

Curriculum for Software and Scientific Applications Concentration

Freshman Year

- ENGR 1020 Connections to Engineering and Technology Credit: 1. ¹
- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- CSC 1310 Data Structures and Algorithms Credit: 4.
- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- Social/Behavioral Sciences Elective Credit 3. 2
- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- HIST 2010 American History I Credit: 3.
- HIST 2020 American History II Credit: 3.

Sophomore Year

- CSC 2310 Object Oriented Programming and Design Credit: 4.
- CSC 2400 Design of Algorithms Credit: 3.
- CSC 2500 Unix Lab Credit: 1.
- CSC 2700 Discrete Structures for Computer Science Credit: 3.
- <u>CSC 2710 Foundations of Computer Science</u> Credit: 3.
- SPCH 2410 Introduction to Speech Communication Credit: 3. or
 - PC 2500 Communicating in the Professions Credit: 3.
- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- MATH 2010 Introduction to Linear Algebra Credit: 3.
- First Science Sequence Credit 8. 3

Junior Year

- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- CSC Upper-Division Elective⁴ Credit 3.
- CSC Elective Credit⁵ 3.
- CSC 4320 Computer Architecture Credit: 3.
- Humanities/Fine Arts Elective Credit 6. ²
- Second Science Credit: 4. ³
- MATH 3070 Statistical Methods I Credit: 3. or
 - MATH 3470 Introductory Probability and Statistics Credit: 3.

Senior Year

- <u>CSC 4100 Operating Systems</u> Credit: 3.
- CSC 4200 Computer Networks Credit: 3.
- CSC 4610 Software Engineering I Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- 4000-level CSC Elective Credit: 3.
- Electives⁵ Credit 9.
- Social/Behavioral Sciences Elective² Credit: 3.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³Take at least one science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The two sequences must be in different disciplines.
- ⁴ Take any additional 3000- or 4000-level CSC course except CSC 4990.
- ⁵ At least three elective hours need to be upper division.

Curriculum for Software and Scientific Applications Concentration

Computer Science

- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- CSC 1310 Data Structures and Algorithms Credit: 4.
- CSC 2310 Object Oriented Programming and Design Credit: 4.
- <u>CSC 2400 Design of Algorithms Credit: 3.</u>
- CSC 2500 Unix Lab Credit: 1.
- CSC 2700 Discrete Structures for Computer Science Credit: 3.
- CSC 2710 Foundations of Computer Science Credit: 3.
- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- CSC 4100 Operating Systems Credit: 3.
- CSC 4200 Computer Networks Credit: 3.
- CSC 4320 Computer Architecture Credit: 3.
- <u>CSC 4610 Software Engineering I</u> Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- CSC Elective Credit⁵ 3.
- CSC Upper-Division Elective⁴ Credit 3.
- 4000-level CSC Elective Credit: 3.

Mathematics

- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- MATH 2010 Introduction to Linear Algebra Credit: 3.
- MATH 3070 Statistical Methods I Credit: 3. or
 - MATH 3470 Introductory Probability and Statistics Credit: 3.

General Education

- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- SPCH 2410 Introduction to Speech Communication Credit: 3. or
 - PC 2500 Communicating in the Professions Credit: 3.
- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- Humanities/Fine Arts Elective Credit 6.²
- Social/Behavioral Sciences Elective Credit 6. ²
- <u>HIST 2010 American History I</u> Credit: 3.
- HIST 2020 American History II Credit: 3.
- First Science Sequence Credit 8. 3

Other

- ENGR 1020 Connections to Engineering and Technology Credit: 1. 1
- Second Science Credit: 4. ³
- Electives⁵ Credit 9.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³Take at least one science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The two sequences must be in different disciplines.
- ⁴ Take any additional 3000- or 4000-level CSC course except CSC 4990.
- ⁵ At least three elective hours need to be upper division.

