

Bachelor of Science Chemistry Pre-medical Track-PrgRsv-2015-10-21

- The workflow icon is no longer available. Please click on the Page Status after the orange circle icon near the page title. *

Form Information



First Step: Change the text in the [brackets] so it looks like this: **Bachelors in Criminology Pre-Law-PrgRsv-2015-08-10**

Second Step: Click save on bottom right

Third Step: Make sure the word "**DRAFT**" is in yellow at the top of the proposal

Fourth Step: Click on **EDIT CONTENTS** and start completing the template. When exiting or done, click save on bottom right

When ready to submit click on the workflow icon and hit approve. It will then move to the chair as the next step in the workflow.

Please direct any questions to curriculum-approval@iup.edu

**Indicates a required field*

Proposer*	Ronald See	Proposer Email*	rfsee@iup.edu
Contact Person*	Ronald See	Contact Email*	rfsee@iup.edu
Proposing Department/Unit*	Chemistry	Contact Phone*	7-4489

Program Revision Options (Check all that apply)

Program Revision

** Teacher Education: Please complete the Teacher Education section of this form (below)*

** Liberal Studies: Please complete the Liberal Studies section of this form (below)*

Course Level:*

undergraduate-level

Rationale for Proposed Changes

(A) Why is the program being revised?*

Existing program is inflexible and requires over 60cr. Proposed program increases flexibility for the student, meets the needs for medical school admission, and retains the option of gaining an ACS certified degree.

(B) Identify the Program Student Learning Outcomes

Student Learning Outcomes for the Bachelor of Science – Chemistry / Pre-medical Track

Students graduating from this program will:

Objective 1:

demonstrate preparation for application to medical school, graduate school in chemistry or employment in the chemical industry.

Rationale:

Curriculum has been designed with emphasis on meeting the specific expectations of medical schools, but also incorporates the courses expected by graduate schools of chemistry and chemical employers.

Objective 2:

demonstrate the ability to analyze data and scientific arguments.

Rationale:

Course content throughout the program, in both lecture and laboratory courses, support this objective by requiring students to respond to questions at the application, analysis and synthesis levels.

(SLO). Mark any SLOs that are changing as a

part of the Program Revision.*

Objective 3:

show the ability to synthesize and apply concepts from multiple sub-disciplines of chemistry.

Rationale:

Course content in the advanced chemistry courses requires a foundation knowledge across the breadth of chemistry. Advanced courses, seminar courses and undergraduate research require students to apply concepts from a variety of courses in novel ways.

Objective 4:

be able to work with peers to solve complex, multi-step problems.

Rationale:

Starting with General Chemistry, all chemistry lecture courses require higher-level quantitative problem-solving ability. In laboratory courses, students often work in small groups, and are required to transfer the problem-solving strategies learned in the classroom to real-world, hands-on situations.

Objective 5:

demonstrate the ability to communicate answers and scientific reasoning clearly, in both written and oral forms.

Rationale:

Laboratory reports and oral presentations require students to learn and master the ability to communicate in the context of scientific discourse.

Objective 6:

have progressively developed effective and safe chemistry laboratory skills that require the methods and instrumentation of modern chemistry.

Rationale:

As students progress, laboratory course content requires an increasing level of synthesis and evaluation, with a greater emphasis on procedure development and independent thinking. Throughout the laboratory experience, safety is stressed and students are expected to critically analyze procedure for safety and effectiveness.

Objective 7:

demonstrate, during their undergraduate research experience, the ability to: evaluate novel results; self-direct their activities; apply their knowledge in an integrated scientific context.

Rationale:

Undergraduate research represents the capstone experience for chemistry majors, synthesizing the knowledge and experience of a student's lecture and laboratory courses in the context of a novel scientific problem.

Assessment

There are three components proposed for the periodic assessment of this degree program:

Senior Survey – A questionnaire will be given to students who are in the last semester of their degree program. This questionnaire will address the graduates' perceptions of whether they have achieved the program learning outcomes set by the Chemistry Department. It will also have the students indicate where they plan to go once they leave IUP, and the strengths and weaknesses of the program.

DUCK Exam - Students in their last semester will be given the Diagnostic of Undergraduate Chemical Knowledge (DUCK) exam provided by the American Chemical Society's Exam Institute. The student's scores will be compared to the published national norms for this exam.

