- Computing & Information Technology
- Computer Science
- Computer Security
- Game Design and Development
- Human Centered Computing
- New Media Development
- Software Engineering
- Web and Mobile Computing

Computing and Information Technologies - Undergraduate Program Schedule

- Indicate academic calendar type: _X_Semester ___Quarter ___ Trimester ___Other (describe)

Term: Fall 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-120 Comp Problem Solving-Info Dom I	4	X			
NSSA-102 Comp System Concepts	3		X		
First Year Writing (WI)	3	X			
MATH-131 Discrete Math (P-7A)	4	X			
Liberal Arts and Sciences (P-1, Ethical)	3	X			
Year One	0				
Term credit total:	17	14	3		
Term: Fall 2		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
NSSA-220 Task Automation w/Interp Lang	3		X		ISTE-121
ISTE-140 Web & Mobile I	3		X		
NSSA-241 Intro to Routing and Switching	3		X		NSSA-102
STAT-145 Introduction to Statistics I	3	X			
Liberal Arts and Sciences (P-2, Artistic)	3	X			

Term: Spring 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-121 Comp Problem Solving-Info Dom II	4	X			ISTE-120
CSEC-102 Information Assurance and Security	3		X		
COMM 142 Introduction to Technical Communications (WI)	3	X			
MATH-161 Applied Calc (P-7B)	4	X			
Liberal Arts and Sciences (P-3, Global)	3	X			
Wellness Activity	0				
Term credit total:	17	14	3		
Term: Spring 2		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
NSSA-221 Sys Admin I	3		X		NSSA-220;NSSA-102;NSSA-241
ISTE-230 Intro to Database & Data Mod	3	X			ISTE-120
ISTE-240 Web & Mobile II	3		X		ISTE-120;ISTE-140
Liberal Arts and Sciences Elective (WI)	3	X			
Liberal Arts and Sciences (P-5, Natural Science Inquiry)	4	X			

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Wellness Activity	0					ISTE-099 Second Year Seminar	0				
Term credit total:	15	6	9			Term credit total:	16	7	9		
Coop 1 (After Sophomore year)											
Term: Fall 3 GLOBAL / CROATIA		Check course classification (s)				**Term: Spring 3**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
CIT Concentration Course 1	3		X			CIT Concentration Course 2	3		X		
Liberal Arts and Sciences (P-6, Scientific Princ)	4	X				CIT Concentration Course 3	3		X		
ISTE-260 Designing the User Exp	3		X		ISTE-140	ISTE-430 Info Requirements Modeling	3		X		ISTE-230
Liberal Arts and Sciences (P-4, Social)	3	X				Liberal Arts and Sciences (I-1)	3	X			
Free Elective 1	3					Free Elective 2	3				
Term credit total:	16	7	6			Term credit total:	15	3	9		
Coop 2 (Before Senior year)											
Term: Fall 4		Check course classification (s)				**Term: Spring 4**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
ISTE-500 Senior Development Project I	3		X		Completion of 2 Coop	ISTE-501 Senior Development Project II (WI)	3		X		ISTE-500
CIT Concentration Course 4	3		X			CIT Concentration Course 6	3		X		
CIT Concentration Course 5	3		X			Liberal Arts and Sciences (I-3)	3	X			
Liberal Arts and Sciences (I-2)	3	X				Free Elective 4	3				
Free Elective 3	3					Free Elective 5	3				
Term credit total:	15	3	9			Term credit total:	15	3	6		

Program Totals:	**Credits: 126**	**Liberal Arts & Sciences: 60**	**Major: 51**	**Elective & Other: 15**

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course **Prerequisite(s):** list prerequisite(s) for the noted courses

Liberal Arts & Sciences Courses

The Liberal Arts & Sciences courses listed as 4(3) credits above can be either 3 or 4 credits, as long as the student has a total of 60 LAS credits at graduation. Taking a 4 credit P-5, P-6, P7A and P-7B are preferred, but not required.

Concentrations

Students matriculated in this degree will select two three-course concentration representing eighteen semester hours of work (nine each). Concentrations and corresponding courses are listed below.

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Web Development

ISTE 340 Client Programming

ISTE 341 Server Programming

SWEN 383 Software Design Principles & Patterns

Networking and Communications (*245 Required, pick 2 of following 6)

NSSA 245 Network Services*

NSSA 242 Wireless Networking

NSSA 370 Project Management

NSSA 342 VoIP & Unified Comm II

NSSA 441 Advanced Routing and Switching

NSSA 443 Network Design and Performance

NSSA 445 Sensor & Ad-Hoc Networks

Enterprise Administration (*320 and 322 Required, pick one of following 4)

NSSA 320 Configuration Management*

NSSA 322 Systems Administration II*

NSSA 244 Virtualization

NSSA 370 Project Management

NSSA 422 Storage Architectures

NSSA 423 Scalable Computing Architectures

NSSA 425 Data Center Operations

NSSA 427 Scalable Web Services Architectures

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Database Applications

ISTE 330 Database Connectivity & Access

ISTE 422 App Develop Practices

ISTE 434 Data Warehousing

ISTE 436 Database Management and Access

ISTE 432 Database Application Development

ISTE 438 Contemporary Databases

Special Topics

A three course, nine-semester hour special topics concentration is available to selected students who wish to pursue an in-depth study of an area not present in the program's concentration offerings. The student will develop a special concentration proposal with the faculty advisor. The head of the academic unit will review the proposal and will approve or deny the request. Only one special topics concentration will be allowed to any given student.

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Computer Science - Undergraduate Program Schedule

Brief Change Log:

1) Based on the most recent version of table 1 for the BS degree in Computer Science under semesters – originally submitted May 3, 2016
2) The suggested schedule for students doing study abroad places the study abroad semester during the spring term of year 4, but other options are possible.
3) The first three years of the suggested study abroad schedule are identical to that of the "regular" BS degree in Computer Science that does not include a study abroad term as is the recommendation to do the final semester of required co-op during term fall 5.
4) Suggested courses for terms fall 4, spring 4, and spring 5 have been rearranged in order to accommodate the greatest number of study abroad opportunities, while still adhering to both scheduling and prerequisite constraints.

