COSC 319 Software Engineering Concepts-CrsRvs-2018-09-14

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

Form Information

The page you originally access is the global template version. To access the template document that progresses through the workflow, please complete the following steps:

First Step: <u>ONLY</u> change the text in the [brackets] so it looks like this: **CRIM 101 Intro to Criminology-CrsRvs-2015-08-10**

- *If DUAL LISTED list BOTH courses in the page title*

Second Step: Click **"SAVE"** on bottom right

- *DO NOT TYPE ANYTHING INTO THE FIRST PAGE OTHER THAN THE TEXT IN BRACKETS*
- *Please be sure to remove the Brackets while renaming the page*

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

Fourth Step: Click on "**EDIT CONTENTS** "(*not EDIT*) and start completing the template. When exiting or when done, click **"SAVE"** (*not Save Draft*) 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.

*Indicates a required field

Proposer*	Terrence Fries	Proposer Email*	tfries@iup.edu
Contact Person*	Terrence Fries	Contact Email*	tfries@iup.edu
Proposing Department/Unit*	Mathematical and Computer Sciences	Contact Phone*	7-4492

Course Level*	undergraduate-level

Course Revisions
(Check all that apply;fill out categories below as specified; i.e. if only changing a course title, only complete Category A)

Category A:	Category B:

catalog_desc_change
mod_prereq
	course_revision
	liberal-studies
	
	*Teacher Education: Please complete the Teacher
	   Education section of this form (below)*
	*Liberal Studies: Please complete the Liberal Studies
	   section of this form (below)*
	*Distance Education: Please complete the Distance
	   Education section of this form (below)*

Rationale for Proposed Changes (All Categories)

(A) Why is the course being revised/deleted:* *Please be specific - this should be have more detail than the Summary for the Senate.*	This course is being revised to reflect changes in software engineering techniques and methodologies currently used in industry. The addition of "C or better" to the prerequisite is done because students must have a thorough understanding of programming concepts to succeed in this course.
(B) University Senate Summary of Rationale*	*Please enter a single paragraph summary/rationale of changes or proposal for University Senate.* This course is being revised to reflect changes in software engineering techniques and methodologies currently used in industry. The addition of "C or better" to the prerequisite is done because students must have a thorough understanding of programming concepts to succeed in this course.
(C) Implications of the change on the program, other programs and the Students:*	There will be no impact on the program or students other than to better prepare them for jobs.

Current Course Information*	
Category A	
(D) Current Prefix*	COSC
Proposed Prefix	
(E) Current Number*	319
Proposed Number	
(F) Current Course Title*	Software Engineering Concepts
Proposed Course Title	
(G) Prerequisite(s)	COSC 310 or instructor permission
Proposed Prerequisite(s)	Grade of "C" or better in COSC 310
(H) Current Catalog Description	Software engineering concepts include the collection of tools, procedures, methodologies, and accumulated knowledge about the development and maintenance of software-based systems. Strongly suggested for any student planning to take an internship in Computer Science. After an overview of the phases of the software lifecycle, current methodologies, tools, and techniques being applied to each phase will be discussed in depth with localized exercises given to reinforce learning of concepts.
Proposed Catalog Description	Introduces classical software engineering life cycle models and modern agile methodologies. Includes requirements elicitation, specification, design, and testing. Covers metrics, risk mitigation, and other tools required for software development. Students will participate on a team to develop a large-scale software product using an appropriate software engineering methodology.

	If changing Category A, no further action required.

Category B (if no change, leave blank)

(I) Repeatable Course This is for a course that can be repeated Multiple times e.g. Internship	If YES, please complete the following: Number of Credits that May be Repeated: Maximum Number of Credits Allowed to be Repeated:
Proposed Repeatable Course	If YES, please complete the following: Number of Credits that May be Repeated: Maximum Number of Credits Allowed to be Repeated:
(J) Number of Credits	Class Hours per week:3 Lab Hours:0 Credits:3
Proposed Number of Credits	Class Hours:Lab Hours:Credits:
(K) Current Course Student **Learning Outcomes (SLOs)**	Upon successful completion of this course, the students will be able to: 1. Define the current state of software development and maintenance characterized as "the software crisis." 2. Understand the multidimensional aspect of software engineering, which is the current best attempt at solving the software crisis. 3. Become familiar with popular models of the software development and maintenance process. 4. Using the waterfall model, study the inputs, outputs, and processes present in each phase. 5. Study the core concepts present in several popular methodologies and be able to identify strengths and weaknesses of each. 6. Study existing CASE tools to be able to identify opportunities to automate tasks through the use of such tools. 7. Consider the issues and techniques present in confidence gaining measures residing in each phase of the software lifecycle. 8. Briefly investigate problems present in project management.

(L) Proposed Course Student

Learning Outcomes (SLOs)

For each outcome, describe how

the outcome will be achieved

Note that the text box in the table expands

SLO #	Outcome	How outcome is assessed
1	Compare and contrast classical software life cycle models and modern agile methodologies.	Exam questions, written assignments
2	Apply metrics to determine the size of a proposed software product.	Exam questions, written assignments, team project
3	Apply accepted methods of risk mitigation and software testing.	Exam questions, written assignments
4	Analyze appropriate software architectures in a high-level system design.	Exam questions, written assignments, team project
5	Develop a non-trivial software product as part of a team using an appropriate software engineering methodology.	Team project
6	Communicate in writing and orally technical material regarding software engineering.	Written assignments, team project, oral presentation

(M) Previous Brief Course Outline *(It is acceptable to copy* *from old syllabus)*	*As outlined by the federal definition of a "credit hour", the following should be a consideration* *regarding student work - For every one hour of classroom or direct faculty instruction,* *there should be a minimum of two hours of out of class student work.* A. Course Introduction and Administration 0.5 hrs. B. The Software Crisis and Software Engineering 3.0 hrs. C. The Software Life Cycle - A Model of Software Development 1.5 hrs. D. Requirements Analysis 1.5 hrs. E. Design Issues 3.0 hrs. F. Design Methodologies 6.0 hrs. G. Implementation Techniques 3.0 hrs. H. Development Tools 3.0 hrs. I. Software Quality 6.0 hrs. J. Generic Code and Automatic Code Generation 6.0 hrs. K. Programming Environments 3.0 hrs. L. Management of Software Development 3.0 hrs. M. Maintenance 3.0 hrs. Exams (2) 2.0 hrs.

