Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

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Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or 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

Current course prefix, number and full title: _____

Proposed course prefix, number and full title, if changing: _____

2. Liberal Studies Course Designations, as appropriate
This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

☐ Learning Skills ☐ Knowledge Area ☐ Global and Multicultural Awareness ☐ Writing Across the Curriculum (W Course)

☐ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

☐ Global Citizenship ☐ Information Literacy ☐ Oral Communication

☐ Quantitative Reasoning ☐ Scientific Literacy ☐ Technological Literacy

3. Other Designations, as appropriate

☐ Honors College Course ☐ Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

☐ Catalog Description Change ☑ Program Revision ☐ Program Title Change ☐ New Track

☐ New Degree Program ☐ New Minor Program ☐ Liberal Studies Requirement Changes ☐ Other

Current program name: Bachelor of Science - Computer Science / Information Assurance Track

Proposed program name, if changing: _____

5. Approvals

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	T— B F	2/6/12
Department Chairperson(s)	Wm. Oghta	2/10/2012
College Curriculum Committee Chair	Anne Kondo	3/7/12
College Dean	Dean Smf	3/12/12
Director of Liberal Studies (as needed)	P. l H Ruth	3/22/12
Director of Honors College (as needed)		
Provost (as needed)	Michael V. Fleman	3/27/12
Additional signature (with title) as appropriate		
UWUCC Co-Chairs	Gail S Sechrist	4/3/12

Part II. Description of Curriculum Change

1. Catalog Description for the Revised Bachelor of Science- Computer Science/Information Assurance Track

Note: Retain COSC preamble in catalog as it currently appears.

Bachelor of Science- Computer Science/
Information Assurance Track

Liberal Studies:	43-44
As outlined in Liberal Studies section	
with the following specifications:	
Social Science: CRIM 101 (1)	
Mathematics: 3cr, MATH 125(2)	
Liberal Studies Electives: 3cr, MATH 216	

Major:

Required Courses: 49

COSC 105	Fundamentals of Computer Science	3cr
COSC 110	Problem Solving and Structured Programming	3cr
COSC 210	Object-Oriented and GUI Programming	3cr
COSC 220	Applied Computer Programming	4cr
COSC 300	Computer Organization and Assembly Language	3cr
COSC 310	Data Structures and Algorithms	3cr
COSC 319	Software Engineering Concepts	3cr
COSC 341	Database Management	3cr
COSC 380	Seminar in Computing Profession and Ethics	2cr
COSC 480	Seminar on Technical Topics	1cr

Information Assurance Required Courses:

COSC 316	Host Computer Security (3,4,5)	3cr
COSC 345	Computer Networks	3cr
COSC 356	Network Security (3,4,5)	3cr
Select one of the following:		
COSC 473	Software Engineering Practice or	3cr
	COSC 493 Internship in Computer Science (6)	

Controlled Electives: 6cr from the following: (7)

COSC/IFMG 354	Testing and Controlling LANs	3cr
COSC 362	Unix Systems	3cr
COSC 365	Web Architecture and Application Development	3cr
COSC 481	Special Topics in Computer Science (as approved for majors in this track)	3cr
IFMG 382	Auditing for EDP Systems	3cr

Upper-Level Electives: 3cr from the following:

COSC 432	Operating Systems	3cr
COSC 427	Introduction to Cryptography	3cr
COSC 429	Digital Forensics	3cr
COSC 454	Information Assurance Administration (5)	3cr
COSC 465	Distributed Processing and Web Services	3cr
COSC 482	Independent Study	3cr
COSC 400-level course with department approval		3cr

Minor in Criminology (1)	15
Other Requirements:	6
Additional Writing:	
ENGL 222 Technical Writing	3cr
Additional Mathematics:	3cr
MATH 219 Discrete Mathematics	

