

Date Submitted: 05/02/18 9:46 pm

# 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

Requestor	Name	<b>Gady Agam</b> <del>Sarah Pariseau</del>	E-mail	<b>agam@iit.edu</b> <del>sparisea@iit.edu</del>
Origination Date	<b>2018-5-2</b> <del>2017-11-28</del>			
Is this an interdisciplinary program?	No			
Academic Unit	Computer Science	College		
College of Science				
Program Title	Bachelor of Science in Computer Science/Master of Science in Computer Science			
Effective Academic Year	<b>2018 - 2019</b>	Effective Term	Fall 2018	
Academic Level	Undergraduate			
Program Type	Co-Terminal Degree			
Degree Type	Bachelor of Science/Master of Science(BSMS)			
CIP Code	11.0701 - Computer Science.			
Is there more than one Academic Unit proposer?	No			
Second CIP	11.0701 - Computer Science.			
Program Code	BS-CS-1/MS-CS-1			
Program Attribute				
Total Program Credit Hours	150			

## In Workflow

1. CSCI Chair
2. Academic Affairs
3. SI Dean
4. Undergraduate Studies Committee Chair
5. Undergraduate Studies Committee Vote
6. Undergraduate Studies Committee Chair
7. Graduate Studies Committee Chair
8. Graduate Studies Committee Vote
9. Graduate Studies Committee Chair
10. Faculty Council Chair
11. Academic Affairs
12. Registrar

## Approval Path

1. 05/02/18 10:02 pm Eunice Santos (esantos2): Approved for CSCI Chair
2. 05/03/18 8:02 am Sarah Pariseau (sparisea): Approved for Academic Affairs
3. 05/03/18 4:43 pm Xiaofan Li (lix): Approved for SI Dean

## 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 initiative by a governmental entity, provide details of that initiative.



Code	Title	Credit Hours
<a href="#">CS 351</a>	Systems Programming	3
<a href="#">CS 425</a>	Database Organization	3
<a href="#">CS 430</a>	Introduction to Algorithms	3
<a href="#">CS 440</a>	Prgmng Languages Translators	3
<a href="#">CS 450</a>	Operating Systems	3
<a href="#">CS 485</a>	Computers and Society	3
<a href="#">CS 487</a>	Software Engineering	3
Computer Science Electives		(12)
Select 12 credit hours 2		12
Graduate Core Courses		(12)
Select one programming core course:		3
<a href="#">CS 511</a>	Topics in Computer Graphics	3
<a href="#">CS 512</a>	Computer Vision	3
<a href="#">CS 525</a>	Advanced Database Organization	3
<a href="#">CS 540</a>	Syntactic Anlys of Prgm Lang	3
<a href="#">CS 541</a>	Topics in Complr Constrctn	3
<a href="#">CS 546</a>	Parallel and Distributed Proc	3
<a href="#">CS 551</a>	Operating Syst Design&Implemntn	3
<a href="#">CS 553</a>	Cloud Computing	3
Select one systems core course:		3
<a href="#">CS 542</a>	Computer Netwrks I:Fundamentls	3
<a href="#">CS 544</a>	Computer Ntwrks II: Ntwrk Svc	3
<a href="#">CS 547</a>	Wireless Networking	3
<a href="#">CS 550</a>	Advanced Operating Systems	3
<a href="#">CS 555</a>	Anlytc Mdls Simul Comp Syst	3
<a href="#">CS 570</a>	Adv Computer Architecture	3
<a href="#">CS 586</a>	Software Systems Arch	3
Select two theory core courses:		6
<a href="#">CS 530</a>	Theory of Computation	3
<a href="#">CS 533</a>	Computational Geometry	3
<a href="#">CS 535</a>	Dsgn and Anlys of Algorithms	3
<a href="#">CS 536</a>	Science of Programming	3
<a href="#">CS 538</a>	Combinatorial Optimization	3
<a href="#">CS 539</a>	Game Theory: Algorithms & Apps	3
Graduate Electives		(11)
Select 11 credit hours from the following:		11
<a href="#">CS 591</a>	Reseach and Thesis M.S.	0-5
<a href="#">CS 597</a>	Reading and Special Problems	0-5
400- or 500-level CS courses		0-11
Mathematics Requirements		(20)
<a href="#">MATH 151</a>	Calculus I	5
<a href="#">MATH 152</a>	Calculus II	5
<a href="#">MATH 251</a>	Multivariate & Vector Calculus	4
<a href="#">MATH 332</a>	Elementary Linear Algebra	3
or <a href="#">MATH 333</a>	Matrix Alg & Complex Variables	3
<a href="#">MATH 474</a>	Probability and Statistics	3
or <a href="#">MATH 475</a>	Probability	3
Mathematics Elective		(3)
Select one of the following:		3
<a href="#">MATH 252</a>	Introduction to Diff Equations	4
<a href="#">MATH 350</a>	Intro to Computational Mathe	3
<a href="#">MATH 410</a>	Number Theory	3
<a href="#">MATH 435</a>	Linear Optimization	3
<a href="#">MATH 453</a>	Combinatorics	3
<a href="#">MATH 454</a>	Graph Theory and Applications	3
<a href="#">MATH 476</a>	Statistics	3
<a href="#">MATH 481</a>	Intro to Stochastic Processes	3
Science Requirements		(8)
<a href="#">PHYS 123</a>	General Physics I: Mechanics	4

