

Computer Science

1. University Requirements: (20)

Writing, Rhetoric and American Cultures (WRA)	4
Integrative Studies in Humanities (IAH)	8
IAH 201-210 and IAH 211 or >	
Integrative Studies in Social Sciences (ISS)	8
ISS 2XX and ISS 3XX	
Bioscience (See 3A Below)	

2. College Requirements: (25)

*CSE 231 Introduction to Programming I	4
*EGR 100 Introduction to Engineering Design	2
*MTH 132 Calculus I	3
*MTH 133 Calculus II	4
MTH 234 Multivariable Calculus	4
*PHY 183 Physics for Scientists & Engineers I	4
PHY 184 Physics for Scientists & Engineers II	4
<i>*College Admission Requirement</i>	

3. Major Requirements: (65-67)

a. Bioscience: (4-6)

Select one course from Group 1 and one course from Group 2.

Group 1

**BS 161 Cell and Molecular Biology	3
ENT 205 Pests, Society & Environment	3
IBIO 150 Integrating Biology: From DNA to Populations	3
MMG 141 Introductory Human Genetics	3
MMG 201 Fundamentals of Microbiology	3
PLB 105 Plant Biology	3
PSL 250 Introductory Physiology	4

Group 2

BS 171 Cell and Molecular Biology Laboratory	2
**CEM 161 Chemistry Laboratory I	1
CEM 162 Chemistry Laboratory II	1
PHY 191 Physics Laboratory for Scientists I	1
PHY 192 Physics Laboratory for Scientists II	1
PLB 106 Plant Biology Laboratory	1

b. Complete all of the following: (32)

CSE 232 Introduction to Programming II	4
CSE 260 Discrete Structures in Computer Science	4
CSE 300 Social, Ethical, & Professional Issues in Computer Science	1
CSE 320 Computer Organization and Architecture	3
CSE 331 Algorithms and Data Structures	3
CSE 325 Computer Systems	3
CSE 335 Object-Oriented Software Design	4
CSE 498 Collaborative Design (W)	4
MTH 314 Matrix Algebra with Computational Applications	3
STT 351 Probability and Statistics for Engineering	3

***These courses may have prerequisites, which are not otherwise required in the program. Students should check course descriptions to ensure they are aware of prerequisites.*

c. Select five of the following courses: (15)

CSE 402 Biometrics and Pattern Recognition	3
CSE 404 Intro to Machine Learning	3
CSE 410 Operating Systems	3
CSE 415 Parallel Programming	3
CSE 420 Computer Architecture	3
CSE 422 Computer Networks	3
CSE 425 Introduction to Computer Security	3
CSE 431 Algorithm Engineering	3
CSE 435 Software Engineering	3
CSE 440 Introduction to Artificial Intelligence	3
CSE 450 Translation of Programming Languages	3
CSE 460 Computability & Formal Language Theory	3
CSE 471 Media Processing & Multimedia Computing	3
CSE 472 Computer Graphics	3
CSE 476 Mobile Application Development	3
CSE 477 Web Application Architecture & Development	3
CSE 480 Database Systems	3
CSE 482 Big Data Analysis	3
CSE 491 Selected Topics in Computer Science	1-4
MTH 451 Numerical Analysis I	3

Required Cognate: (15)

Cognates in the following areas are available to students in Computer Science: business, communication arts and sciences, foreign language, mathematics, the natural sciences, philosophy, psychology, the social sciences, and telecommunication. Students may complete cognates in other areas with the approval of the Department of Computer Science and Engineering academic advisor. The cognate should enhance the student's ability to apply analytical procedures in a specific subject area.

The cognate is selected from (1), (2) or (3) below. The academic advisor of the Department of Computer Science and Engineering must pre-approve both the cognate and the cognate courses.

Cognate 1

A minimum of four courses totaling 15 or more credits outside the College of Engineering. At least 6 of the 15 credits must be in courses at the 300-400 level.

Cognate 2

Cognate in The Eli Broad College of Business consisting of this specific set of courses: ACC 230, (EC 201 or EC 202), FI 320, GBL 323 and MKT 327.

Cognate 3

A sequence of at least four courses in a foreign language.

Other Electives (Variable)

Total Credits Required for Degree

120

The requirements listed above apply to students admitted to the major of Computer Science in the Department of Computer Science and Engineering beginning Fall 2020. The Department of Computer Science and Engineering (CSE) constantly reviews program requirements and reserves the right to make changes as necessary. Consequently, each student is strongly encouraged to consult with their advisor to obtain assistance in planning an appropriate schedule of courses. Students who have questions about Computer Science should contact a CSE advisor. To find out who your advisor is please visit: <https://www.egr.msu.edu/academics/undergraduate/advisors>

Computer Science

Sample Program

Freshman Year				Sophomore Year			
Fall	Credits	Spring	Credits	Fall	Credits	Spring	Credits
Elect/Cognate	4	CSE 231	4	CSE 232	4	CSE 335	4
EGR 100	2	Elect/Cog	3	CSE 260	4	CSE 320	3
MTH 132	3	MTH 133	4	PHY 183	4	CSE 300	1
ISS 2XX	4	WRA 101	4	IAH 201-210	4	MTH 234	4
						PHY 184	4
Total	13	Total	15	Total	16	Total	16

Junior Year				Senior Year			
Fall	Credits	Spring	Credits	Fall	Credits	Spring	Credits
CSE 331	3	Biosci/Lab	4	Elect/Cog	3	Elect/Cog	3
CSE 325	3	Elect/Cog	2	Elect/Cog	3	Elect/Cog	3
STT 351	3	CSE 4XX	3	Elect/Cog	3	CSE 4XX	3
MTH 314	3	CSE 4XX	3	CSE 498	4	CSE 4XX	3
IAH 211 or >	4	ISS 3XX	4			CSE 4XX	3
Total	16	Total	16	Total	13	Total	15

Program Educational Objectives

The MSU Computer Science program prepares students in the application of fundamental computing principles and software development skills. This preparation includes the design and implementation of systems that solve complex problems. Our graduates are trained in teamwork, effective communication, professionalism, and ethics. They are inspired to be lifelong learners and technology practitioners.

As a result of this preparation, a graduate of the MSU Computer Science Program will be:

- A thoughtful practitioner, well versed in the theory and practice of computing.
- Successful in a computing-related profession or graduate study.