Viewing: BS-CS-1/MS-CS-1 : Bachelor of Science in Computer Science/Master of Science in Computer Science

Last approved: 11/28/17 10:21 am

Last edit: 05/02/18 9:46 pm

Changes proposed by: agam

						500
Requestor	Name	Gady Agan	<mark>Sarah Pariseau</mark>	E-mail	agam@iit.edu sparisea@iit.edu	Vot
Origination Date	2018-5-2 2 4	017-11-28				6. Un
ls this an	No					Stu
interdisciplinary	NO					Chi Z Chi
program?						7. Gra
program						8 Gr:
	Commutan	Calabaa		Callaga		Co
	Computer	Science		College		9. Gra
college of Science						Co
Program Title	Bachelor o	f Science in (Computer Science/M	aster of Science i	n	10. Fac
	Computer	Science				Ch
Effective Academic	2018 - 2019	9	Effective Term	Fall 2018		11. Aca
Year						12. Reg
Academic Level	Undergrad	uate				
Program Type	Co-Termina	al Degree				Аррі
	Pachalor	f Science/Ma	stor of Science(PSM	5)		1.05/
Degree Type	Dachelor 0			5)		Eur
CIP Code	11.0701 - C	Computer Sci	ence.			(es
			2			Ар
is there more than or	ie Academic	Unit propose	er?			Ch
	No					2.05/
Second CIP	11.0701 - 0	Computer Sci	ence.			Sdi (sn
						Ap
Program Code	BS-CS-1/M	S-CS-1				Aca
Due que re Attuile ute						3.05/
Program Attribute						Xia
Total Program	150					Ар
Credit Hours						De

Program Narrative and Justification

History

- 1. Nov 28, 2017 by Sarah Pariseau (sparisea)
- 2. Nov 28, 2017 by Sarah Pariseau (sparisea)

Narrative description of how the institution determined the need for the program. For example, describe what need this program will address and how the institution became aware of that need. If the program is replacing a current program(s), identify the current program(s) that is being replaced by the new program(s) and provide details describing the benefits of the new program(s). If the program will be offered in connection with, or in response to, an initative by a governmental entity, provide details of that initiative.

In Workflow

- 1. CSCI Chair
- 2. Academic Affairs
- 3. SI Dean
- 4. Undergraduate **Studies Committee** Chair
- 5. Undergraduate **Studies Committee** te
- dergraduate udies Committee air
- aduate Studies mmittee Chair
- aduate Studies mmittee Vote
- aduate Studies mmittee Chair
- culty Council air
- ademic Affairs
- gistrar

roval Path

- /02/18 10:02 pm nice Santos santos2): proved for CSCI air
- /03/18 8:02 am rah Pariseau arisea): proved for
- ademic Affairs /03/18 4:43 pm aofan Li (lix): proved for SI
 - an

Narrative description of how the program was designed to meet local market needs, or for an online program, regional or national market needs. For example, indicate if Bureau of Labor Statistics data or State labor data systems information was used, and/or if State, regional, or local workforce agencies were consulted. Include how the course content, program length, academic level, admission requirements, and prerequisites were decided; including information received from potential employers about course content; and information regarding the target students and employers.

Narrative description of any wage analysis the institution may have performed, including any consideration of Bureau of Labor Statistics wage data related to the new program.

Narrative description of how the program was reviewed or approved by, or developed in conjunction with, one or more of the following: a) business advisory committees; b) program integrity boards; c) public or private oversight or regulatory agencies (not including the state licensing/authorization agency and accrediting agency); and d) businesses that would likely employ graduates of the program. For example, describe the steps taken to develop the program, identify when and with whom discussions were held, provide relevant details of any proposals or correspondence generated, and/or describe any process used to evaluate the program.

What are the enrollment estimates?

Year	1

Year 2

Year 3

Attach Additional Program Justification Document(s)

Academic Information

Advising

Since quality advising is a key component of good retention, graduation, and career placement, how will students be mentored? What student professional organizations will be formed? How will the department work with the Career Services office to develop industry connections?

Program Resources

Which program resources are necessary to offer this program?

