

# Cover Sheet: Request 15369

## CSE Major Degree Requirements Update

### Info

Process	Major Curriculum Modify Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Jeremiah Blanchard jblanch@cise.ufl.edu
Created	10/26/2020 2:00:49 PM
Updated	12/7/2020 3:59:59 PM
Description of request	The CISE Department proposes to update the undergraduate CSE major to bring it on par with national standards. Includes changes to critical tracking in addition to curriculum.

### Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Computer and Information Science and Engineering 19140000	Christina Gardner-McCune		10/30/2020
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by the HWCOE Curriculum Committee and Faculty Council	11/17/2020
Summary-CISE-UG-Curr-Changes.docx					
Associate Provost for Undergraduate Affairs	Approved	PV - APUG Review	Casey Griffith		11/18/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			11/18/2020
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
Academic Assessment Committee Notified					
No document changes					
College Notified					
No document changes					

# Major|Modify\_Curriculum for request 15369

## Info

**Request:** CSE Major Degree Requirements Update

**Description of request:** The CISE Department proposes to update the undergraduate CSE major to bring it on par with national standards. Includes changes to critical tracking in addition to curriculum.

**Submitter:** Jeremiah Blanchard jblanch@cise.ufl.edu

**Created:** 12/7/2020 3:45:32 PM

**Form version:** 2

## Responses

### Major Name

*Enter the name of the major. Example: "Mathematical Modeling"*

Response:  
ComputerScience

### Major Code

*Enter the two-letter or three-letter major code.*

Response:  
CSE

### Degree Program Name

*Enter the name of the degree program in which the major is offered.*

Response:  
BachelorofSciencein ComputerScience

### Undergraduate Innovation Academy Program

*Is this an undergraduate program in the Innovation Academy?*

Response:  
No

### Effective Term

*Enter the term (semester and year) that the curriculum change would be effective.*

Response:  
Earliest Available

### Effective Year

Response:  
Earliest Available

## Current Curriculum for Major

Response:

(Also uploaded as separate document with tracked changes)

Mathematics:

MAC 2311

MAC 2312

MAC 2313

MAS 3114

STA 3032

Physical Sciences:

PHY 2048

PHY 2048L

PHY 2049

PHY 2049L

CHM 2045

CHM 2045L

Communications:

ENC 3246

Additional Writing/Public Speaking course (3)

ENC1102 (3 hours) [In model degree but not on official requirement list]

Ethics:

EGS 4034

Core CS:

COP 3502

COP 3503

COT 3100

COP 3530

CDA 3101

CEN 3031

COT 4501

COP 4600

CNT 4007

CIS 4914

EEL 3701C

Interdisciplinary Electives (14 credit hours)

Technical Electives (15 credit hours)

## Proposed Curriculum Changes

*Describe the proposed changes to the curriculum. If the change is to offer the program through UF Online, please explain and attach a letter of support from the Director of UF Online.*

Response:

- Require either ENC 1101 or ENC 1102 (not both) (-3)
- Increase the number of technical electives from 5 to 6 (+3).
- Remove EEL 3701C and COT 4501 from the core course list (-7)
- Add COP 4020 and COP 4XXX (Alg. Abs. & Des.) to the core course list (+6).
- Add one credit of general elective credit (+1).
- Remove CHM 2045 and CHM 2045L from the required course list (-4).
- Add non-specific General Education as required (+4).
- Reduce the number of credits of CNT 4007 from 4 to 3 (-1).
- Reduce the number of credits of COP 3530 from 4 to 3 (-1).
- Increase the number of credits of COP 3502C from 3 to 4 (+1).

- Increase the number of credits of COP 3503C from 3 to 4 (+1).
- Allow COP 3504C to be taken instead of COP 3502C and COP 3503C; If elected, an additional 4 credits are required to complete the program.

Curriculum Changes have no net credit change; program remains 120 credit hours.