Curriculum for Cyber-Security Concentration

Freshman Year

- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- Social/Behavioral Sciences Elective Credit 3.²
- HIST 2010 American History I Credit: 3.
- HIST 2020 American History II Credit: 3.
- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- <u>CSC 1310 Data Structures and Algorithms</u> Credit: 4.
- ENGR 1020 Connections to Engineering and Technology Credit: 1. ¹

Sophomore Year

- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- SPCH 2410 Introduction to Speech Communication Credit: 3. or
 - PC 2500 Communicating in the Professions Credit: 3.
- First Science Sequence Credit 8. ³
- CSC 2310 Object Oriented Programming and Design Credit: 4.
- <u>CSC 2400 Design of Algorithms</u> Credit: 3.
- CSC 2500 Unix Lab Credit: 1.
- CSC 2560 Networks for Information Technologists Credit: 3.
- CSC 2700 Discrete Structures for Computer Science Credit: 3.
- CSC 2710 Foundations of Computer Science Credit: 3.
- MATH 2010 Introduction to Linear Algebra Credit: 3.

Junior Year

- Humanities/Fine Arts Elective Credit 6.²
- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- Cyber-Security Elective Credit: 3. ⁴
- CSC 4200 Computer Networks Credit: 3.
- CSC 4320 Computer Architecture Credit: 3.
- Lab Science³ Credit 4.
- MATH 3070 Statistical Methods I Credit: 3. or
 - MATH 3470 Introductory Probability and Statistics Credit: 3.

Senior Year

- Social/Behavioral Sciences Elective Credit: 3.²
- <u>CSC 4100 Operating Systems</u> Credit: 3.
- <u>CSC 4570 IT Security</u> Credit: 3.
- <u>CSC 4575 Information Assurance and Cryptography</u> Credit: 3.
- CSC 4610 Software Engineering I Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- CSC Elective Credit: 3.
- Electives Credit: 3.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³ Take your science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The other science must be in a different discipline.
- ⁴ Select from one of the following: CSC 3220, CSC 4220, CSC 4580, CSC 4760, CSC 4770, DS 4125, or CJ 3640

Curriculum for Cyber-Security Concentration

Computer Science

- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- CSC 1310 Data Structures and Algorithms Credit: 4.
- CSC 2310 Object Oriented Programming and Design Credit: 4.
- <u>CSC 2400 Design of Algorithms Credit: 3.</u>
- CSC 2500 Unix Lab Credit: 1.
- <u>CSC 2700 Discrete Structures for Computer Science</u> Credit: 3.
- CSC 2710 Foundations of Computer Science Credit: 3.
- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- CSC 4100 Operating Systems Credit: 3.
- CSC 4200 Computer Networks Credit: 3.
- CSC 4320 Computer Architecture Credit: 3.
- <u>CSC 4610 Software Engineering I</u> Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- CSC Elective Credit: 3.

Cyber Security

- CSC 2560 Networks for Information Technologists Credit: 3.
- Cyber-Security Elective Credit: 3. 5
- CSC 4570 IT Security Credit: 3.
- <u>CSC 4575 Information Assurance and Cryptography</u> Credit: 3.

Mathematics

- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- MATH 2010 Introduction to Linear Algebra Credit: 3.
- MATH 3070 Statistical Methods I Credit: 3. or
 - MATH 3470 Introductory Probability and Statistics Credit: 3.

General Education

- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- SPCH 2410 Introduction to Speech Communication Credit: 3. or
 - PC 2500 Communicating in the Professions Credit: 3.
- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- Humanities/Fine Arts Elective Credit 6. ²
- Social/Behavioral Sciences Elective Credit 6. ²
- <u>HIST 2010 American History I</u> Credit: 3.
- HIST 2020 American History II Credit: 3.
- First Science Sequence Credit 8. 3

Other

- ENGR 1020 Connections to Engineering and Technology Credit: 1. ¹
- Lab Science³ Credit 4.
- Electives Credit: 3.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³Take your science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The other science must be in a different discipline.
- ⁴ Select from one of the following: CSC 3220, CSC 4220, CSC 4580, CSC 4760, CSC 4770, DS 4125, or CJ 3640

Curriculum for Data Science Concentration

Freshman Year

- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- Social/Behavioral Sciences Elective Credit: 3. (ECON 2010 or ECON 2020 recommended) ²
- HIST 2010 American History I Credit: 3.
- HIST 2020 American History II Credit: 3.
- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- CSC 1310 Data Structures and Algorithms Credit: 4.
- ENGR 1020 Connections to Engineering and Technology Credit: 1. 1

Sophomore Year

- SPCH 2410 Introduction to Speech Communication Credit: 3. or PC 2500 - Communicating in the Professions Credit: 3.
- Science Sequence Credit: 8. ³
- ENGL 2130 Topics in American Literature Credit: 3. or

ENGL 2230 - Topics in British Literature Credit: 3. or

ENGL 2330 - Topics in World Literature Credit: 3.