Free Electives: 6-7

Total Degree Requirements: 120

(1)   CRIM 101 (taken as part of the social science requirement) is counted as part of the 18cr Criminology minor. Fifteen (15) additional credits of CRIM are required.
(2)   MATH 125 can be substituted by MATH 121.
(3)   A CNSS 4011 certificate will be granted on completion of COSC 316, COSC 356, CRIM 321, and CRIM 323.
(4)   A CNSS 4012 certificate will be granted on completion of COSC 316, COSC 356, COSC 454, CRIM 321, and CRIM 323.
(5)   A CNSS 4013 certificate will be granted on completion of COSC 220, COSC 316, COSC 356, CRIM 321, and CRIM 323.
(6)   COSC 493 may be selected after completion of sophomore year. Note: Only 3cr of first 6cr of COSC 493 can be counted toward controlled electives or 6cr of a total 12cr of COSC 493 can be counted towards major. A student who does not complete all 12cr of COSC 493 must take COSC 473.
(7)   Upper-level electives may be counted as controlled electives. 3cr of Intermediate Level foreign language may be applied toward controlled electives.

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2. Summary of Changes

a) Side-by-side comparison of Current and Proposed programs (the changes are shown in italics).

Current Program

Bachelor of Science- Computer Science/
Information Assurance Track

Liberal Studies:	*48*
As outlined in Liberal Studies section	
with the following specifications:	
Social Science: CRIM 101 (1)	
Mathematics: 3cr, MATH 125(2)	
Liberal Studies Electives: *3cr*, MATH 216	

Major:	
Required Courses:	**43**
COSC 105 Fundamentals of Computer Science	3cr
COSC 110 Problem Solving and Structured Programming	3cr
COSC 210 Object-Oriented and GUI Programming	3cr
COSC 220 Applied Computer Programming	4cr
COSC 300 Computer Organization and Assembly Language	3cr
COSC 310 Data Structures and Algorithms	3cr
COSC 319 Software Engineering Concepts	3cr
COSC 341 Database Management	3cr
COSC 380 Seminar in Computing Profession and Ethics	2cr
COSC 480 Seminar on Technical Topics	1cr
Information Assurance Required Courses:	
COSC 316 Host Computer Security	3cr
COSC 356 Network Security	3cr
Select one of the following:	
COSC ~~320~~ Software Engineering Practice	3cr
COSC 493 Internship (Information Assurance)	~~12cr~~ (3)

Controlled Electives: ~~3cr~~ from the following:

~~COSC 345 Computer Networks~~	~~3cr~~
COSC/IFMG 354 Testing and Controlling LANs	3cr
COSC 362 Unix Systems	3cr
COSC 365 Web Architecture and Application Development	3cr
COSC 481 Special Topics in Computer Science (as approved for majors in this track)	3cr
IFMG 382 Auditing for EDP Systems	3cr
Upper-Level Electives: 3cr from the following:	
COSC 432 Operating Systems	3cr
COSC 427 Introduction to Cryptography	3cr
COSC 482 Independent Study	3cr
COSC 400-level course with department approval	3cr

A minor in Criminology	**15 (1)**

Other Requirements:	**6-12**
Additional Writing:	
ENGL ~~322~~ Technical Writing	3cr
~~Foreign Language Intermediate Level~~	~~0-6cr~~
Additional Mathematics:	3cr (2)
MATH 219 Discrete Mathematics	

Proposed Program

Bachelor of Science- Computer Science/
Information Assurance Track

Liberal Studies:	*43-44*
As outlined in Liberal Studies section	
with the following specifications:	
Social Science: CRIM 101 (1)	
Mathematics: 3cr, MATH 125(2)	
Liberal Studies Electives: *3cr*, MATH 216	

Major:	
Required Courses:	**49**
COSC 105 Fundamentals of Computer Science	3cr
COSC 110 Problem Solving and Structured Programming	3cr
COSC 210 Object-Oriented and GUI Programming	3cr
COSC 220 Applied Computer Programming	4cr
COSC 300 Computer Organization and Assembly Language	3cr
COSC 310 Data Structures and Algorithms	3cr
COSC 319 Software Engineering Concepts	3cr
COSC 341 Database Management	3cr
COSC 380 Seminar in Computing Profession and Ethics	2cr
COSC 480 Seminar on Technical Topics	1cr
Information Assurance Required Courses:	
COSC 316 Host Computer Security (3,4,5)	3cr
COSC 345 Computer Networks	*3cr*
COSC 356 Network Security (3,4,5)	3cr
Select one of the following:	
COSC 473 Software Engineering Practice or COSC 493 Internship in Computer Science (6)	3cr