### **UF Online Curriculum Change**

*Will this curriculum change be applied to a UF online program as well?*

Response:  
No

### **Pedagogical Rationale/Justification**

*Describe the rationale for the proposed changes to the curriculum.*

Response:  
Computer Science is a rapidly evolving field. The CISE Department aims to bring the CSE major up to date with the national standards; specifically, CISE seeks to match the latest ACM standards detailed elaborated in the Computer Science 2013 (CS2013) And Computing Curricula 2020 (CC2020) national standards.

### **Impact on Enrollment, Retention, Graduation**

*Describe any potential impact of the curriculum changes on students who are currently in the major.*

Response:  
We expect that improving the CSE curriculum will substantially increase the chances of UF graduates in landing high impact, high paying jobs in the ever changing Computer Science field. With the new diversified curriculum, we expect higher enrollment, retention as well as graduation rates.

### **Assessment Data Review**

*Describe the Student Learning Outcome and/or program goal data that was reviewed to support the proposed changes.*

Response:  
We set up a curriculum review committee to study existing curriculum models and suggestions from a wide spectrum of stake holders. Briefly, this committee

- studied ACM CS2013 curriculum report
- studied ACM CC2020 curriculum report
- reviewed computer science curriculum of 15 schools (including top 10 schools as well as teaching schools)
- Conducted multiple town hall meetings and surveys with undergraduate students, industrial partners, and other faculty in the department.

We are attaching the full minutes of the curriculum review committee as a separate document.

### **Academic Learning Compact and Academic Assessment Plan**

*Describe the modifications to the Academic Learning Compact (for undergraduate programs) and Academic Assessment Plan that result from the proposed change.*

Response:

We have proposed to replace one course and its lab (CHM 2045 - General Chemistry and CHM 2045L - General Chemistry Lab) which was a required course originally in the critical tracking with a state core gen-ed course. We do not anticipate any changes in the assessment plan.

**Catalog Copy**

*Submitter agrees to prepare and upload document showing the catalog copy with the current and proposed curricula edited using the "track changes" feature in Word.*

Response:

Yes

## About this program

- College: Herbert Wertheim College of Engineering
- Degree: Bachelor of Science in Computer Science
- Credits for Degree: 120

## Overview

Students in the engineering computer science (EG-CSE) program will satisfy the same requirements for general education and obtain the same engineering pre-professional background in mathematics and science as other engineering students. The program contains a strong technical component comprising a set of required courses covering essential areas in computing and a set of technical electives enabling students to deepen their knowledge in chosen areas of computer science and engineering.

In addition, the program includes a set of interdisciplinary electives in an area of the student's choice from anything the university offers. Students may choose an established minor, a predefined track or if nothing meets their needs, they can work with an advisor to develop their own program. Thus, students will not need to wait for an interdisciplinary program to be established; they can create their own.

To answer the demands of industry for employees with both technical competence and the ability to communicate effectively, the program requires communication courses beyond the usual general education requirements for engineering.

### DEPARTMENT REQUIREMENTS

Students must complete all critical-tracking courses with minimum grades of C in each course and the critical-tracking GPA must be at least 2.5. A minimum grade of C is required in all other courses that are prerequisites to a required course: CDA 3101, [COP 3502C](#), [COP 3503C](#), [COP 3530](#), [COP 4600](#), [and COT 3100](#) ~~and MAS 3114~~. In addition, CISE requires all computer science students to maintain a cumulative, upper-division and department grade point average minimum of 2.0.

Students who do not meet these requirements will be placed on academic probation and will be required to prepare a probation contract with a CISE advisor. Students are normally given two terms to remove their deficit points; however, students who do not satisfy the conditions of the first term of probation may be dismissed from the department.

[Students may opt to take COP 3504C in lieu of COP 3502C and COP 3503C. If elected, students will need to complete an additional 4 credits to complete the degree program.](#)

### PLACEMENT

Students who have scored at least a 4 or 5 on the AP Computer Science exam are eligible to start the programming fundamentals sequence with [COP 3503C](#). Students will need to see an advisor in the major to adjust their degree audit.

