

# BACHELOR OF SCIENCE IN COMPUTER SCIENCE 4+1 GRADUATE TRACK

Computer Science spans the range from theory through programming to cutting-edge development of computing solutions. Computer Science offers a foundation that permits graduates to adapt to new technologies and new ideas. The work of computer scientists falls into three categories:

- designing and building software
- developing effective ways to solve computing problems, such as storing information in databases, sending data over networks, or providing new approaches to security problems
- devising new and better ways of using computers and addressing particular challenges in areas such as robotics, computer vision, or digital forensics

Like most Computer Science programs, the YSU Computer Science major requires significant mathematical background.

The Computer Science 4+1 program leads to the degree of Master of Computing and Information Systems. The flexibility of the program allows the student many choices.

This degree may be earned in ten semesters if students average 16 hours per semester during the first 4 years and 11 hours semester during the last year.

In addition to completing all general University requirements, students wishing to receive the Bachelor of Science in Computer Science - Graduate Track must complete the following:

COURSE	TITLE	S.H.
<b>FIRST YEAR REQUIREMENT -STUDENT SUCCESS</b>		
YSU 1500	Success Seminar	1-2
or SS 1500	Strong Start Success Seminar	
or HONR 1500	Intro to Honors	
<b>General Education Requirements</b>		
ENGL 1550	Writing 1	3-4
or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
CMST 1545	Communication Foundations	3
MATH 1571	Calculus 1	4
PHIL 2625	Introduction to Professional Ethics	3
Arts and Humanities (1 course)		3
Natural Sciences (2 courses; one course must include a lab)		6-7
Social Science (2 courses)		6
Social and Personal Awareness (2 courses)		6
<b>Major Requirements</b>		
CSIS 2610	Programming and Problem-Solving	3
CSIS 2610L	Programming and Problem-Solving Lab	1
CSIS 3700	Data Structures and Objects	3
CSIS 3700L	Data Structures and Objects Lab	1
CSIS 3701	Advanced Object-oriented Programming	3
CSIS 3740	Computer Organization	4
CSCI 3710	Introduction to Discrete Structures	3
CSCI 4890	Computer Projects	2
ENGL 3743	Introduction to Public, Professional and Technical Writing	3
or INFO 3704	Business Communication	

Select at least 12 additional semester hours from CSCI or CSIS upper division level courses, or STEM 4890. This must include at least 9 s.h. from the following courses:

CSIS 3722: Development of Databases		
CSIS 3723: Networking Concepts and Administration		
CSIS 3755: Information Assurance		
CSCI 3770: Survey of Programming Languages		
CSCI 5840: Theory of Finite Automata		
STEM 4890	STEM Internship	
<b>Dual credit requirements</b> <sup>9 credit hours from the following list of approved courses</sup>		
CSCI 5801	Software Engineering	3
CSCI 5806	Operating Systems	3
CSCI 5870	Data Structures and Algorithms	3
<b>Mathematics Minor</b>		
MATH 1572	Calculus 2	4
MATH 3720	Linear Algebra and Matrix Theory	3
STAT 3743	Probability and Statistics	4
Additional MATH course	<sup>To meet 18 hour minor</sup>	3
Departmental Free Electives	<sup>Any CSIS/INFO/CSCI/CIS courses</sup>	12
Free Electives	<sup>Any courses to meet 120 total hours</sup>	12

**Total Semester Hours 120-123**

## Year 1

Fall	S.H.	
YSU 1500	Success Seminar	1-2
or SS 1500	or Strong Start Success Seminar	
or HONR 1500	or Intro to Honors	
CSIS 2610	Programming and Problem-Solving	3
CSIS 2610L	Programming and Problem-Solving Lab	1
MATH 1571	Calculus 1	4
ENGL 1550	Writing 1	3-4
or ENGL 1549	or Writing 1 with Support	
GER Social Science		3

**Semester Hours 15-17**

## Spring

CSIS 3700	Data Structures and Objects	3
CSIS 3700L	Data Structures and Objects Lab	1
MATH 1572	Calculus 2 (minor)	4
ENGL 1551	Writing 2	3
GER Natural Science + Lab		3-4

**Semester Hours 14-15**

## Year 2

Fall	S.H.	
CSIS 3701	Advanced Object-oriented Programming	3
CSIS 3740	Computer Organization	4
PHIL 2625	Introduction to Professional Ethics (AH)	3
CMST 1545	Communication Foundations	3
GER Arts & Humanities		3

**Semester Hours 16**

## Spring

CSCI 3710	Introduction to Discrete Structures	3
MATH 3720	Linear Algebra and Matrix Theory	3
ENGL 3743	Introduction to Public, Professional and	3
or INFO 3704	Technical Writing or Business Communication	
GER Social Science		3
GER Social & Personal Awareness		3

**Semester Hours 15**

**Year 3****Fall**

CSCI 5801	Software Engineering	3
CSCI/CSIS Upper Division Elective		3
STAT 3743	Probability and Statistics	4
Departmental Free Elective	Any CSIS/INFO/CSCI/CIS courses	3
Free Elective		3
<b>Semester Hours</b>		<b>16</b>

**Spring**

CSCI/CSIS Upper Division Elective		3
CSCI/CSIS Upper Division Elective		3
Math Minor Upper Division Elective		3
GER Natural Science		3
GER Social & Personal Awareness		3
<b>Semester Hours</b>		<b>15</b>

**Year 4****Fall**

CSCI 5870	Data Structures and Algorithms	3
CSCI 4890	Computer Projects	2
Departmental Free Elective	Any CSIS/INFO/CSCI/CIS courses	3
Free Elective		3
Free Elective		3
<b>Semester Hours</b>		<b>14</b>

**Spring**

CSCI 5806	Operating Systems	3
CSCI/CSIS Upper Division Elective or STEM 4890		3
Departmental Free Elective	Any CSIS/INFO/CSCI/CIS courses	3
Departmental Free Elective	Any CSIS/INFO/CSCI/CIS courses	3
Free Elective		3
<b>Semester Hours</b>		<b>15</b>

<b>Total Semester Hours</b>	<b>120-123</b>
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Highly qualified undergraduate students can apply for admission into the combined "4+1" Bachelors/Masters program for the MC&IS in Computer Science.

Request admission into the program after completing 80-85 s.h. from the MC&IS Graduate Coordinator, Alina Lazar, 308 Meshel Hall, (330) 941-3468.

## Learning Outcomes

Computer science students in the BS degree program will:

- be able to analyze, design, implement and test computer programs by using the appropriate data structures and algorithms.
- obtain full-time employment as programmers, systems analysts, computer specialists and in other closely related fields or/and acceptance to graduate programs.
- communicate effectively with written reports and presentations.