- <u>CSC 2310 Object Oriented Programming and Design</u> Credit: 4.
- CSC 2400 Design of Algorithms Credit: 3.
- CSC 2500 Unix Lab Credit: 1.
- <u>CSC 2700 Discrete Structures for Computer Science</u> Credit: 3.
- CSC 2710 Foundations of Computer Science Credit: 3.
- MATH 2010 Introduction to Linear Algebra Credit: 3.

Junior Year

- Humanities/Fine Arts Elective Credit: 3.²
- Lab Science Credit: 4.
- MATH 3070 Statistical Methods I Credit: 3. or

MATH 3470 - Introductory Probability and Statistics Credit: 3.

- <u>CSC 3040 Professionalism, Communication and Research in Computing</u> Credit: 3.
- CSC 3220 Fundamentals of Data Science Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- CSC 4320 Computer Architecture Credit: 3.
- CSC Elective Credit 3.
- Data Science Application Elective Credit: 3.4

Senior Year

- Humanities/Fine Arts Elective Credit: 3.²
- Social/Behavioral Sciences Elective Credit: 3. (ECON 2010 or ECON 2020 recommended)²
- CSC 4100 Operating Systems Credit: 3.
- CSC 4200 Computer Networks Credit: 3.
- CSC 4220 Data Mining and Machine Learning Credit: 3.
- CSC 4610 Software Engineering I Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- Data Science Technical Elective Credit: 3.5
- <u>CSC 4040 Undergraduate Computing Research Experience</u> Credit: 3. or CSC 4990 - Computer Science Internship (Data Science only) Credit 3.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³Take your science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The other science must be in a different discipline.
- ⁴ Select from one of the following: CSC 3230, CSC 4575, GEOG 4510 (5510), MET 4650 (5650), MKT 3400 or BIOL 3810.
- ⁵ Select from one of the following: CSC 4240 (5240) or CSC 4760 (5760).

Curriculum for Data Science Concentration

Computer Science

- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- <u>CSC 1310 Data Structures and Algorithms</u> Credit: 4.
- CSC 2310 Object Oriented Programming and Design Credit: 4.
- CSC 2400 Design of Algorithms Credit: 3.
- CSC 2500 Unix Lab Credit: 1.
- <u>CSC 2700 Discrete Structures for Computer Science</u> Credit: 3.
- <u>CSC 2710 Foundations of Computer Science</u> Credit: 3.
- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- <u>CSC 4100 Operating Systems</u> Credit: 3.
- CSC 4200 Computer Networks Credit: 3.
- <u>CSC 4320 Computer Architecture</u> Credit: 3.
- CSC 4610 Software Engineering I Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- CSC Elective Credit 3.

Data Science

- CSC 3220 Fundamentals of Data Science Credit: 3.
- CSC 4220 Data Mining and Machine Learning Credit: 3.
- <u>CSC 4040 Undergraduate Computing Research Experience</u> Credit: 3. or <u>CSC 4990 - Computer Science Internship</u> (Data Science only) Credit 3.
- Data Science Application Elective Credit: 3.4
- Data Science Technical Elective Credit: 3.5

Mathematics

- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- MATH 2010 Introduction to Linear Algebra Credit: 3.
- MATH 3070 Statistical Methods I Credit: 3. or
 MATH 3470 Introductory Probability and Statistics Credit: 3.