## Critical Tracking

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

### SEMESTER 1

- Complete 1 of ~~6~~<sup>7</sup> critical-tracking courses with a minimum grade of C within two attempts: ~~CHM 2045 or CHM 2095~~, MAC 2311, MAC 2312, MAC 2313, COP 3502~~C~~, PHY 2048, PHY 2049
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

### SEMESTER 2

- Complete 1 additional critical-tracking course with a minimum grade of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

### SEMESTER 3

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

### SEMESTER 4

- Complete ~~1~~<sup>2</sup> additional critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

### SEMESTER 5

- Complete all ~~7~~<sup>6</sup> critical-tracking courses with minimum grades of C in each course within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

### Semester 6

- Complete COP 3503~~C~~ and COT 3100
- 2.0 UF and Departmental GPA

### Semester 7

- Complete COP 3530
- 2.0 UF and Departmental GPA

### Semester 8

- [Complete COP 4600 and COP 4020](#)
- [2.0 UF and Departmental GPA](#)

### Model Semester Plan

Students are expected to complete the general education international (GE-N) and diversity (GE-D) requirements. This is often done concurrently with another general education requirement (typically, GE-C, H or S).

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Semester 1		
<del>Select one of the following two</del>		
<del>CHM 2045 or CHM 2095</del>	<del>General Chemistry 1 (Critical Tracking; GE-P) or Chemistry for Engineers (Critical Tracking; GE-P)</del>	<del>3</del>
<del>CHM 2045L EGN2020C</del>	<del>General Chemistry 1 Laboratory (GE-P) Engineering Design &amp; Society (GE-P)</del>	<del>1 2</del>
MAC 2311	Analytic Geometry & Calculus 1 (Critical Tracking; GE-State Core M)	4
COP 3502C	Programming Fundamentals 1 (Critical Tracking)	<del>4</del> 3
<del>IDS 1164</del>	<del>UF Quest 1: What is the Good Life (GE-UF Core-H + D/I)</del>	3
<del>ENC 1101</del>	<del>Expository and Argumentative Writing (State Core GE Composition; Writing Requirement: 6,000 words)</del>	<del>3</del>
Total		<del>17</del> 13
Semester 2		
MAC 2312	Analytic Geometry & Calculus 2 (Critical Tracking; GE-M)	4
PHY 2048	Physics with Calculus 1 (Critical Tracking; GE-State Core P)	3
PHY 2048L	Physics Lab	1
COP 3503C	Programming Fundamentals 2	<del>4</del> 3
COT 3100	Applications of Discrete Structures	3
Total		154

Commented [JB1]: Remove

Commented [JB2]: Remove CHM2045L, Recommend EGN2020C

Commented [JB3]: Move from semester 1 to summer after semester 2

Commented [JB4]: From 14-17



<u>Summer after Semester 2</u>	
<u>State Core Social and Behavioral Sciences (GE-S)</u>	<u>3</u>
<u>State Core Humanities (GE-H)</u>	<u>3</u>
<u>ENC1101 or ENC1102 Expository and Argumentative Writing (State Core GE Composition; Writing Requirement: 6,000 words)</u>	<u>3</u>
<u>Total</u>	<u>9</u>

**Commented [JB5]:** Moved from semester 3 to summer after semester 2

**Commented [JB6]:** Moved from semester 5 to summer after semester 2

**Commented [JB7]:** Moved from Semester 1 to summer after semester 2

<u>Semester 3</u>		
<u>State Core Gen Ed Social and Behavioral Sciences</u>		
MAC 2313	Analytic Geometry & Calculus 3 ( <b>Critical Tracking</b> ; GE-M)	4
PHY 2049	Physics with Calculus 2 ( <b>Critical Tracking</b> ; GE-P)	3
PHY 2049L	Physics Lab	1
<u>CDA 3101</u>	<u>Introduction to Computer Organization</u>	<u>3</u>
COP 3530	Data Structures and Algorithms	<u>3</u>
Total		<del>15</del> <u>14</u>