Proposed Bulletin Entry

Admission Requirements

Course Requirements

Required Courses

Code **Credit Hours** Title **Computer Science Requirements** (36) <u>CS 100</u> Intro to the Profession 2 CS 115 **Object-Oriented Programming I** 2 CS 116 **Object-Oriented Programming II 1** 2 CS 330 **Discrete Structures** 3 CS 331 Data Structures and Algorithms 3 CS 350 Cmptr Org&Asmbly Lang Prgmmg 3

Course List

Code	Title	Credit Hours
<u>CS 351</u>	Systems Programming	3
<u>CS 425</u>	Database Organization	3
<u>CS 430</u>	Introduction to Algorithms	3
<u>CS 440</u>	Prgmng Languages Translators	3
<u>CS 450</u>	Operating Systems	3
<u>CS 485</u>	Computers and Society	3
<u>CS 487</u>	Software Engineering	3
Computer Science Electives		(12)
Select 12 credit hours 2		12
Graduate Core Courses		(12)
Select one programming core co	urse:	3
CS 511	Topics in Computer Graphics	3
 CS 512	Computer Vision	3
<u> </u>	Advanced Database Organization	3
<u>CS 540</u>	Syntactic Anlys of Prom Lang	3
CS 541	Tonics in Comple Construction	3
<u>CS 546</u>	Parallel and Distributed Proc	3
<u>CS 551</u>	Operating Syst Design& Implement	3
<u>CS 551</u> CS EE2	Cloud Computing	2
Coloct one systems sore source:	cloud computing	2
Select one systems core course.		2
<u>CS 542</u>	Computer Netwick II. Netwick Sug	2
<u>CS 544</u>	Computer Nuwrks II: Nuwrk SVC	3
<u>CS 547</u>	wireless Networking	3
<u>CS 550</u>	Advanced Operating Systems	3
<u>CS 555</u>	Anlyte Mdis Simul Comp Syst	3
<u>CS 570</u>	Adv Computer Architecture	3
<u>CS 586</u>	Software Systems Arch	3
Select two theory core courses:		6
<u>CS 530</u>	Theory of Computation	3
<u>CS 533</u>	Computational Geometry	3
<u>CS 535</u>	Dsgn and Anlys of Algorithms	3
<u>CS 536</u>	Science of Programming	3
<u>CS 538</u>	Combinatorial Optimization	3
<u>CS 539</u>	Game Theory: Algorithms & Apps	3
Graduate Electives		(11)
Select 11 credit hours from the fe	ollowing:	11
<u>CS 591</u>	Reseach and Thesis M.S.	0-5
<u>CS 597</u>	Reading and Special Problems	0-5
400- or 500-level CS courses		0-11
Mathematics Requirements		(20)
<u>MATH 151</u>	Calculus I	5
<u>MATH 152</u>	Calculus II	5
<u>MATH 251</u>	Multivariate & Vector Calculus	4
<u>MATH 332</u>	Elementary Linear Algebra	3
or <u>MATH 333</u>	Matrix Alg & Complex Variables	
<u>MATH 474</u>	Probability and Statistics	3
or <u>MATH 475</u>	Probability	
Mathematics Elective		(3)
Select one of the following:		3
MATH 252	Introduction to Diff Equations	4
MATH 350	Intro to Computational Mathe	3
MATH 410	Number Theory	3
MATH 435	Linear Optimization	3
MATH 453	Combinatorics	3
MATH 454	Graph Theory and Applications	3
MATH 476	Statistics	3
MATH 481	Intro to Stochastic Processes	3
Science Requirements		(8)
PHYS 123	General Physics I: Mechanics	4
	deneral mysics i mechanics	

Code	Title	Credit Hours
<u>PHYS 221</u>	Gen Physics II: Elect&Magntism	4
Science Electives		(6)
Select six credit hours 3		6
Communication Elective		(3)
Select one of the following:		3
<u>COM 421</u>	Technical Communication	3
<u>COM 424</u>	Document Design	3
<u>COM 425</u>	Editing	3
<u>COM 428</u>	Verbal Visual Communications	3
<u>COM 435</u>	Intercultural Communication	3
Interprofessional Projects (I	PRO)	(6)
See IIT Core Curriculum, sec	<u>tion E</u>	6
Humanities and Social Sciences Requirements		(21)
See IIT Core Curriculum, sec	21	
Free Electives		(12)
Select 12 credit hours		12
Total Credit Hours		150
		-

 $1 \frac{\text{CS 201}}{\text{IS a one-semester}}$, accelerated course equivalent to the two-semester $\frac{\text{CS 115}}{\text{CS 116}}$ sequence.

