# 14-1816. UWUCC AP-4/21/15 Senate App 9/8/15

### **New Course Proposal Template**

#### Steps to the approval process:

- 1. Complete the applicable template(s) and email them to the departmental or program curriculum committee chair.
- 2. The curriculum chair emails the proposal to the curriculum committee, then to the department/program faculty for a vote and finally to the department/program chair.
- 3. The department/program chair emails the proposal to <a href="mailto:curriculum-approval@iup.edu">curriculum-approval@iup.edu</a>; this email will also serve as an electronic signature.
- 4. Curriculum committee staff will log the proposal, forward it to the appropriate dean's office(s) for review within 14 days and post it on the X Drive for review by all IUP faculty and administrators. Following the dean's review the proposal goes to the UWUCC/UWGC and the Senate.
- 5. Questions? Email curriculum-approval@iup.edu.

Contact	Charles Lake	Email	lake@iup.edu
Person:		Address:	
Proposing	Chemistry	Phone:	72398
Depart/Unit:			

Prefix/Number	CHEM 461/561				
Course Title	Modern Diffraction				
Dual/Cross Listed	Dual Listed = Courses listed at two levels, such as undergraduate and graduate, masters and doctoral, etc. Cross Listed = Course has more than one prefix such as GEOG/RGPL 233.  X Yes No  If yes with: Undergraduate and graduate level.				
Number of Credits	(UG) Class Hours - 3 (UG) Lab Hours - 0 Credits - 3cr				
Prerequisite(s)	CHEM 112 or 114 and PHYS 112 or 132				
Corequisite(s)	This means that another course must be taken in the same semester as the proposed course Click here to enter text.				
Additional Information (Check all that apply. Note: Additional documentation will be required)	<ul> <li>☐ Liberal Studies (please also complete Template C)</li> <li>☐ Teacher Education (Is it Step 1 a prerequisite or is it part of the Professional Education Sequence If so please also complete Template D)</li> <li>☐ Distance Education (Please also complete Template E)</li> </ul>				
	Are you recommending a class size: ☐ Yes ☐ No Number: Click here to enter text.				
Recommended Class Size (optional) (provide justification)	If yes: (check one of the following reasons and provide a narrative explanation)  Pedagogical Physical limitation of classroom  Accreditation body standards/recommendations  Other  Explanation (required): Click here to enter text.				
Catalog Description	Guidelines: Do not include pre/co-requisite information here. The registrar prefers a concise description of course content, beginning with an active verb.				

## Template A

	Investigates advances in crystallography and its applications to modern science. Emphasizes powder diffraction, including Rietveld analysis. Develops proficiency in data collection, phase analysis and structure refinement and shows how crystallographic science can address scientific problems.						
Student Learning Outcomes  (These should be measurable, appropriate to the course level, and phrased in terms of student achievement, not instructional or content outcomes)  If dual listed, indicate additional learning objectives for the higher level course.	The Student will be able to:  1. Demonstrate basic proficiency in crystallography 2. Demonstrate proficiency in X-ray data collection 3. Elucidate, refine and evaluate crystal structure from X-ray diffractograms 4. Interpret crystal structures and use the information to solve scientific problems 5. Give and defend a scientific poster presentation on any related topic.  The graduate student will be able to: 1. Fulfill the objectives above, but demonstrate a deeper level of analysis and understanding of chemical and physical processes/structure in their work 2. Read and critique related scientific literature 3. Give and defend a 20 minute oral presentation on any current topic related to Modern Diffraction, applying course material.						
Brief Course Outline: Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar, or assignments.	<ul> <li>(a) Introduction, Radiation Safety, Point Symmetry</li> <li>(b) Lattices, Space Groups, Interpreting International Tables for Crystallography</li> <li>(c) Formalization of Symmetry</li> <li>(d) Radiation Production, Fundamentals of Diffraction,</li> <li>(e) Scattering Factors, Structure Factors and Systematic Absences.</li> <li>(f) Structure Elucidation</li> <li>(g) Single Crystal Crystallography, Introduction to SHELX Program Package</li> <li>(h) Powder Diffractometry, Introduction to GSAS Program Package</li> <li>(i) Powder Diffraction Indexing and Phase Analysis,</li> <li>(j) Introduction to Jade Software, Crystallographic Data Bases, Rietveld Analysis,</li> <li>(k) Structure Solution from Powders, Introduction to EXPO2009 Software</li> <li>(l) Crystal Structure Interpretation and Results</li> <li>(m) Solving scientific problems with crystallographic results</li> </ul>						
Rationale for Proposal							
Why is this course being proposed?	This course will enter the rotation list fo	or electives in the Professional Scien	nce Masters-Chemistry.				
How does it fit into the departmental curriculum? (Check all that apply)	☐ Major Requirement ☐  ☐ Required Elective ☐  ☐ Other - Click here to enter text	Minor Requirement  Liberal Studies	☐ Core Requirement (Interdisciplinary core – e.g Business/Education) ☐ Open Elective				
Is a similar class offered in other departments?	☐ Yes Please provide comment: Click here to enter text.  ☒ No						
Does it serve the college/university	⊠ Yes						

## Template A

Source Designed for Majors (   Required   Not Required   Not Required   Departmental Elective	above and beyond the role it serves in the department?	Please provide comment: Course could be used in Professional Science Masters - PHYS  No					
Who is the target audience for the course?  Restricted to Majors/Minors		⊠ Course Designed for Majors ( □ Required					
audience for the course?    Restricted to Majors/Minors   Open to Any Student	Who is the target	☐ Course Designed for Minor		□ Departmental	Elective		
Other - Click here to enter text.	audience for the	☐ Restricted to Majors/Minors	Majors/Minors □ Open to Any Student		Student		
A. What are the implications for other departments (For example: overlap of content with other disciplines, requirements for other programs)?  Course could be used as an elective in Professional Science Masters-PHYS  B. How have you addressed this with other department(s) involved? What was the outcome of that attempt? (Attach documents as appropriate)  Department has been notified.  Are the resources adequate (i.e. faculty, space, equipment, laboratory supplies, library materials, travel funds, etc.)?  For Dean's Review  • Are resources available/sufficient for this course?		☐ Liberal Studies					
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adequate (i.e. faculty, space, equipment, laboratory supplies, library materials, travel funds, etc.)?    For Dean's Review		disciplines. requirements for other programs)?  Course could be used as an elective in Professional Science Masters-PHYS  B. How have you addressed this with other department(s) involved? What was the outcome of that attempt? (Attach documents as appropriate)					
laboratory supplies, library materials, travel funds, etc.)?  For Dean's Review  Are resources available/sufficient for this course?	adequate (i.e. faculty,	⊠ Yes					
travel funds, etc.)?  For Dean's Review  • Are resources available/sufficient for this course? ☐ Yes ☐ No ☐ NA  • Is the proposal congruent with college mission? ☐ Yes ☐ No ☐ NA  • Has the proposer attempted to resolve potential conflicts with other academic units? ☐ Yes ☐ No ☐ NA	laboratory supplies,						
<ul> <li>Are resources available/sufficient for this course? ☐ Yes ☐ No ☐ NA</li> <li>Is the proposal congruent with college mission? ☐ Yes ☐ No ☐ NA</li> <li>Has the proposer attempted to resolve potential conflicts with other academic units? ☐ Yes ☐ No ☐ NA</li> </ul>							
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$\square$ NA	• Is the proposal congruent with college mission? $\square$ Yes $\square$ No $\square$ NA						
Comments: Click here to enter text.							
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