**Commented [JB8]:** Moved from semester 3 to summer after semester 2

**Commented [JB10]:** From 15

<u>Semester 4</u>		
CEN 3031	Introduction to Software Engineering	3
MAS 3114 or MAS 4105	Computational Linear Algebra or Linear Algebra	3 or 4
<u>CIS 4301</u>	<u>Information &amp; Database Systems 1</u>	<u>3</u>
ENC 3246	Professional Communication for Engineers (Gen Ed Composition; Writing Requirement: 6,000 words)	3
State Core Social and Behavioral Sciences with Diversity or International <u>(GE-S + D/I)</u>		3
Total		<del>15</del> <del>16</del> <del>12</del> <u>13</u>

**Commented [mp11]:** Move from semester 5 to 4

**Commented [mp12]:** Up from 12-13

<u>Semester 5</u>		
<del>COT 4501</del>	<del>Numerical Analysis: a Computational Approach</del>	<del>3</del>
<del>CIS 4301</del>	<del>Information &amp; Database Systems 1</del>	<del>3</del>
<del>CDA 3101</del>	<del>Introduction to Computer Organization</del>	<del>3</del>

**Commented [mp13]:** Remove: No longer required (replaced by technical elective)

**Commented [mp14]:** Move from semester 5 to 4

**Commented [mp15]:** Remove: Move from semester 5 to 3

COP 4600	Operating Systems	3
STA 3032	Engineering Statistics	3
UF Quest 2 (GE-S / GE-H / GE-B/P)		3
Technical Elective 1		3
Interdisciplinary Elective		3
State Core Gen. Ed. Humanities with Diversity or International		3
Total		12.5
Semester 6		
COP 4600	Operating Systems	3
EEL 3701C	Digital Logic and Computer Systems	4
ENC 1102	Argument and Persuasion (Gen Ed Composition; Writing Requirement: 6,000 words)	3
EGN 4034		1
COP 4020	Programming Language Concepts	3
COP 4XXX	Algorithm Abstraction and Design	3
Interdisciplinary Elective(s)		3.6
Technical Elective 2		3
Technical Elective		3
Total		17.15
Summer		
Pursue Internship/Co-op if desired		

**Commented [JB16]:** Moved from semester 6 to semester 5

**Commented [JB17]:** Move from semester 8 to 5

**Commented [JB19]:** Replaces Numerical Analysis requirement

**Commented [JB20]:** Moved from semester 5 to semester 6

**Commented [JB21]:** Moved from semester 5 to summer after semester 2

**Commented [JB22]:** Moved from semester 6 to semester 5

**Commented [JB23R22]:**

**Commented [JB24]:** Removed - no longer required; replaced by Algorithm Abstraction & Design

**Commented [JB25]:** Moved to summer after semester 2

**Commented [JB26]:** Moved from semester 6 to semester 7

**Commented [JB27]:** Added (new degree requirement)

**Commented [JB28]:** Added (new degree requirement); replaces Digital Logic

**Commented [JB29]:** Moved from semester 5/7 to semester 6

**Commented [JB30]:** Moved from semester 6 to semester 8

**Commented [mp31]:** Down from 17

Semester 7		
CNT 4007E	Computer Network Fundamentals	3.4
EGS 4034; or CGS 3065	Professional Ethics; or Legal & Social Issues in Computing	1; or 3
Interdisciplinary Elective(s)		5.3
Technical Elective 3		3
Technical Elective 4		3
Total		13 or 15
Semester 8		

**Commented [JB32]:** Moved from Semester 6 to Semester 7; explicitly added alternative course

CIS 4914; or CIS 4913C	Senior Project; or Integrated Product and Process Design 2	3
<u>STA 3032</u>	<u>Engineering Statistics</u>	<u>3</u>
Interdisciplinary Elective(s)		<del>5</del> 6
<u>Technical Elective 5</u>		<u>3</u>
Technical Elective 6		3
Total		<del>15</del> 14

**Commented [JB33]:** Moved from semester 8 to semester 5

**Commented [JB34]:** Reduced from 6 to 5

Students may elect to take a 4-credit elective earlier in the program so that this is a single 4-credit course.