2Computer science electives: Any computer science course at the 300-level or higher (including graduate CS courses) may be used as a computer science elective, except <u>CS 401</u> and <u>CS 402</u>. <u>ECE 218</u> and <u>ECE 441</u> may also be used as computer science electives. Higher mathematics or computational science courses at the 300-level or above can also be used as computer science electives, with CS department approval.

3Science electives (no lab required): Chosen from the natural sciences (biology, chemistry, material science, and physics), or courses marked with an (N) (natural science attribute) in the Undergraduate Bulletin. At least one course must be in a field other than physics.

Sample Curriculum/Program Requirements

Bachelor of Science in Computer Science/Master of Science in Computer Science Curriculum

			Year 1	
Semester 1	Credit	HoursSemester 2	Credit Hours	
<u>CS 100</u>	2	<u>CS 116</u> 1	2	
<u>CS 115</u> 1	2	<u>MATH 152</u>	5	
<u>MATH 151</u>	5	<u>PHYS 123</u>	4	
Humanities 200-level Course	3	Humanities Elective (300+)	3	
Social Sciences Elective	3	Social Sciences Elective (300+)	3	
	15		17	
			Year 2	
Semester 1	Credit	HoursSemester 2	Credit Hours	
<u>CS 330</u>	3	<u>CS 350</u>	3	
<u>CS 331</u>	3	<u>CS 425</u>	3	
<u>MATH 251</u>	4	<u>MATH 332</u> or <u>333</u>	3	
PHYS 221	4	Humanities Elective (300+)	3	
Social Sciences Elective (300+)	3	Science Elective2	3	
	17		15	
			Year 3	
Semester 1	Credit	HoursSemester 2	Credit Hours	
<u>CS 351</u>	3	<u>CS 430</u>	3	
<u>CS 440</u>	3	<u>CS 450</u>	3	
<u>MATH 474</u> or <u>475</u>	3	IPRO Elective I	3	
Communication Elective3	3	Mathematics Elective	3	
Computer Science Elective4	3	Free Elective	3	
	15		15	
			Year 4	
Semester 1	Credit	HoursSemester 2	Credit Hours	

<u>CS 487</u>	3	<u>CS 485</u>	3
IPRO Elective II	3	Computer Science Elective4	3
Computer Science Elective4	3	Computer Science Elective4	3
Science Elective2	3	Free Elective	3
Humanities or Social Sciences Elective	3	Free Elective	3
Free Elective	3		
	18		15
			Year 5
Semester 1	Credit	HoursSemester 2	Credit Hours
Graduate Core Course	3	Graduate Core Course	3
Graduate Core Course Graduate Core Course	3	Graduate Core Course Graduate Core Course	3 3
Graduate Core Course Graduate Core Course Graduate Elective Course	3 3 3	Graduate Core Course Graduate Core Course Graduate Elective Course	3 3 3
Graduate Core Course Graduate Core Course Graduate Elective Course Graduate Elective Course	3 3 3 3	Graduate Core Course Graduate Core Course Graduate Elective Course Graduate Elective Course	3 3 3 2

Total Credit Hours: 150

1 CS 201 is a one-semester, accelerated course equivalent to the two-semester CS 115/CS 116 sequence.

2Science electives (no lab required): Chosen from the natural sciences (biology, chemistry, material science, and physics), or courses marked with an (N) (natural science attribute) in the Undergraduate Bulletin. At least one course must be in a field other than physics.

3Communication elective must be COM 421, COM 424, COM 425, COM 428, or COM 435.

4Computer science electives: Any computer science course at the 300-level or higher (including graduate CS courses) may be used as a computer science elective, except <u>CS 401</u> and <u>CS 402</u>. <u>ECE 218</u> and <u>ECE 441</u> may also be used as computer science electives. Higher mathematics or computational science courses at the 300-level or above can also be used as computer science electives, with CS department approval.

Specialization Requirements

Data Science

A minimum of four courses are required for this specialization.