Controlled Electives: *6cr* from the following: *(7)*

COSC/IFMG 354 Testing and Controlling LANs	3cr
COSC 362 Unix Systems	3cr
COSC 365 Web Architecture and Application Development	3cr
IFMG 382 Auditing for EDP Systems	3cr
Upper-Level Electives: 3cr from the following:	
COSC 432 Operating Systems	3cr
COSC 427 Introduction to Cryptography	3cr
COSC 429 Digital Forensics	*3cr*
COSC 454 Information Assurance Administration (5)	*3cr*
COSC 465 Distributed Processing and Web Services	*3cr*
COSC 482 Independent Study	3cr
COSC 400-level course with department approval	3cr

A minor in Criminology (1)	**15**

Other Requirements:	**6**
Additional Writing:	
ENGL *222* Technical Writing	3cr
Additional Mathematics:	3cr (2)
MATH 219 Discrete Mathematics	

Proposed Program

Free Electives: ~~2~~ 8

Total Degree Requirements: 120

   (1) CRIM 101 (taken as part of the social science requirement) is counted as part of the 18cr Criminology minor. Fifteen (15) additional credits of CRIM are required.

   (2) MATH 125 can be substituted by MATH 121.

   (3) COSC 493 may be selected ~~in either the second semester of the junior year or the first semester of the senior year. If COSC 493 is selected and approved, COSC 380 may be taken in the immediately preceding semester.~~ Note: Only 4 ~~cr~~ of COSC 493 may be counted towards the major.

Free Electives: *6-7*

Total Degree Requirements: 120

   (1) CRIM 101 (taken as part of the social science requirement) is counted as part of the 18cr Criminology minor. Fifteen (15) additional credits of CRIM are required.

   (2) MATH 125 can be substituted by MATH 121.

   (3) A CNSS 4011 certificate will be granted on completion of COSC 316, COSC 356, CRIM 321, and CRIM 323.

   (4) A CNSS 4012 certificate will be granted on completion of COSC 316, COSC 356, COSC 454, CRIM 321, CRIM and 323.

   (5) A CNSS 4013 certificate will be granted on completion of COSC 220, COSC 316, COSC 356, CRIM 321, and CRIM 323.

   (6) COSC 493 may be selected after completion of sophomore year. Note: Only 3cr of first 6cr of COSC 493 can be counted toward controlled electives or 6cr of a total 12cr of COSC 493 can be counted towards major. A student who does not complete all 12cr of COSC 493 must take COSC 473.

   (7) Upper-level electives may be counted as controlled electives. 3cr of Intermediate Level foreign language may be applied toward controlled electives.

b) List of associated course changes

The following courses have changed course numbers:

**COSC 320 Software Engineering Practice, re-numbered
as COSC 473 Software Engineering Practice**

The following courses have been revised:

**COSC 473 Software Engineering Practice
COSC 493 Internship in Computer Science**

The following courses have been added:

**COSC 429 Digital Forensics
COSC 454 Information Assurance Administration
COSC 465 Distributed Processing and Web Services**

3. Rationale

This program revision represents a few changes based on recommendations from the Computer Science Corporate Advisory board together with minor curriculum changes to replace an outdated course with an alternative, and renumber a course to better align with level and purpose. Specifics are:

a) COSC 320 Software Engineering Practice is the practicum that is intended to be a capstone of the Computer Science program where student apply their skills and knowledge to sizable projects that are representative to industry. It is the on-campus counterpart to an internship experience. Given this, it is being renumbered to 473 to indicate a senior level course that is on par with COSC 493 Internship experience. Furthermore, this change provides alignment with the department's ABET accreditation plan in which COSC 493 or COSC 473 are the designated capstone courses.

b) In addition to changing the course number, the course outcomes of COSC 473 have been rewritten to be in line with the COSC 493 and provide better alignment with mappings to program outcomes as required by the ABET accredidation.