	<p><i>Five-year Review</i>– The American Chemical Society evaluates the B.S. degree programs for certification every five years and requires an interim report every year. The Chemistry Department will carefully consider for implementation, the recommendations of the American Chemical Society Committee on Professional Training. The five-year ACS review is a thorough examination of program content by a uniquely qualified extramural agency. The review results in specific recommendations for improvement when weaknesses are detected. Since continued certification of the program depends on the outcomes of this review, it represents a very important means of assessment.</p>
<p>(C) Implications of the change on the program, other programs and the Students:*</p>	<p>Due to the increased flexibility of the proposed program, it is hoped that more students elect this degree track. We do not anticipate any significant impact of this change on programs outside chemistry.</p>

Current Program Information		Proposed Changes	
<p>(D) C u r r e n t P r o g r a m T i t l e*</p>	<p>Bachelor of Science - Chemistry/Pre-medical Track</p>	<p>P r o p o s e d P r o g r a m T i t l e</p>	<p><i>(i f c h a n g i n g)</i></p>

<p>(E C u r r e n t N a r r at ive C a t a l o g D e s c r i p t i o n It is a c c e pt ed for the c u rr e nt at al o g r a m y.</p>	<p>UG Course Catalog: http://www.iup.edu/registrar/catalog/</p> <p>Grad Course Catalog: http://www.iup.edu/graduatestudies/catalog/</p> <p>Degree programs offered by the Department of Chemistry are the bachelor of science program in chemistry, the bachelor of science program in chemistry/pre-medical, the bachelor of arts program in chemistry, and the bachelor of science in education program in chemistry. A Pre-medical concentration is available in the BA curricula. Preparatory programs for other professional schools can be developed for either degree. A chemistry minor is also offered.</p> <p>The BS degree in chemistry is a professional degree and is certified by the American Chemical Society. The student completing this degree should be qualified to assume a position in industry or government as a chemist or to pursue graduate studies leading to the MS or PhD 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.</p> <p>The curriculum leading to the BA degree 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 people 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 credits 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.</p> <p>The BA degree program in chemistry can incorporate a complementary program in almost any other field in the university; some disciplines that 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.</p> <p>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.</p> <p>The curriculum leading to the BSEd degree in chemistry is designed to prepare the student to teach chemistry at the secondary school level. Upon completion of the specified course work and the requirements of the teacher certification process, the student is eligible for Pennsylvania certification by the Pennsylvania Department of Education.</p>	<p>P r o p o s e d P r o g r a m</p> <p>Degree programs offered by the Department of Chemistry are the Bachelor of Science (BS) in chemistry, the Bachelor of Arts (BA) in chemistry and the BS in education in chemistry. Additionally, pre-medical and pre-pharmacy tracks are available in the BS program. Preparatory programs for other professional schools can also be developed, using the BA degree, and a chemistry minor is offered.</p> <p>Chemistry is a field that has historically enjoyed very strong career possibilities. Many students are employed directly after their undergraduate education by the chemical, pharmaceutical or related industries, in jobs that have excellent career prospects. Graduate school in chemistry or biochemistry usually includes very generous financial support, and can lead to outstanding career paths in industry, government or academic areas. These opportunities are available to students completing any of the degree programs offered by the IUP Department of Chemistry, and graduates of these programs have gone on to industrial leadership positions, and some of the most prestigious graduate programs in the country.</p> <p>The BS degree in Chemistry is designed for a student intending a career in chemistry and is certified by the American Chemical Society. The advanced courses and strong laboratory component in this degree program gives the student excellent preparation for the challenges of employment or graduate school.</p> <p>The Pre-medical and Pre-pharmacy tracks of the BS degree allow students to take all courses required for entrance into their intended professional health program, and gives them the flexibility to tailor their program to meet their individual needs. Students in these tracks retain the option of: a) attending medical or pharmacy school; b) attending graduate school in chemistry, biochemistry, pharmacology, or a variety of medically-related Ph.D. programs; c) employment in the chemistry or pharmaceutical industry. Additionally, the flexibility of these tracks allows students to change the focus of their degree program during their undergraduate experience.</p> <p>The curriculum leading to the BA degree 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. The BA degree in chemistry also provides excellent preparation for entrance into a variety of professional schools, including dental, veterinary, 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. This degree may also be of interest to students who have completed a significant number of credits in another degree program and decide they want to earn a degree in chemistry. The BA degree program in chemistry can incorporate a complementary program in almost any other field in the university; some disciplines that 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.</p> <p>The curriculum leading to the BSEd degree in chemistry is designed to prepare the student to teach chemistry at the secondary school level. Upon completion of the specified course work and the requirements of the teacher certification process, the student is eligible for Pennsylvania certification by the Pennsylvania Department of Education.</p>
	<p>Bachelor of Science – Chemistry/Pre-Medical Track</p>	<p>Bachelor of Science – Chemistry/Pre-Medical Track</p>