Table 1a: Undergraduate Program Schedule
Computer Science BS

- Indicate academic calendar type: _**X**_Semester ___Quarter ___ Trimester ___Other (describe)
- Label each term in sequence, consistent with the institution's academic calendar (e.g., Fall 1, Spring 1, Fall 2)
- Copy/expand the table as needed to show additional terms

Term: Fall 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI 141 Computer Science I	4		X		None
MATH 181 Project-Based Calculus I (counts as General Education Perspectives course) **P-7A**	4	X			Math Placement Exam score
General Education Elective (required part of General Education Framework Foundation) (see Note 1) **F-1**	3	X			

Term: Spring 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI 142 Computer Science II	4		X		CSCI 141 with grade of "C-" or better
MATH 182 Project-Based Calculus II (counts as General Education Perspectives course) **P-7B**	4	X			C- or better in (MATH 181 or MATH 173 or 1016 282) or (MATH 171 and MATH 180) or equivalent courses
MATH 190 Discrete Mathematics for Computing (counts as General Education Electives course) **E-1**	3	X			None (co-requisites MATH 182 or MATH 182A or MATH 172 or equivalent courses)

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First-Year Writing (**students choose one of several approved Writing Intensive courses**) (required part of General Education Framework Foundation) (see Note 1)	3	X				General Education Framework Perspectives Course (chosen from Ethical category) **P-2**	3	X			
General Education Framework Perspectives Course **P-1**	3	X									
General Education Framework Perspectives Course **P-3**	3	X				General Education Framework Perspectives Course **P-4**	3	X			
YOPS 010 Year One	0				Updated first year requirement as of 2191New	Wellness Activity	0				Institute requirement
Term credit total:	17	13	4			Term credit total:	17	13	4		
Term: Fall 2		Check course classification (s)				**Term: Spring 2**		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
CSCI 243 The Mechanics of Programming	3		X		CSCI 142 with grade of "C-" or better or CSCI 140 with grade of "C-" or better or CSCI 242 with grade of "C-" or better	CSCI 261 Analysis of Algorithms or CSCI 264 Honors Analysis of Algorithms	3		X		(CSCI 243 or SWEN 262) and MATH 190
CSCI 262 Introduction to Computer Science Theory or CSCI 263 Honors Introduction to Computer Science Theory	3		X		CSCI 141 and MATH 190	SWEN 261 Introduction to Software Engineering	3		X		CSCI 142 or CSCI 242 or CSCI 140 or 4003 243
MATH 251 Probability and Statistics I (counts as General Education Electives course) **E-2**	3	X			MATH 182 or MATH 172 or MATH 182A or 1016 282 or equivalent courses	MATH 241 Linear Algebra (counts as General Education Electives course) **E-3**	3	X			MATH 190 or MATH 200 or MATH 219 or MATH 220 or MATH 221 or MATH 221H or equivalent courses
Lab Science I (see Note 2) (counts as General Education Perspectives course) **P-5**	4	X				Lab Science 2 (see Note 2) (counts as General Education Electives course) **E-4**	4	X			
General Education Elective (required part of General Education Framework Foundation) (see Note 1) E-7	3	X				General Education Perspectives Course **P-5**	3	X			

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Wellness Activity	0				Institute requirement		CSCI 099 Co-op Seminar	0		X		Requirement for registering for co-op
Term credit total:	16	10	6				Term credit total:	16	10	6		

Term: Summer 2	Check course classification (s)						**Term: Fall 3**	Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)		**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
Co-op (see Note 3)	0		X				CSCI 331 Introduction to Artificial Intelligence	3		X		CSCI 261 or CSCI 264 and (MATH 251 or STAT 205)
							CSCI 320 Principles of Data Management	3		X		CSCI 142 and MATH 190
							CSCI 250 Concepts of Computer Systems	3		X		CSCI 243 and MATH 190
							Science Elective Course 1 (see Note 2) (counts as General Education Electives course) **E-5**	3		X		
							General Education Framework **Writing Intensive course**) (see Note 4) (counts as General Education Immersion course) **I-1**	3	X			
Term credit total:	0	-	-	Student registers for co-op and is considered full time			Term credit total:	15	6	9		

Term: Spring 3	Check course classification (s)					**Term: Fall 4**	(Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
Co-op	0		X			CSCI 251 Concepts of Parallel and Distributed Systems	3		X		(CSCI 243 or SWEN 262) and MATH 190
						CS Elective Course 1	3		X		
						CSCI 344 Programming Language Concepts	3		X		(CSCI 243 or SWEN 250 or IGME 309) and MATH 190
						Science Elective Course 2 (see Note 2) (counts as General Education Electives course) **E-6**	3	X			
						CSCI 471 Professional Communications (**approved Writing**	3		X		4th or 5th year standing in CS

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Term credit total:	0	-	-	Student registers for co-op and is considered full time	

Term: Spring 4 GLOBAL/STUDY ABROAD		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
Free Elective Course 1	3				
Free Elective Course 2	3				
Free Elective Course 3	3				
General Education Framework Electives course **E-8**	3	X			
General Education Framework (counts as General Education Immersion course) **I-2**	3	X			
Term credit total:	15	6	0	Student also takes 9 credits of free electives	

Term: Spring 5		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CS Elective Course 3 (from the same cluster as CS Elective Course	3		X		
CS Elective Course 4 (from the same cluster as CS Elective Course 3)	3		X		
CS Elective Course 2	3		X		
General Education Framework (counts as General Education Immersion course) **I-3**	3	X			
Free Elective Course 4	3				
Term credit total:	15	3	9	Student also takes 3 credits of free electives	

Intensive course in program)					
Term credit total:	15	3	12		

Term: Fall 5		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
Co-op	0		X		
Term credit total:	0	-	-	Student registers for co-op and is considered full time	

Term:		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
Term credit total:					

Program Totals:	**Credits: 126**	**Liberal Arts & Sciences: 64**	**Major: 50**	**Elective & Other: 12**

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course **Prerequisite(s):** list prerequisite(s) for the noted courses

NOTES:

Updated 8/28/19

(1) The General Education Framework includes a General Education Elective (effective with the 2015-2016 academic year) (3 semester credits) and a First-Year Writing Intensive course (currently students choose from URWT 150 or ENGL 150 or ISTE 110) (3 semester credits).

(2) Students must complete one of the following lab science sequences: (a) PHYS 211 and 212 (University Physics I and II), (b) CHMG 141/145 and 142/146 (General & Analytical Chemistry I/General & Analytical Chemistry I Lab and General & Analytical Chemistry II/General & Analytical Chemistry II Lab), or (c) BIOL 101/103 and 102/104 (General Biology I/General Biology I Lab and General Biology II/General Biology II Lab). Students are free to choose from approved science electives that either extend or complement their lab science selection. Valid science electives must be approved for General Education and must meet department criteria.

