH 125 Natural Science: PHYS 131-141 and 132-142 Liberal Studies Electives: MATH 126, no courses with CHEM prefix	48
Major:	45
Required Courses:	
CHEM 113 Concepts in Chemistry I	4cr
CHEM 114 Concepts in Chemistry II	4cr(1)
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 498 Problems in Chemistry	2cr
Controlled Electives (2)	
Additional Chemistry electives from the following:	
CHEM 331, 335, 421, 441, 481	3cr
Other Requirements:	23-27
BIOC 301 Biochemistry I (3)	3cr
BIOL 111 Principles of Biology I	4cr
BIOL 151 Human Physiology & Anatomy	4cr
BIOL 263 Genetics	3cr
BIOL 331 Animal Developmental Biology	3cr
MATH 225 Calculus III for Physics, Chemistry, Mathematics	3cr
One additional mathematics elective from the following:	
MATH 171, 216, 241, 342 3-4cr	
Foreign Language	0-3cr
Intermediate Level (3)	
Free Electives:	0-4
Total Degree Requirements:	120

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114.
- (2) Qualifying students can also use 500- or 600-level CHEM courses to meet this requirement.
- (3) CHEM 351 may be substituted for BIOC 301.

- 2b. List of all associated course changes (new or revised courses, number, title, or description changes, and deletions).
Replaced: MATH 123 (4cr Liberal Studies Math) with MATH 125 (3 cr Liberal Studies Math)
Replaced: MATH 124 (4 cr Liberal Studies Elective) with MATH 126 (3cr Liberal Studies Elective)
Added: MATH 225 (3cr) under Other Requirements
Corrected: CHEM 435 with CHEM 335 under Controlled Electives
Added: MATH 216 under Other Requirements, Math elective

3. Rationale for Change

The Math Department replaced its two four credit calculus courses with three three-credit calculus courses. Since these courses are required in our program, we revised it accordingly.

The current catalog has a typo. CHEM 435 does not exist. The catalog should list CHEM 335, Advanced Organic Chemistry, under Controlled Electives.

MATH 216, Probability and Statistics for Natural Sciences, is a suitable math course for Chemistry majors; many of our students submit requests (which are granted) to use MATH 216 as their math elective.

Part III. Implementation. Provide answers to the following questions:

1. How will the proposed revision affect students already in the existing program?
MATH 123 and MATH 124 were offered again this year. Existing students are being advised to complete their calculus requirements Fall 2007 and Spring 2008. Those who fail to do so will have to take the new calculus sequence.
2. Are faculty resources adequate? If you are not requesting or have not been authorized to hire additional faculty, demonstrate how this course will fit into the schedule(s) of current faculty.
This change has no impact on our faculty resources.
3. Are other resources adequate? (Space, equipment, supplies, travel funds)
This change has no impact on our resources.
4. Do you expect an increase or decrease in the number of students as a result of these revisions? If so, how will the department adjust?
We hope that the calculus change, which may better prepare students for upper level chemistry courses, will help with student retention. We do not expect a better retention level to require an increase in course sections.

Part IV. Periodic Assessment

Departments are responsible for an on-going review of curriculum. Include information about the department's plan for program evaluation:

1. Describe the evaluation plan. Include evaluation criteria. Specify how student input will be incorporated into the evaluation process.
This revision is not expected to change the existing evaluation process, which includes the department student learning outcomes assessment survey, the five-year department evaluation and the American Chemical Society accreditation review.
2. Specify the frequency of the evaluations.
Evaluations occur annually as part of our department student learning outcomes assessment plan.
3. Identify the evaluating entity.
Student Learning Outcomes assessment survey.

Part V. Course Proposals

CHEM 341 has a revised catalogue description due to the change in prerequisites from the old calculus courses, MATH 123 and MATH 124 to MATH 125, 126 and 225.

Part VI. Letters of Support or Acknowledgement

Letter from Gary Stoudt, Chair, Mathematics.

Anne E. Kondo

From: "Gary Stoudt" <Gary.Stoudt@iup.edu>
To: "Anne E. Kondo" <akondo@iup.edu>
Sent: Tuesday 27 November 2007 1:55 PM
Subject: RE: Chemistry/Calc Revisions

Anne,

The Mathematics Department supports the revisions to the BA Chemistry, BS Chemistry, BSEd Chemistry Education, and BS Chemistry/Pre-Med programs, and the corresponding course prerequisite changes in CHEM 340 and CHEM 341. We appreciate the Chemistry Department's willingness to work with us on changing the calculus sequence for science majors. I know from our point of view it was good for us to have a dialogue with you on this matter. These changes will not have any resource implications for us and we hope that the new calculus sequence will serve the needs of all of our students.

Gary

Gary Stoudt
Mathematics Department

From: Anne E. Kondo [mailto:akondo@iup.edu]
Sent: Tuesday 27 November 2007 12:55 PM
To: gsstoudt@iup.edu
Cc: Wendy Elcesser
Subject: Chemistry/Calc Revisions

Dear Gary,

Attached, please find program revisions to our BA-CHEM, BS-CHEM, BS-CHEMED and BS-CHEM/PREMED and a course revision for CHEM 341 (pre-requisite change) that incorporate the changes in the math calculus sequence. We would appreciate a letter of support. Thank-you,

Sincerely,

Anne Kondo

Dept. Chemistry

Curriculum Committee member

11.28.2007