	Course List	
Code	Title	Credit Hours
<u>BUS 371</u>	Strategies for New Markets	3
<u>CS 422</u>	Data Mining	3
or <u>CS 584</u>	Machine Learning	
<u>CS 451</u>	Parallel/Distributed Computing	3
<u>MATH 481</u>	Intro to Stochastic Processes	3
or <u>MATH 483</u>	Design and Analysis of Exprmnt	

Note: MATH 481 has prerequisites of MATH 332 or MATH 333 and MATH 475; MATH 483 has a prerequisite of MATH 476.

Distributed and Cloud Computing

A minimum of four courses are required for this specialization.

Course List	
Title	Credit Hours
Mobile Application Development	3
Distributed Objects	
Parallel/Distributed Computing	3
Data Communication	3
Cloud Computing	3
	Course List Title Mobile Application Development Distributed Objects Parallel/Distributed Computing Data Communication Cloud Computing

Information and Knowledge Management Systems

A minimum of four courses are required for this specialization.

Course List

Code	Title	Credit Hours
<u>CS 425</u>	Database Organization	3
<u>CS 482</u>	Infor Knwldg Mgmt Syst	3
Select a minimum of two cou	urses from the following:	6
<u>CS 422</u>	Data Mining	3

Code	Title
<u>CS 429</u>	Information Retrieval
<u>CS 481</u>	Intllgnc Txt Analys Knwldg Mgm
<u>CS 585</u>	Natural Language Processing

Information Security

A minimum of four courses are required for this specialization.

	Course List		
Code	Title	Credit Hours	
<u>CS 425</u>	Database Organization	3	
<u>CS 458</u>	Intro to Information Security	3	
<u>CS 455</u>	Data Communication	3	
<u>CS 549</u>	Cryptography	3	
or <u>CS 558</u>	Advanced Computer Security		

Program Outcomes and Assessment Process

What are the learning goals for this program?				
In what semesters will the data be collected to assess this learning goal, and by whom?				
Provide the name of the rubric that will be used to assess the extent to which students are achieving this learning goal.				
How often and by whom will the data be analyzed? What benchmarks or targets will be used to interpret your results?				
Briefly describe the process that will be used to share the results with faculty and use these to motivate program improvement.				
Attach Additional Assessment Document(s)				
Co-Terminal	Degree Requi	rements		

Undergraduate Degree Requirements

Minimum credit hours	150
Specialization required?	Optional
Notes about specialization requirement	
Minor required?	No
Required minimum GPA for admission	3.25 3.00
Number of shared credit hours allowed.	9
Which courses may be shared?	

CS 400- or 500-level electives

Proposed General Curriculum

Degree credit hours 127 required Specialization credit 12 hour requirement List Major Course Requirements List Mathematics Requirements List Science Requirements List Computer Science Requirements List Humanities and Social Sciences Requirements List Interprofessional Project (IPRO) Requirements List Technical Elective Course Options List Free Elective 12 Credit Hours (if applicable) Semester-bysemester plan of study for the degree program

Master of Science (M.S.) Degree

Minimum credit hours	150								
400-level credit hour li	mit?	Yes		How many	hours allowe	ed?	12		
500-600-level credit ho	our limits:		Minimum:	20	Maximum:	32			
700-level credit hour n	naximum:	0							
Thesis required?	Optional								
List specific details about the thesis option	Elective credit hours can include up to five credit hours of master's thesis work (CS 591). With adviser approval, up to three additional credit hours of CS 591 may be added. A student must successfully defend a thesis to apply CS 591 credit hours toward a degree. Students who complete both a project and a thesis can apply a maximum combined total of eight credit hours of CS 591 and CS 597 toward the degree.								
By what method is the thesis defended?	Thesis Defe	nse							
Research course credit	hours	Minimum	6	Maximum	8				
Project course required?	Optional								
List specific details about the project option	Elective credit hours can include up to five credit hours of master's project work (CS 597). A master's project comprises a high-quality paper submitted for publication as an article or as a technical report, or a high- quality piece of software. The software should be of distribution quality, but can be proprietary.								
Project report/ review required?	Optional								
Project course credit h	ours	Minimum	0	Maximum	5	Cours	e Number	597	
Seminar/Colloquium required?	Not Require	ed							
Required Specialization?	No								
List Core Course Requirements									
List Elective Course Options									

Specialization

Report to Faculty Council	
Reviewer Comments	Sarah Pariseau (sparisea) (05/03/18 8:01 am): Increasing admission requirement to 3.25 GPA.

Key: 414