(3) A student must complete a minimum of two semesters and one summer of co-op. The schedule presented in table 1a represents only one of several equally valid potential schedules. Students have the flexibility to arrange their co-op's to be completed using a different pattern. In support of this, it should be noted that all required Computer Science courses shown above as taken in fall 3, fall 4, and spring 5 are scheduled to be offered during fall and spring semesters as well as the summer session.

(4) The General Education Framework requires students to select eight courses that cover the seven Perspectives categories known as: Ethical, Artistic, Global, Social, Natural Science Inquiry, Scientific Principles, and Mathematical (two courses are selected from this last category). Programs may require specific courses in up to three Perspectives categories. Computer Science will have required choices for students in three Perspectives categories: one of several possible ethics courses in the Ethical Perspective (currently students choose from PHIL 306 or PHIL 102 or PHIL 202); their first lab science course (see note (2) in the Natural Science Inquiry Perspective (but this course can also be counted under the Scientific Principles Perspective); the two calculus courses in the Mathematical Perspective.

    Programs may require specific courses for use as General Education Electives. Computer Science requires six of the possible seven General Education Electives to consist of: MATH 190, 251, and 241 (all part of the Mathematical Perspective); Lab Science Course 2 and Science Elective Courses 1 and 2 (once again we opt to count these courses as part of the Scientific Principles Perspective). This leaves one General Education Elective for students to choose for themselves. Students also have the option to count one of their Science Elective courses toward their Scientific Principles Perspective, thus giving themselves one more General Education Elective to choose for themselves.

    Which General Education courses carry the Writing Intensive (WI) designation is constantly evolving. We designated course I-1 from General Education as an example only to confirm that we would complete the requirement by year 3.

(5) Courses designated as General Education are identified with a letter indicating the category (F for Foundation; P for Perspectives; I for Immersion; E for Electives) followed by a number (to distinguish courses within a category).

Computer Security - Undergraduate Program Schedule

Indicate academic calendar type: __x_Semester ___Quarter ___ Trimester ___Other (describe)

Term: Fall 1st Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSEC 101 Fundamentals of Computing Security	3		X		
CSCI 141 Computer Science I (counts as General Education Electives course 1) **E-1**	4	X			
General Education Perspectives Course P-1	3	X			
MATH 181 Project-Based Calculus I (counts as General Education Perspectives course 7) **P-7A**	4	X			
General Education Framework Perspectives Course **P-2**	3	X			
Term credit total:	17	14	3		

Term: Spring 1st Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
MATH 182 Project-Based Calculus II (counts as General Education Perspectives course 8) **P-7B**	4	X			MATH 181
MATH 190 Discrete Mathematics for Computing (counts as General Education Electives course 3) **E-3**	3	X			MATH 181 (MATH 182 is a co-requisite)
CSCI 142 Computer Science II (counts as General Education Electives course 2) **E-2**	4	X			CSCI 141
Freshman Writing Intensive Course (required part of General Education Framework Foundation) **F-2**	3	X			
NSSA 241 Introduction to Routing and Switching	3		x		CSEC-101
Term credit total:	17	14	3		

Term: Fall 2nd Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI 243 The Mechanics of Programming	3		X		CSCI 142 or CSCI 140 or CSCI 242

Term: Spring 2nd Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI 250 Concepts of Computer Systems	3		X		CSCI 243 and MATH 190

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MATH 251 Probability and Statistics I (counts as General Education Electives course) **E-4**	3	X			MATH 182
General Education Framework Perspectives Course **P-4**	3	X			
PHYS-211 University Physics I (counts as General Education Perspectives Course 5) **P-6**	4	X			MATH 181 (co-reg MATH 182)
NSSA 245 Network Services	3		X		CSCI 141 and NSSA-241
Term credit total:	16	10	6		

NSSA 221 System Admin I	3		X		**CSCI 141 and NSSA 241**
MATH 241 Linear Algebra / MATH 252 Probability and Statistics II (counts as General Education Electives course) **E-5**	3	X			MATH 190/ MATH 251
PHYS-212 University Physics II (counts as General Education Perspectives Course 6) **E-6**	4	X			PHYS-211 and MATH 182
General Education Perspectives Course **P-3**	3	X			
CSEC-099 Cooperative Education Seminar	0				Second year standing
Term credit total:	16	10	6		

Cooperative Education: Summer after 2nd Year

Term: Fall 3rd Year – GLOBAL / CROATIA		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
General Education Framework (**Writing Intensive course**) (counts as General Education Immersion course) **I-1**	3	X			
General Education Course (PHIL 102/202/306) E-4	3	X			
Free Elective 1	3				
Free Elective 2	3				
ISTE 230 Intro Database and Data Modeling	3		X		CSCI 142 or NSSA 220

Term: Spring 3rd Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSEC-472 Authentication and Security Models	3		X		CSCI 462
CSEC-380 Principles of Web Application Security	3		X	X	(CSEC-101 or NSSA-221) and NSSA-245
CSEC Elective Course 1	3		X		
CSCI-462-Introduction to Cryptography	3		X		MATH 190 and CSCI 243
PUBL-363 Cyber Security Policy and Law	3	X			

Term credit total:	15	6	3		Student also takes 6 credits of free electives

Term: Fall 4th Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSEC Elective Course 2	3		X		
CSEC Elective Course 3	3		X		
General Education Framework (counts as General Education Immersion course) **I-2**	3	X			
Free Elective Course 3	3				
CSEC Elective Course 4	3		X		
Term credit total:	15	3	9		Student also takes 3 credits of free electives

Term credit total:	15	3	12		

Cooperative Education: Summer after 3rd Year

Term: Spring 4th Year		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
GCCIS-CSEC-490 Capstone in Computing Security (**Writing Intensive course)**	3		X		4th year status and departmental approval
General Education Framework (counts as General Education Immersion course) **I-3**	3	X			
CSEC Elective Course 5	3		X		
CSEC Elective Course 6	3		X		
Free Elective Course 4	3				
Term credit total:	15	3	9		Student also takes 3 credits of free electives

Program Totals: **Credits: 126** **Liberal Arts & Sciences: 63** **Major: 51** **Elective & Other: 12**

(6)

(7)

(8)

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Game Design & Development - Undergraduate Program Schedule

- Indicate academic calendar type: __X_Semester ___Quarter ___ Trimester ___Other (describe)
- Label each term in sequence, consistent with the institution's academic calendar (e.g., Fall 1, Spring 1, Fall 2)
- Copy/expand the table as needed to show additional terms

Term: Fall 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-105 Game Development and Algorithmic Problem Solving I	4	4			None
IGME-110 Introduction to Interactive Media	3		3		None
Perspectives 1 (Social)	3	3			
First Year Writing	3	3			
MATH-131 Discrete Mathematics	4	4			None
ACSC 010 Year One	0				
Term credit total:	17	14	3		