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

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

2 Computer 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 [CS 401](#) and [CS 402](#). [ECE 218](#) and [ECE 441](#) 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.

3 Science 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

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

<a href="#">CS 487</a>	3	<a href="#">CS 485</a>	3
I PRO 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 Hours	Semester 2	Credit Hours
Graduate Core Course	3	Graduate Core Course	3
Graduate Core Course	3	Graduate Core Course	3
Graduate Elective Course	3	Graduate Elective Course	3
Graduate Elective Course	3	Graduate Elective Course	2
	12		11

Total Credit Hours: 150

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

2 Science 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.

3 Communication elective must be [COM 421](#), [COM 424](#), [COM 425](#), [COM 428](#), or [COM 435](#).

4 Computer 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 [CS 401](#) and [CS 402](#). [ECE 218](#) and [ECE 441](#) 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
<a href="#">BUS 371</a>	Strategies for New Markets	3
<a href="#">CS 422</a>	Data Mining	3
or <a href="#">CS 584</a>	Machine Learning	
<a href="#">CS 451</a>	Parallel/Distributed Computing	3
<a href="#">MATH 481</a>	Intro to Stochastic Processes	3
or <a href="#">MATH 483</a>	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		
Code	Title	Credit Hours
<a href="#">CS 442</a>	Mobile Application Development	3
or <a href="#">CS 447</a>	Distributed Objects	
<a href="#">CS 451</a>	Parallel/Distributed Computing	3
<a href="#">CS 455</a>	Data Communication	3
<a href="#">CS 553</a>	Cloud Computing	3

## Information and Knowledge Management Systems

A minimum of four courses are required for this specialization.

Course List		
Code	Title	Credit Hours
<a href="#">CS 425</a>	Database Organization	3
<a href="#">CS 482</a>	Infor Knwldg Mgmt Syst	3
Select a minimum of two courses from the following:		6
<a href="#">CS 422</a>	Data Mining	3

Code	Title	Credit Hours
<a href="#">CS 429</a>	Information Retrieval	3
<a href="#">CS 481</a>	Intllgnc Txt Analys Knwldg Mgm	3
<a href="#">CS 585</a>	Natural Language Processing	3

## Information Security

A minimum of four courses are required for this specialization.

Code	Title	Credit Hours
<a href="#">CS 425</a>	Database Organization	3
<a href="#">CS 458</a>	Intro to Information Security	3
<a href="#">CS 455</a>	Data Communication	3
<a href="#">CS 549</a>	Cryptography	3
or <a href="#">CS 558</a>	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 Requirements

### Undergraduate Degree Requirements

Minimum credit hours	150
Specialization required?	Optional
Notes about specialization requirement	
Minor required?	No
Required minimum GPA for admission	<b>3.25</b> <del>3.00</del>
Number of shared credit hours allowed.	9
Which courses may be shared?	
CS 400- or 500-level electives	

### **Proposed General Curriculum**

---

Degree credit hours required 127

Specialization credit hour requirement 12

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 Credit Hours (if applicable) 12

Semester-by-semester plan of study for the degree program

## Master of Science (M.S.) Degree

---

Minimum credit hours 150

400-level credit hour limit? Yes How many hours allowed? 12

500-600-level credit hour limits: Minimum: 20 Maximum: **32**

700-level credit hour maximum: **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 Defense

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 hours Minimum 0 Maximum 5 Course Number 597

Seminar/Colloquium required? Not Required

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.