**Commented [JB35]:** Moved from Semester 6 to Semester 8

## Summary of CSE Undergraduate Curriculum Changes

- Require either **ENC 1101** or **ENC 1102** (not both) (-3)
- Increase the number of technical electives from 5 to 6 (+3).
- Remove **EEL 3701C** and **COT 4501** from the core course list (-7)
- Add **COP 4020** and **COP 4XXX** (Alg. Abs. & Des.) to the core course list (+6).
- Add one credit of general elective credit (+1).
- Remove **CHM 2045** and **CHM 2045L** from the required course list (-4).
- Add **non-specific General Education** as required (+4).
- Reduce the number of credits of **CNT 4007** from 4 to 3 (-1).
- Reduce the number of credits of **COP 3530** from 4 to 3 (-1).
- Increase the number of credits of **COP 3502C** from 3 to 4 (+1).
- Increase the number of credits of **COP 3503C** from 3 to 4 (+1).
- Allow **COP 3504C** to be taken instead of **COP 3502C** and **COP 3503C**; If elected, an addition 4 credits are required to complete the program.

Curriculum Changes have no net credit change; program remains 120 credit hours.

## Degree Requirement - Full List

<b><u>REQUIRED - FOUNDATIONAL</u></b>		<b>ALTERNATIVE</b>	<b>Crit. Tr. Sem</b>
<i>COMPOSITION</i>		3	
ENC3246	Prof. Comm. for Engineers	3	
MAC2311	Analytic Geom. & Calc 1	4	1-5
MAC2312	Analytic Geom. & Calc 2	4	1-5
MAC2313	Analytic Geom. & Calc 3	4	1-5
MAS3114	Comp. Linear Algebra	3	
PHY2048+L	Phys. with Calc 1 & Lab	4	1-5
PHY2049+L	Phys. with Calc 2 & Lab	4	1-5
STA3032	Engineering Statistics	3	
<b>Total</b>		<b>32</b>	
<b><u>REQUIRED - CORE</u></b>			
COP3502C	Prog. Fundamentals I	4	1-5
COP3503C	Prog. Fundamentals II	4	6
COT3100	Appl of Discrete Struct	3	6
CIS4301	Info. and DB Systems 1	3	
COP3530	Intro. to Data Struct & Alg	3	7
CDA3101	Intro. to Comp. Org.	3	
CEN3031	Intro. to Software. Eng.	3	
COP4020	Prog. Lang. Concepts	3	
COP4XXX	Alg. Abs. & Design	3	
COP4600	Operating Systems	3	8
CNT4007	Comp. Network Fund.	3	

EGS4034	Professional Ethics	1	<u>ALTERNATIVE</u>		
CIS4914	Senior Project	3	CGS3065	Leg Soc Issues Comp.	3
			CIS4913C	Int. Prod. Proc. Des 2	3
<b>Total Credits</b>		<b>39</b>			<b>41</b>

**REQUIRED - MAJOR ELECTIVES**

Any 4000-level or higher CISE course, beyond Core Req.	18
<b>Total Credits</b>	<b>18</b>

**REQUIRED - GENERAL EDUCATION**

EGN2020C	<i>Eng. Des. &amp; Society</i>	2
	<i>HUM, SOC SCIENCE, OR BIO / PHY SCI</i>	3
	<i>HUMANITIES (GE-H)</i>	6
	<i>SOCIAL SCIENCE (GE-S)</i>	6
<b>Total Credits</b>		<b>17</b>

ALTERNATIVE

<u>GEN ELECTIVE</u>	1
<i>SOC SCI, OR BIO / PHY</i>	4
<i>HUMANITIES (GE-H)</i>	6
<i>SOCIAL SCIENCE (GE-S)</i>	6
	<b>17</b>

**REQUIRED - GENERAL ELECTIVES**

<i>INTERDISCIPLINARY ELECTIVES</i>	14
<b>Total Credits</b>	<b>14</b>

**GRAND TOTAL** **120**