Term: Spring 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-106 Game Development and Algorithmic Problem Solving II	4	4			C- or better in IGME-105
IGME-119 2D Animation & Asset Production	3		3		IGME-110
Perspective 2 (Global)	3	3			
PHYS-111 College Physics I	4	4			None
MATH-185 Mathematics of Graphical Simulation I	3	3			MATH-101, 111, 131 , 171 or 181 ,
Term credit total:	17	14	3		

Term: Fall 2		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-202 Interactive Media Development	3		3		(C- or better in IGME-106 OR IGME-201) AND MATH-185
IGME-219 3D Animation & Asset Production	3		3		IGME-119
IGME-230 Website Design &	3		3		(IGME-102 OR IGME-106) AND IGME-110
Perspectives 3 (Ethical)	3	3			
MATH-186 Mathematics of Graphical Simulation II	3	3			MATH-185
IGME-099 Co-op Preparation Workshop	0				Second-year standing
Wellness Education**	0				
Term credit total:	15	6	9		

Term: Spring 2		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-220 Game Design & Development I	3		3		IGME-202
IGME-209 Data Structures & Algorithms for Games & Simulations I	3		3		IGME-202, (PHYS-111 or PHYS 211) or (PHYS 206 and PHYS 208), AND MATH-185
IGME-236 Interaction, Immersion, & the Media Interface (WI) Implementation	3		3		(IGME-102 OR IGME-106) AND IGME-110
Perspectives 4 (Scientific)	3	3			
Perspectives 5 (Artistic)	3	3			
Wellness Education**	0				
Term credit total:	15	6	9		

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Term: Fall 3		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-320 Game Design & Development II	3		3		IGME-220
IGME-309 Data Structures & Algorithms for Games & Simulations II	3		3		IGME-209 AND (Math 182 or MATH 186)
General Education Elective	3	3			
General Education Elective	3	3			
Immersion	3	3			
Term credit total:	15	9	6		

Term: Fall 4 GLOBAL / CROATIA		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
FREE ELECTIVE (4)	3		3		
FREE ELECTIVE (5)	3		3		
FREE ELECTIVE (3)	3		3		
General Education Elective	3	3			
General Education Elective	3	3			
Term credit total:	15	6	9		

Term: Summer 2*		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-499 Undergraduate Co-op	0				1st and 2nd year major core complete
Term credit total:	0				

Term: Spring 3		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-330 Rich Media Web Application Development I	3		3		IGME-230
IGM/GDD ADVANCED ELECTIVE (1)	3		3		
FREE ELECTIVE (1)	3		3		
FREE ELECTIVE (2)	3		3		
Immersion	3	3			
Term credit total:	15	3	12		

Term: Spring 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGM/GDD ADVANCED ELECTIVE (4)	3		3		
IGM/GDD ADVANCED ELECTIVE (2)	3		3		
IGM/GDD ADVANCED ELECTIVE (3)	3		3		
Immersion	3	3			
General Education Elective	3	3			
Term credit total:	15	6	9		

Term: Summer 3*		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-499 Undergraduate Co-op	0				1st and 2nd year major core complete
Term credit total:	0				

Program Totals:	**Credits: 124**	**Liberal Arts & Sciences: 64**	**Major: 45**	**Elective & Other: 15**

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course **Prerequisite(s):** list prerequisite(s) for the noted courses

* NOTE: Cooperative Education consists of two real-world work experiences designed to supplement the educational experience. The cooperative education requirement consists of two semesters (or summers) of experience taken after the 2nd year. Acceptable activities should consist of 350 work hours and should be evaluated by a supervising professional associated with the game design and development and/or computing field. Experiences included paid work experiences, , entrepreneurial activities, as well as faculty supervised research and innovation activities.

**Can be taken at any time though the students career

Updated 8/28/19

BS Game Design and Development – IGM/GDD Advanced Electives

The IGM/GDD Advanced Electives consist of courses that are approved by IGM faculty on a case by case basis as appropriate to student preparation and trends in the field, as a part of individual plans of study. IGM/GDD Advanced Electives are offered from the Interactive Games and Media unit, as well as other units (such as Computer Science) with appropriate coursework. The following list is non-exhaustive but is representative of the course offerings currently approved for 2013 conversion.

Course Number	Course Name	Pre-requisite(s)
IGME-430	Rich Media Web Application Development II	IGME-330
IGME-440	Online Virtual Worlds & Simulations	IGME-202 AND (MATH 182 or MATH 186)
IGME-450	Casual Game Development	IGME 330
IGME-451	Systems Concepts for Games and Media	IGME-309
IGME-470	Physical Computing & Alternative Interfaces	IGME-202
IGME-529	Foundations of Interactive Narrative	IGME-202
IGME-540	Foundations of Game Graphics Programming	IGME-309
IGME-550	Foundations of Game Engine Design & Development	IGME-540
IGME-560	Artificial Intelligence for Game Environments	IGME-309
IGME-570	Digital Audio Production	IGME- 202
IGME-571	Interactive Game Audio	IGME-570 and IGME 202
IGME-580	IGM Production Studio	3rd Year Standing

Updated 8/28/19

Course Number	Course Name	Pre-requisite(s)
IGME-581	Innovation & Invention	3rd Year Standing
IGME-582	Humanitarian Free & Open Source Software Development	
IGME 583	Legal/Business Aspects of FOSS	IGME 582
IGME 584	Linux Software Development	IGME 582
IGME 585	Project in FOSS Development	IGME 582
IGME 589	Research Studio	3rd year standing
IGME-590	Undergraduate Seminar in IGM	Varies
IGME-599	Independent Study	Permission of Instructor

Updated 8/28/19

Human Centered Computing - Undergraduate Program Schedule

- Indicate academic calendar type: _X_Semester ___Quarter ___ Trimester ___Other (describe)

Term: Fall 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-120 Comp Prob Solving – Info Domain I	4	X			
ISTE-140 Web & Mobile I	3		X		
ISTE-110 Ethics in Computing (First Year Writing Intensive)	3	X			
Liberal Arts and Sciences Elective	3	X			
PSYC-101 Intro Psychology (P-6, Scientific Principles)	3	X			
Year One	0				
Term credit total:	16	13	3		

Term: Spring 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-121 Comp Prob Solving–Info Domain II	4	X			ISTE-120
ISTE-240 Web & Mobile II	3		X		ISTE-120, ISTE-140
PSYC-223 Cognitive Psychology	3	X			PSYC-101
STAT-145 Introduction to Statistics I (P-7A)	3	X			
NMDE-111 New Media Digital Design Survey I	3		X	X	
Wellness Activity	0				
Term credit total:	16	10	6		