(N) Brief Course Outline
 	
(Give sufficient detail to communicate the content to faculty across campus.
 	
It is not necessary to include specific readings, calendar or assignments)
	As outlined by the federal definition of a "credit hour", the following should be a consideration
	
	regarding student work - For every one hour of classroom or direct faculty instruction,
	
	there should be a minimum of two hours of out of class student work.
	
	A. Introduction
	
	    1. Software crisis
	
	    2. What is software engineering?
	
	B. Software Life-Cycle Models
	
	    1. Waterfall model
	
	    2. Other classical methods
	
	    3. Unified Process
	
	    4. Agile
	
	C. Teams
	
	D. Planning and Estimating
	
	    1. Metrics
	
	    2. Project plans
	
	E. Requirements Elicitation
	
	F. Analysis
	
	    1. Classical Analysis
	
	        a. Structured programming
	
	        b. Data flow diagrams
	
	    2. Object-Oriented Analysis
	
	        a. UML Classes
	
	        b. UML Relationships
	
	        c. UML Sequence Diagrams
	
	G. Implementation and Testing
	
	H. Agile Variations
	
	    1. Scrum
	
	    2. Feature-Driven Development (FDD)
	
	    3. Dynamic Systems Development Method (DSDM)
	
	    4. Additional agile methods
	
	I. Team Project

Distance Education Section

- Complete this section only if adding Distance Education to a New or Existing Course

If Completing this Section, Check the Box to the Right:	**NOTE: you must check this box if the Course has previously been approved for Distance Education**
Course Prefix/Number	
Course Title	
Type of Proposal	*See CBA, Art. 42.D.1 for Definition*

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 assignment*s
	As outlined by the federal definition of a "credit hour", the following should be a consideration regarding student work - For every one hour of classroom or
	direct faculty instruction, there should be a minimum of two hours of out of class student work.

Rationale for Proposal (Required Questions from CBA)	
How is/are the instructor(s) qualified **in the Distance Education delivery** **method as well as the discipline?**	
For each outcome in the course, describe **how the outcome will be achieved using** **Distance Education technologies.**	
How will the instructor-student and **student-student interaction take place?** **(if applicable)**	
How will student achievement be evaluated?	
How will academic honesty for tests **and assignments be addressed?**	

Liberal Studies Section

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

If Completing this Section, **Check the Box to the Right:**	**NOTE: you must check this box if the Course/Program has previously been approved for Liberal Studies** liberal-studies

Liberal Studies Course Designations (Check all that apply)	
Learning Skills:	
Knowledge Area:	

Liberal Studies Elective	*Please mark the designation(s) that apply - must meet at least one*	
Expected Undergraduate Student Learning Outcomes (EUSLOs) Map the Course Outcome to the **EUSLO's**	*Map each course outcome to the appropriate EUSLOs tha apply. Fill in the course outcome number* *See https://www.iup.edu/liberal/faculty-and-staff/euslos/ for additional information regarding mapping EUSLOs*	
	Informed Learners demonstrate:	**Course SLO #**
	• the ways of modeling the natural, social and technical worlds	
	• The aesthetic facets of human experience	
	• the past and present from historical, philosophical and social perspectives	
	• the human imagination, expression and traditions of many cultures	
	• the interrelationships within and across cultures & global communiites	
	• the interrelationships within and across disciplines	
	Empowered Learners demonstrate:	**Course SLO #**
	• effective oral and written communication abilities	
	• ease with textual, visual and electronically-mediated literacies	
	• problem solving skills using a variety of methods and tools	
	• information literacy skills including the ablity to access, evaluate, interpret and use informatoin from a variety of sources	
	• the ablity to transform information into knowledge and knowledge into judgement and action	
	• the ability to work within complex systems and with diverse groups	
	• critical thinking skills including analysis, application and evaluation	
	• reflective thinking and the ability to synthesize information and ideas	
	Responsible Learners demonstrate:	**Course SLO #**
	• intellectual honesty	
	• concern for social justice	

	• civic engagement
	• an understanding of the ethical and behavioral consequences of decisions and actions on themselves, on society, and on the physical world
	• an understanding of themselves and a respect for the identities, histories and cultures of others

How will each outcome be measured (note should mirror (L) Student Learning Outcomes* (SLO) from the course proposal	*Narrative on how the course will address the Selected Category Content*
	Course SLO #	**Assessment Tool to be used to measure the outcome**
	1	
	2	
	3	

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

Please answer the following questions.

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

Teacher Education Section

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

If Completing this Section, Check the Box to the Right:	**NOTE: you must check this box if the Course/Program has previously been approved for Teacher Education related items**
Course Designations:	
Key Assessments	

	For both new and revised courses, please attach (see the program education coordinator):
	- The Overall Program Assessment Matrix - The Key Assessment Guidelines - The Key Assessment Rubric **File** **Modified** No files shared here yet. • Drag and drop to upload or browse for files
Narrative Description of the **Required Content**	*How the proposal relates to the Education Major*

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