c) The number of credits hours of COSC 493 that can be counted toward a major was increased from 2cr per 6cr of 493 to 3cr per 6cr of 493. This change enabled the first 6cr of 493 to be counted as a controlled elective and the last 6cr of 493 to be counted as fulfilling the practicum requirement of the Applied and Information Assurance tracks (or as a second controlled elective in the remaining tracks). In making this change, students may undertake an internship without incurring excessive credits beyond the 120 required for graduation.

d) Since a significant portion of threats are over computer networks, a firm knowledge if computer networking is a required core competency in information assurance. Therefore, COSC 345 Computer Networks is a required course in the information assurance track.

e) Digital forensics is a new area in the domain of information assurance. To address this within the information assurance curriculum course COSC 429 Digital Forensics is proposed. This course is an upper level elective. It may be taken as a controlled elective. The addition of this course will assist in maintaining out accreditation by the National Security Administration.

f) Information assurance administration is a required component to obtain NIST 4012 certification. To address this within the information assurance curriculum course COSC 454 Information Assurance Administration is proposed. This course is an upper level elective. It may be taken as a controlled elective. The addition of this course will assist in maintaining our accreditation by the National Security Administration.

g) COSC 465 Distributed Processing and Web Services is an upper level elective that follows COSC 365 Web Architecture and Application Programming. Distributed Processing and Web Services is an area that is experiencing considerable growth and demand in the industry and is above and beyond the material that can be covered in 365. The topics related to distributed processing and web services can only be covered at a cursory level in 365 due to the volume of content encompassing web technologies. 365 provides minimal discussion of web services and then only in the context of future directions. 465 thus provide a detailed study of web services technologies providing students hand-on labs/exercises/and assignments to use these technologies.

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h) Due to the expansion of the field and the need to cover leading-edge technologies, additional courses in the field are required by many majors. On the advice of the Corporate Advisory Board, the mandate for a foreign language has been removed from the curriculum for pragmatic reasons. In addition, the removal of this mandate provides flexibility for majors to switch tracks with minimal impact. However, the Computer Science department acknowledges the benefits of studying a foreign language and has provided the option to include an intermediate level foreign language course as a controlled elective. The department will continue to encourage the foreign language option when a student's area of concentration permits.

i) ENGL 322 was changed to ENGL 222 as a result of a change in course number initiated by the English department. Course content was not changed.

j) Notes on the CNSS 4011, CNSS 4012, and CNSS 4013 are added to clearly identify the course required in order to be granted a certification.

k) Change the number of credits in COSC electives and the number of free electives. This change was made to accommodate changes in the new Liberal Studies curriculum.

Part III. Implementation

1. Proposed Date of Change.

It is proposed that the changes be implemented for the academic year after the Senate approval.

2. Effects on Currently Enrolled Students.

Students currently enrolled in the program may elect to not complete the foreign language requirement provided they complete the additional Computer Science elective.

3. Effects on Faculty/Resources.

There are no overall effects to the Computer Science faculty. COSC 429, 454, and 465 will be scheduled on a rotating basis with other electives. The frequency that these courses are offered will depend on student demand/interest. Current faculty are prepared to present the content of these courses.

4. Effects on the Number of Students.

It is expected that there will be no significant effects on the number of students in the program. It is anticipated that the requirement of an additional controlled elected to be taken by all students will result in increased enrollment in the controlled and upper level electives, but will not exceed the class capacity. These changes are needed to maintain the department's reputation on preparing students to become software development professionals.

Part IV. Periodic Assessment

The assessment of the success of the proposed changes described in this proposal will be performed as part of the Computer Science Department's overall curriculum assessment policies. This change is minor and will not affect the way current assessment is done.

Part V. Course Proposals

The course proposals for:

COSC 429 Digital Forensics
COSC 454 Information Assurance Administration
COSC 465 Distributed Processing and Web Services

are attached.

Part VI. Letters of Support or Acknowledgement

A request for a letter of support or acknowledgement has been sent to the following departments:

Criminology Department
Foreign Language