Term: Fall 2		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
PSYC-250 Research Methods 1 (WI)	3	X			PSYC-101, STAT 145
ISTE-262 Foundations of HCC	3		X	X	ISTE-120, ISTE-140, NMDE-111
Liberal Arts and Sciences (P-5, Natural Science Inquiry)	3	X			

Term: Spring 2		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
PSYC -251 Research Methods 2	3	X			PSYC-250
ISTE-266 Design for Accessibility	3		X	X	ISTE-264
Liberal Arts and Sciences (P-4, Social)	3	X			

NMDE-112 New Media Digital Design Survey II	3		X	X	NMDE-111	ISTE-264 – Prototyping & Usability Testing	3		X		ISTE-262
STAT-146 Introduction to Statistics II (P-7B)	4	X			STAT-145	Free Elective 1	3				
Wellness Activity	0					ISTE-099 Second Year Seminar	0				
Term credit total:	16	10	6			Term credit total:	15	6	6		

Coop 1 (After Sophomore year)

Term: Fall 3 GLOBAL / CROATIA		Check course classification (s)				**Term: Spring 3**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
Liberal Arts and Sciences (P-3, Global)	3	X				HCC Concentration Course 3	3		X		
Free Elective 3	3		X			HCC Concentration Course 4	3		X		
ISTE-252 Foundations of Mobile	3		X			HCC Concentration Course 2	3				
Liberal Arts and Sciences (P-2, Artistic)	3	X				HCC Concentration Course I	3	X			
Free Elective 2	3		X			Liberal Arts and Sciences (I-1)	3	X			
Term credit total:	15	3	9			Term credit total:	15	6	6		

Coop 2 (before Senior Year)

Term: Fall 4		Check course classification (s)				**Term: Spring 4**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
ISTE-500 Senior Development Project I	3		X		Coop (2) Req completed	ISTE-501 Senior Development Project II (writing intensive)	3		X		ISTE-500
HCC Concentration Course 5	3		X			HCC Concentration Course 6	3		X		
Liberal Arts and Sciences (P-1, Ethical)	3	X				Liberal Arts and Sciences (I-3)	3	X			
Liberal Arts and Sciences (I-2)	3	X				Liberal Arts and Sciences Elective	3	X			
Free Elective 4	3										

Term credit total:	15	6	6			Term credit total:	12	6	6	
Program Totals:	**Credits: 120**		**Liberal Arts & Sciences: 60**		**Major: 48**	**Elective & Other: 12**				

Notes

Both Scientific perspectives (P-5 & P-6) require a minimum 3 credit course. The student could choose one of the 4 credit courses for either (or both), but it is not required.

Concentrations

Students matriculated in this degree will select two three-course concentrations representing eighteen semester hours of work (nine each). Concentrations and corresponding courses are listed below.

Design

- NMDE-201 Elements II
- NMDE-203 Interactive II
- NMDE-302 GUI

Psychology

- PSYC-330 Memory & Attention
- PSYC-331 Language & Thought
- PSYC-332 Decision Making, Judgment & Problem Solving

Front End Development

- ISTE-340 Client Programming
- ISTE-454 Mobile Application Development I
- ISTE-456 Mobile Application Development II

Accessibility

- ISTE-362 Access & Assistive Technology (new)
- ISTE-462 Research in Accessibility (new)
- ISTE-464 Accessibility through the Lifespan (new)

Instructional Technology

- ISTE-560 Fund Instruct Tech
- ISTE-561 Interactive Courseware
- PSYC-235 Learning & Behavior

Natural Language Processing Concentration: (ENGL-351 & ENGL-581 Required, pick one of ENGL-582 OR ENGL-584)

- ENGL-351 Language Technology
- ENGL-581 Introduction to Natural Language Processing
- ENGL-582 Seminar in Computational Linguistics
- ENGL-584 Spoken Language Processing

Special Topics

A three course, nine-semester hour special topics concentration is available to selected students who wish to pursue an in-depth study of an area not present in the program's concentration offerings. The student will develop a special concentration proposal with the faculty advisor. The head of the academic unit will review the proposal and will approve or deny the request.

New Media Interactive Development - Undergraduate Program Schedule

- Indicate academic calendar type: __X_Semester ___Quarter ___ Trimester ___Other (describe)
- Label each term in sequence, consistent with the institution's academic calendar (e.g., Fall 1, Spring 1, Fall 2)
- Copy/expand the table as needed to show additional terms

Term: Fall 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-101 New Media Interactive Design and Algorithmic Problem Solving I	4	4			None
IGME-110 Introduction to Interactive Media	3		3		None
NMDE 111 New Media Design Digital Survey I	3		3		None
First Year Writing	3	3			
MATH-131 Discrete Mathematics	4	4			none
Year One	0				
Term credit total:	17	11	6		

Term: Spring 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-102 New Media Interactive Design and Algorithmic Problem Solving II	4	4			C- or better in IGME-101
NMDE 112 New Media Design Digital Survey II	3		3		NMDE-111
Perspectives 1 (Natural Science)	3	3			
Perspectives 2 (Artistic)	3	3			
MATH-185 Mathematics of Graphical Simulation I	3	3			MATH-101, 111, 131, 171, OR 181
Term credit total:	16	13	3		

Term: Fall 2		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-201 New Media Interactive Design and Algorithmic Problem Solving III	3		3		C- or better in IGME 102
IGME-230 Website Design & Implementation	3		3		(IGME-102 OR IGME-106) AND IGME-110
Perspectives 3 (Ethical)	3	3			
Perspectives 4 (Global)	3	3			
MATH-186 Mathematics of Graphical Simulation II	3	3			MATH 185
IGME-099 Co-op Preparation Workshop***	0				Second-year standing
Wellness Education**	0				
Term credit total:	15	9	6		

Term: Spring 2		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-202 Interactive Media Development	3		3		(C- or better in IGME-106 OR IGME-201) AND MATH-185
IGME-236 Interaction, Immersion, & the Media Interface (WI)	3		3		(IGME-102 OR IGME-106) AND IGME-110
Perspective 5 (Social)	3	3			
Perspective 6 (Scientific)	3	3			
IGME 330 Rich Media Web App Dev 1	3		3		IGME 230
Wellness Education**	0				
Term credit total:	15	9	6		