(F) C u r r e n t P r o g r a m R e q u i r e m e n t s	Liberal Studies: As outlined in the Liberal Studies section with the following specifications: Mathematics: MATH 125 Natural Sciences: PHYS 111-121 and 112-122 or 131-141 and 132-142 Philosophy or Religious Studies: PHIL 222 Social Science: PSYC 101, SOC 151 Liberal Studies Elective: 3cr, MATH 126, no courses with CHEM prefix	44	R e q u i r e m e n t s (i f c h a n g i n g , p l e a s e h i g h l i g h t i n R E D w h a t i s b e i n g c h a n g e d)	Liberal Studies: As outlined in the Liberal Studies section with the following specifications: Mathematics: MATH 125 (1) Natural Sciences: PHYS 111-121 and 112-122, or 131-141 and 132-142 Philosophy/Religious Studies: PHIL 122 Social Science: PSYC 101, SOC 151 or ANTH 110 or ANTH 211 (2,3) Liberal Studies Elective: 3cr, MATH 126 (1), no course with CHEM prefix	44
	Major: Required Courses:	4 6 - 47		Major: Required Courses:	49
	CHEM 111 General Chemistry I or CHEM 113 Advanced General Chemistry I	4 cr		CHEM 111 General Chemistry I or CHEM 113 Advanced General Chemistry I	4 cr
	CHEM 112 General Chemistry II or CHEM 114 Advanced General Chemistry II	4 cr		CHEM 112 General Chemistry II or CHEM 114 Advanced General Chemistry II	4 cr
	CHEM 214 Intermediate Inorganic Chemistry (3)	3 cr		CHEM 214 Intermediate Inorganic Chemistry (3)	3 cr
	CHEM 231 Organic Chemistry I	4 cr		CHEM 231 Organic Chemistry I	4 cr
	CHEM 232 Organic Chemistry II	4 cr		CHEM 232 Organic Chemistry II	4 cr
	CHEM 290 Chemistry Seminar I	1 cr		CHEM 290 Chemistry Seminar I	1 cr
	CHEM 325 Analytical Chemistry I	4 cr		CHEM 325 Analytical Chemistry I (3)	4 cr
	CHEM 341 Physical Chemistry I	4 cr		CHEM 341 Physical Chemistry I (3)	4 cr
	CHEM 390 Chemistry Seminar II	1 cr		CHEM 390 Chemistry Seminar II	1 cr
	CHEM 490 Chemistry Seminar III	1 cr		CHEM 490 Chemistry Seminar III	1 cr
	CHEM 498 Problems in Chemistry	2 cr		CHEM 498 Problems in Chemistry	2 cr
BIOC 301 Foundations of Biochemistry	3 cr	BIOC 301 Foundations of Biochemistry	3 cr		
BIOC 302 Advanced Biochemistry	3 cr	BIOC 302 Advanced Biochemistry	3 cr		
Controlled Electives:		Controlled Electives:			

CHE M 343	Physical Chemistry Laboratory I	1 cr
CHE M 390	Chemistry Seminar II	1 cr
CHE M 490	Chemistry Seminar III	1 cr
CHE M 498	Problems in Chemistry	2 cr
BIO C 301	Foundations of Biochemistry	3 cr
BIO C 302	Advanced Biochemistry	3 cr
Controlled Electives:		
Two of the following: CHEM 326, 342 and 344, or 411		7 c r- 8 cr
Other Requirements:		1 9 - 20
MA TH 216	Probability and Statistics for Sciences	3 cr
MA TH 225	Calculus III for Physics, Chemistry, and Mathematics	3 cr
BIO L 202	Principles of Cell and Molecular Biology	4 cr
BIO L 241	Introductory Medical Microbiology	4 cr
At least 6cr from the following list: BIOL 150, 240, 263, 363, 364		6 c r- 7 cr

At least 11cr additional from the following list: (2, 3, 4)		1 1 cr
BIOC: 311, 312, 481		
BIOL: 150, 240, 241, 250, 331		
CHEM: 326, 331, 342, 343, 344, 411, 481		
MATH: 225		
Other Requirements:		11
BIOL 202	Principles of Cell and Molecular Biology	4 cr
BIOL 203	Principles of Genetics and Development	4 cr
MATH 216	Probability and Statistics for Natural Sciences	3 cr
Free Electives: (2,3)		1 6
Total Degree Requirements:		1 20

(1) For students transferring into the program, MATH 121 and 122 may be substituted for MATH 125 and 126, respectively.