Term: Fall 3 GLOBAL / CROATIA		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
General Education Elective	3	3			
FREE ELECTIVE (2)	3		3		
FREE ELECTIVE (3)	3		3		
Immersion	3	3			
General Education Elective	3	3			
Term credit total:	15	6	9		

Term: Fall 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
NMDE-401 New Media Design Career Skills	3		3		4th Year Standing
IGM/NMID Advanced ELECTIVE (5)	3		3		
IGM/NMID Advanced ELECTIVE (1)	3		3		
IGM/NMID Advanced elective (2)	3		3		
Immersion	3	3			
Term credit total:	15	3	12		

Term: Summer 2*		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-499 Undergraduate Co-op	0				1st and 2nd year major core complete
Term credit total:	0				

Term: Spring 3		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGM/NMID Advanced ELECTIVE (3)	3		3		
IGM/NMID Advanced ELECTIVE (4	3		3		
FREE ELECTIVE (1	3		3		
Immersion	3	3			
General Education Elective	3	3			
Term credit total:	15	6	9		

Term: Spring 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-588 New Media Team Project	3		3		4th Year Standing
FREE ELECTIVE (4)	3		3		
FREE ELECTIVE (5)	3		3		
General Education Elective	3	3			
General Education Elective	3	3			
Term credit total:	15	6	9		

Term: Summer 3*		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
IGME-499 Undergraduate Co-op	0				1st and 2nd year major core complete
Term credit total:	0				

Program Totals:	**Credits: 123**	**Liberal Arts & Sciences: 63**	**Major: 45**	**Elective & Other: 15**

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course **Prerequisite(s):** list prerequisite(s) for the noted courses

NOTES: * Cooperative Education consists of two real-world work experiences designed to supplement the educational experience. The cooperative education requirement consists of two semesters (or summers) of experience taken after the 2nd year. Acceptable activities should consist of 350 work hours and should be evaluated by a supervising professional associated with the new media and/or computing field. Experiences included paid work experiences, , entrepreneurial activities, as well as faculty supervised research and innovation activities.

**Can be taken at any time though the students career

***Can be taken during fall or spring of a student's second year

BS New Media Interactive Development – IGM/NMID Program Electives

The IGM/NMID Program Electives consist of courses that are approved by IGM faculty on a case by case basis as appropriate to student preparation and trends in the field, as a part of individual plans of study. IGM/NMID Program Electives are offered from the Interactive Games and Media unit, as well as other units (such as New Media Design) with appropriate pre-requisite coursework. The following list is non-exhaustive but is representative of the course offerings currently approved for 2013 conversion.

Course Number	Course Name	Pre-requisite(s)
IGME-119	2D Animation & Asset Production	IGME-110
IGME-219	3D Animation & Asset Production	IGME-119
IGME-340	Multi-platform Media App Development	IGME-106 or IGME-201
IGME-430	Rich Media Web Application Development II	IGME-330
IGME-440	Online Virtual Worlds & Simulations	IGME-202 AND (MATH 182 or MATH-186)
IGME-450	Casual Game Development	IGME 330
IGME-470	Physical Computing & Alternative Interfaces	IGME-202
IGME-529	Foundations of Interactive Narrative	IGME-202
IGME-570	Digital Audio Production	IGME- 202
IGME-571	Interactive Game Audio	IGME 202
IGME-580	IGM Production Studio	3rd Year Standing

Course Number	Course Name	Pre-requisite(s)
IGME-581	Innovation & Invention	3rd Year Standing
IGME-582	Humanitarian Free & Open Source Software Development	3rd Year Standing
IGME 583	Legal/Business Aspects of FOSS	IGME 582
IGME 584	Linux Software Development	IGME 582
IGME 585	Project in FOSS Development	IGME 582
IGME 589	Research Studio	3rd year standing
IGME-590	Undergraduate Seminar in IGM	Varies
IGME-599	Independent Study	Permission of Instructor

Software Engineering - Undergraduate Program Schedule

- Indicate academic calendar type: _x_Semester ___Quarter ___ Trimester ___Other (describe)

Term: FALL 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI-141Computer Science I (counts as General Education Electives course 1) E-1	4	**X**			
MATH-181 Calculus I (counts as General Education Perspectives Course 7) P-7A	4	**X**			
General Education Perspectives P-1	3	**X**			
General Education Perspectives P-2	3	**X**			
SWEN-101 Freshman Seminar	1		**X**		
ACSC-010 Year One	0				
Term credit total:	15	14	1		

Term: SPRING 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI-142 Computer Science II (counts as General Education Electives course 2) E-2	4	**X**			CSCI-141
MATH-182 Calculus II (counts as General Education Perspectives Course 8) P-7B	4	**X**			MATH-181
MATH-190 Discrete Mathematics for Computing (counts as General Education Electives course 3) E-3	3	**X**			Coreq: MATH-182
SWEN-250 Personal SW Engineering	3		**X**		CSCI-141 with a grade of C- or better or (corequisite: CSCI-140 or CSCI-142 or CSCI-142)
First Year Writing Seminar (F)	3	**X**			
Term credit total:	17	14	3		

Term: FALL2		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
PHYS-211 University Physics I (counts as General Education Perspectives Course 5) P-5	4	**X**			MATH-181
SWEN-220 Mathematical Models of Software (counts as General Education Electives course 4) E-4	3	**X**			MATH-190 and (CSCI-140, CSCI-142 or CSCI-242)
COMM-253 Communication	3	X			
SWEN-261 Intro. to SW Engineering	3		**X**		CSCI-240 or CSCI-142 or CSCI-242
General Education Perspectives P-3	3	**X**			
SWEN-099 SE Co-op Seminar	0		X	X	
Term credit total:	16	13	3		

Term: SPRING 2		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
PHYS-212 University Physics II (counts as General Education Perspectives Course 6) P-6	4	**X**			PHYS-211
STAT-205 Applied Statistics (counts as General Education Electives course 5) E-5	3	**X**			MATH-182
SWEN-256 SW Process & Project Mgt.	3		**X**		SWEN-261
SWEN-262 Eng. of SW Subsystems	3		**X**		SWEN-261, SWEN- 250
General Education Perspectives P-4	3	**X**			
Term credit total:	16	10	6		

Term: FALL/SPRING 3 GLOBAL / CROATIA		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
General Education Immersion I-1	3	**X**			
Free elective 1[7]	3		**X**		

Term: FALL/SPRING 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
SWEN-331 Engineering Secure Software	3		**X**		(SWEN-261 or 4010-361) and (SWEN-499 or SWEN-488 or CSEC-499 or CSCI-499)
SWEN-444 H.C. Reqts & Design	3				SWEN-262 Coreq: STAT-205

Free elective 2[7]	3		X			SWEN-340 Software Design of Computing Systems	3		X		SWEN-250 and SWEN-220MATH
Math/science elective[6] (counts as General Education Electives course 6) E-6	3	X				CSCI-261 Analysis of Algorithms or CSCI-264 Honors Analysis of Algorithms	3	X			MATH-190
General Education Immersion I-2	3	X				General Education Immersion I-3	3	X			
Term credit total:	15	6	9			Term credit total:	15	6	9		
Term: FALL 5		Check course classification (s				**Term: SPRING 5**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
SWEN-561 Software Engineering Project I	3		X		co-op complete[1], SWEN-256, SWEN-444 Coreq: SWEN-440	SWEN-562 Software Engineering Project II	3		X		SWEN-561
Engineering Elective 1[4]	3		X			Engineering Elective 2[4]	3		X		
SWEN Design Elective[2]	3		X		SWEN-262	Professional Elective[5]	3				
SWEN-440 SW Sys. Reqts. & Arch. (WI)	3		X		(SWEN-488 or SWEN-499) Coreq: SWEN-444	SWEN Process Elective[3]	3				SWEN-256
Free elective 3	3					Free elective 4	3				
Term credit total:	15		9			Term credit total:	15		6		
The program requires the student to complete two SWEN-499 and one SWEN-488 or SWEN-498 co-op terms.[1]											
Program Totals:	**Credits: 127**		**Liberal Arts & Sciences: 66**			**Major: 46**			**Elective & Other: 15**		

We count all engineering credits as major credits. This includes 40 credits of software engineering courses and 6 credits of engineering electives which are described below. The 15 credits of Elective & Other courses includes 3 credits of Professional Elective described below, and 12 credits of Free Electives.

The program has 66 credits of General Education courses. The program has prescribed the Natural Science Inquiry (P-5) and Scientific Principles (LAS-P,6) General Education Perspectives as the two-semester sequence of University Physics. The program uses the two-semester sequence of Calculus as the Mathematics (LAS-P,7a and 7b) Perspective courses. The First-Year Elective is specified as a math/science elective. A student is free to choose the courses used to satisfy the other four Perspectives and the three courses for Immersion. ENGL-150 First-Year Writing, COMM-253 Communication, and SWEN-440 Software System Requirements and Architecture, the program-based writing intensive course, satisfy the writing requirement.

[1]A student must complete two SWEN-499 and one SWEN-488 or SWEN-498 terms after passing SWEN-262 (with a grade of C- or better) and COMM-253 prior to enrolling in senior project. We plan to offer all required courses and some design and process electives in both the Fall and Spring semesters. This will allow a student the flexibility to be on co-op either semester during their third and fourth years.

[2]Software Engineering design electives include:

- SWEN-342 Engineering of Concurrent and Distributed Software Systems
- SWEN-343 Engineering of Enterprise Software Systems
- SWEN-344 Engineering of Web Based Software Systems

- SWEN-514 Engineering Cloud Software Systems
- SWEN-563 Real Time and Embedded Systems
- SWEN-564 Modeling of Real Time Systems
- SWEN-565 Performance Engineering of Real Time and Embedded Systems
- SWEN-567 Hardware Software Co-Design for Cryptographic Applications
- SWEN-549 Software Engineering Design Seminar
- SWEN-711 Engineering Self-Adaptive Software Systems
- SWEN-712 Engineering Accessible Systems
- SWEN-745 Software Modeling
- SWEN-746 Model Driven Development
- SWEN-755 Software Architecture
- SWEN-789 Graduate Special Topics (design focused)

[3]Software Engineering process electives include:

- SWEN-350 Software Process and Product Quality
- SWEN-352 Software Testing
- SWEN-356 Trends in Software Development Processes
- SWEN-559 Software Engineering Process Seminar
- SWEN-722 Process Engineering
- SWEN-732 Collaborative Software Development
- SWEN-772 Software Quality Engineering
- SWEN-789 Graduate Special Topics (process focused)

[4]A student can choose Engineering Electives from the following:

- Any software engineering (SWEN) elective course,
- The following set of undergraduate courses offered by Computer Science:
    - CSCI-251 Concepts of Parallel and Distributed Systems
    - CSCI-320 Principles of Data Management
    - CSCI-331 Introduction to Artificial Intelligence
    - CSCI-344 Programming Language Concepts
    - CSCI-351 Data Communications & Networks I
    - CSCI-352 Operating Systems
    - CSCI-420 Principles of Data Mining
    - CSCI-431 Introduction to Computer Vision

    - CSCI-452 Systems Programming
    - CSCI-453 Computer Architecture
    - CSCI-455 Principles of Computer Security
    - CSCI-462 Introduction to Cryptography
    - CSCI-464 Xtreme Theory
    - CSCI-510 Introduction to Computer Graphics
- Any graduate level course offered by Computer Science, *except* the following:
    - CSCI-603 Computational Problem Solving
    - CSCI-605 Advanced Object-Oriented Programming Concepts
- Any course offered through College of Engineering, *except* the following:
    - BIME-182, Intro to Programming for Biomedical Engineering
    - EEEE-346, Advanced Programming
    - EEEE-450, Introduction to Matlab Procedural Programming
    - ISEE-120 Fundamentals of Industrial Engineering
    - ISEE-200 Computing for Engineers
    - MECE-450 Introduction to Matlab Procedural Programming

[5] A Professional Elective is a three-credit course that satisfies the requirements for an Engineering Elective given above, or a Business Elective chosen from the following list:

- ECON-405 International Trade and Finance
- ECON-430 Managerial Economics
- FINC-220 Financial Management
- HRDE-386 Human Resources Development
- MGMT-215 Organizational Behavior
- MGMT-350 Entrepreneurship
- MGMT-420 Managing Innovation and Technology
- DECS-310 Operations Management
- MKTG-230 Principles of Marketing
- INTB-225 Global Business Environment
- BLEG-200 Business Law I

[6]A student can choose Math/Science Electives from the following preapproved list, or request department approval for other course options:

- BIOG-101Explorations in Cellular Biology and Evolution
- BIOG-102Explorations in Animal and Plant Anatomy and Physiology