(2) The application requirements of specific Schools of Medicine may result in the need to take additional courses. Students should be aware of the requirements at each program in which they are interested, and plan to take courses accordingly to meet these requirements.

(3) Students enrolled at an accredited School of Medicine after three years at IUP may count the following toward the requirements for the Bachelor of Science – Chemistry/Pre-Medical Track: 3cr of LS social science; 11cr of required CHEM courses (see below); 13cr of free electives (total 27cr). Upon completing the first year of Medical School, students electing this option are not required to take CHEM 214, 325 and 341. If these CHEM courses are taken, they may be counted toward the controlled elective requirement.

(4) To qualify for an ACS-certified degree in chemistry, students must take BIOC 311, CHEM 343, and two courses from the following list: BIOC 481, CHEM 326, 331, 342, 411 or 481.

Free Electives:	9 - 11
Total Degree Requirements:	1 20

(G) Supporting Documents*	<p>Are you making a major change?</p> <p>YES</p> <p>If making a major change, please attach a document with a summary of any/all changes.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="text-decoration: underline;">File</th> <th style="text-decoration: underline;">Modified</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	File	Modified		
File	Modified				

Liberal Studies Section

- Complete this section only for a new Liberal Studies course or Liberal Studies course revision

<p>If Completing this Section,</p> <p>Check the Box to the Right:</p>	<input type="checkbox"/>
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Liberal Studies Course Designations (Check all that apply)	
Learning Skills:	
Knowledge Area:	
Liberal Studies Elective	<i>Please mark the designation(s) that apply - must meet at least one</i>
Expected Undergraduate Student Learning Outcomes (EUSLOs)	<p><i>Describe how each Student Learning Outcome in the course enables students to become Informed Learners, Empowered Learners and/or Responsible Learners</i></p> <p><i>See http://www.iup.edu/WorkArea/DownloadAsset.aspx?id=181694</i></p>
Description of the Required Content for this Category	<i>Narrative on how the course will address the Selected Category Content</i>

All Liberal Studies courses are required to include perspectives on cultures and have a supplemental reading.

Please answer the following questions.

<p>Liberal Studies courses must include</p> <p>the perspectives and contributions</p> <p>of ethnic and racial minorities and</p> <p>of women whenever appropriate to</p> <p>the subject matter. Please explain</p> <p>how this course will meet this</p> <p>criterion.</p>	
<p>Liberal Studies courses require the</p> <p>reading and use by students of at</p> <p>least one non-textbook work of</p> <p>fiction or non-fiction or a collection</p> <p>of related articles. Please describe</p> <p>how your course will meet this</p> <p>criterion.</p>	

Teacher Education Section

- Complete this section only for a new Teacher Education course or Teacher Education course revision

<p>If Completing this Section,</p> <p>Check the Box to the Right:</p>	
<p>Course Designations:</p>	
<p>Key Assessments</p>	
	<p>For both new and revised courses, please attach (see the program education coordinator):</p> <ul style="list-style-type: none"> • The Overall Program Assessment Matrix • The Key Assessment Guidelines • The Key Assessment Rubric <p style="text-align: center;">File Modified</p> <hr/> <p>No files shared here yet.</p> <ul style="list-style-type: none"> • Drag and drop to upload or browse for files 
<p>Narrative Description of the Required Content</p>	<p><i>How the proposal relates to the Education Major</i></p>

For Deans Review

Are Resources Available/Sufficient for this Course?

Is the Proposal Congruent with the College Mission?

Has the Proposer Attempted to Resolve Potential Conflicts with Other Academic Units?

Comments:

Please scroll to the top and click the Page Status if you are ready to take action on the workflow.
Please submit an ihelp if you have any questions <http://ihelp.iup.edu>