- BIOL-101General Biology I
- BIOL-102General Biology II
- CHMG-131 General Chemistry for Engineers
- CHMG-141General & Analytical Chemistry I
- CHMG-142General & Analytical Chemistry II
- CSCI-262/263 (Honors) Introduction to Computer Science Theory
- ECON-403 Econometrics I
- ECON-404 Mathematical Methods: Economics
- ENVS-101 Concepts of Environmental Science
- IMGS-111 Imaging Science Fundamentals
- IMGS-112 Astronomical Imaging Fundamentals
- ITDS-280 Designing Scientific Experiments
- MATH-219 Multivariable Calculus
- MATH-231 Differential Equations
- MATH-241 Linear Algebra
- MATH-251 Probability and Statistics I
- MATH-252 Probability and Statistics II
- MATH-351 Graph Theory
- MATH-367 Codes & Ciphers
- MEDG-101Human Biology I)
- MEDG-102Human Biology II)
- PHYS-220 University Astronomy
- PHYS-225 Introduction to Computational Physics
- With department approval, a course that has one of the above courses or a required math or science course in the SE program as a prerequisite and is in one of the following subject areas: BIOG, BIOL, CHEM, CHMA, CHMB, CHMG, CHMI, CHMO, CHMP, ENVS, IMGS, MATH, MEDS, PHYS, STAT

[7]Students are required to complete 12 credits of Free Elective coursework. This is typically completed as **four 3-credit courses**. Students may also combine credits from 1-, 2- or 4-credit courses to reach this total. Free elective credits will not be awarded for:

- Remedial/bridge coursework taken subsequent to related core coursework (e.g., Pre-calculus after taking Calculus).
- A course that covers similar material, or material at a lower level, to another required or elective course (e.g., College Physics and University Physics, introductory programming class and Computer Science I).

Web & Mobile Computing - Undergraduate Program Schedule

- Indicate academic calendar type: _X_Semester ___Quarter ___ Trimester ___Other (describe)

Term: Fall 1		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-120 Comp Prob Solving – Info Domain I	4	X			
ISTE-190 Found of Modern Info Processing	3	X			
ISTE-140 Web & Mobile I	3		X		
MATH-131 Discrete Mathematics (P-7A)	4	X			
NMDE-111 New Media Design Digital Survey I	3		X	X	
Year One	0				
Term credit total:	17	11	6		

Term: Spring 1		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-121 Comp Prob Solving–Info Domain II	4	X			ISTE-120
Liberal Arts and Sciences Elective	3	X			
ISTE-230 Intro to Database & Data Modeling	3		X		ISTE-120
First Year Writing	3	X			
Liberal Arts and Sciences (P-1, Ethical)	3	X			
Wellness Activity	0				
Term credit total:	16	13	3		

Term: Fall 2		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
ISTE-240 Web & Mobile II	3		X		ISTE-140, ISTE-120
ISTE-260 Designing the User Experience	3		X		ISTE-140
NSSA-290 Networking Essen for Developers	3		X		ISTE-121
MATH-161 Applied Calculus (P-7B)	4	X			
Liberal Arts and Sciences (P-2, Artistic)	3	X			
Wellness Activity	0				
Term credit total:	16	7	9		

Term: Spring 2		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
SWEN-383 Software Design Principles and Patterns	3		X		ISTE-230, ISTE-121
ISTE-340 Client Programming	3		X		ISTE-121, ISTE-240
ISTE-330 Database Connectivity and Access	3		X		ISTE-230
ISTE-252 Foundations of Mobile Design	3		X		ISTE-240
Liberal Arts and Sciences (P-3, Global)	3	X			
ISTE-099 Second Year Seminar	0				
Term credit total:	15	3	12		

Coop 1 (After Sophomore year)

Term: Fall 3 GLOBAL / CROATIA		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
Free Elective 3	3		X		
ISTE-341 Server Programming	3		X		ISTE-230, ISTE-340 SWEN-383
Liberal Arts and Sciences (P-4, Social)	3	X			
Free Elective 1	3				
Free Elective 2	3				
Term credit total:	15	3	6		

Term: Spring 3		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
WMC Concentration Course 1	3		X		
ISTE-422 App Development Practices	3		X		ISTE-121
Liberal Arts and Sciences (P-5, Natural Science Inquiry)	4	X			
Liberal Arts and Sciences (I-1)	3	X			
WMC Concentration Course 1	3				
Term credit total:	16	7	6		

Coop 2 (Before Senior year)

Term: Fall 4	Check course classification (s)

Term: Spring 4	Check course classification (s)

Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
WMD Concentration Course 3	3		X		
ISTE-500 Senior Development Project I	3		X		co-op requirement
Liberal Arts and Sciences (P-6, Scientific Principles)	4	X			
Liberal Arts and Sciences (I-2)	3	X			
Free Elective 4	3				
Term credit total:	16	7	6		

Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
WMC Concentration Course 4	3		X		
ISTE-501 Senior Development Project II (writing intensive)	3		X		ISTE-500
Liberal Arts and Sciences Elective (writing intensive)	3	X			
Liberal Arts and Sciences (I-3)	3	X			
Liberal Arts and Sciences Elective	3	X			
Term credit total:	15	9	6		

Program Totals:	Credits: 126	Liberal Arts & Sciences: 60	Major: 54	Elective & Other: 12

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course **Prerequisite(s):** list prerequisite(s) for the noted courses

Liberal Arts & Sciences Courses

The Liberal Arts & Sciences courses listed as 4(3) credits above can be either 3 or 4 credits, as long as the student has a total of 60 LAS credits at graduation.. Taking a 4 credit P-5, P-6, P7A and P-7B are preferred, but not required.

Concentrations

Students matriculated in this degree will select two two-course concentration representing twelve semester hours of work (six each). Concentrations and corresponding courses are listed below.

Web Application Development

GCCIS-ISTE-442 Secure Web Application Development
GCCIS-ISTE-444 Web Server Development and Administration

Mobile Application Development

GCCIS-ISTE-454 Mobile Application Development I
GCCIS-ISTE-456 Mobile Application Development II

Wearable & Ubiquitous Development

GCCIS-ISTE-358 Foundations of Wearable and Ubiquitous Computing
GCCIS-ISTE-458 Advanced Topics in Wearable and Ubiquitous Computing

Project Life Cycle

GCCIS-NSSA-370 Project Management
GCCIS-ISTE-430 Information Requirements Modeling

Database (take 2 of the 3)

GCCIS-ISTE-432 Database Application Development
GCCIS-ISTE-438 Contemporary Databases
GCCIS-ISTE-470 Data Mining and Exploration

Special Topics

A two course, six-semester hour special topics concentration is available to selected students who wish to pursue an in-depth study of an area not present in the program's concentration offerings. The student will develop a special concentration proposal with the faculty advisor. The head of the academic unit will review the proposal and will approve or deny the request. Only one special topics concentration will be allowed to any given student.