General Education

- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- SPCH 2410 Introduction to Speech Communication Credit: 3. or
 - PC 2500 Communicating in the Professions Credit: 3.
- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- Humanities/Fine Arts Elective Credit: 6.²
- Social/Behavioral Sciences Elective Credit: 6. (ECON 2010 or ECON 2020 recommended)²
- HIST 2010 American History I Credit: 3.
- HIST 2020 American History II Credit: 3.
- Science Sequence Credit: 8. ³

Other

- ENGR 1020 Connections to Engineering and Technology Credit: 1. 1
- Lab Science Credit: 4.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³ Take your science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The other science must be in a different discipline.
- ⁴ Select from one of the following: CSC 3230, CSC 4575, GEOG 4510 (5510), MET 4650 (5650), MKT 3400 or BIOL 3810.
- 5 Select from one of the following: CSC 4240 (5240) or CSC 4760 (5760).

Curriculum for High Performance Computing Concentration

Freshman Year

- ENGR 1020 Connections to Engineering and Technology Credit: 1. ¹
- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- CSC 1310 Data Structures and Algorithms Credit: 4.
- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- Social/Behavioral Sciences Elective Credit 3.²
- <u>HIST 2010 American History I</u> Credit: 3.
- HIST 2020 American History II Credit: 3.
- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.

Sophomore Year

- <u>CSC 2310 Object Oriented Programming and Design</u> Credit: 4.
- <u>CSC 2400 Design of Algorithms</u> Credit: 3.
- <u>CSC 2500 Unix Lab</u> Credit: 1.
- CSC 2700 Discrete Structures for Computer Science Credit: 3.
- CSC 2710 Foundations of Computer Science Credit: 3.
- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- MATH 2010 Introduction to Linear Algebra Credit: 3.
- Science Sequence Credit 8. ³
- SPCH 2410 Introduction to Speech Communication Credit: 3. or PC 2500 - Communicating in the Professions Credit: 3.

Junior Year

- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3220 Fundamentals of Data Science Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- CSC 4200 Computer Networks Credit: 3.
- <u>CSC 4320 Computer Architecture</u> Credit: 3.
- CSC Elective Credit: 3.
- MATH 3070 Statistical Methods I Credit: 3. or
 MATH 3470 Introductory Probability and Statistics Credit: 3.
- <u>Social/Behavioral Sciences Elective</u> Credit 3.²
- Lab Science Credit 4.

Senior Year

- <u>CSC 4100 Operating Systems</u> Credit: 3.
- CSC 4610 Software Engineering I Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- CSC 4760 Parallel Programming Credit: 3.
- CSC 4770 Distributed and Cloud Computing Credit: 3.
- PDH Technical Elective Credit 3.⁴
- Humanities/Fine Arts Elective Credit 6.2
- Electives Credit 3.

Note

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³ Take your science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The other science must be in a different discipline.
- ⁴ Select from one of the following: CSC 4010, CSC 4420, and CSC 4400.

Curriculum for High Performance Computing Concentration

Computer Science

- CSC 1300 Introduction to Problem Solving and Computer Programming Credit: 4.
- CSC 1310 Data Structures and Algorithms Credit: 4.
- CSC 2310 Object Oriented Programming and Design Credit: 4.
- <u>CSC 2400 Design of Algorithms</u> Credit: 3.
- CSC 2500 Unix Lab Credit: 1.
- <u>CSC 2700 Discrete Structures for Computer Science</u> Credit: 3.
- CSC 2710 Foundations of Computer Science Credit: 3.
- CSC 3040 Professionalism, Communication and Research in Computing Credit: 3.
- CSC 3300 Database Management Systems Credit: 3.
- CSC 3410 Computer Organization and Assembly Language Programming Credit: 3.
- CSC 4100 Operating Systems Credit: 3.
- <u>CSC 4200 Computer Networks</u> Credit: 3.
- <u>CSC 4320 Computer Architecture</u> Credit: 3.
- CSC 4610 Software Engineering I Credit: 3.
- CSC 4620 Software Engineering II Credit: 3.
- CSC Elective Credit: 3.

Parallel, Distributed, and High Performance

- CSC 3220 Fundamentals of Data Science Credit: 3.
- CSC 4760 Parallel Programming Credit: 3.
- CSC 4770 Distributed and Cloud Computing Credit: 3.
- PDH Technical Elective Credit 3.4

Mathematics

- MATH 1910 Calculus I Credit: 4.
- MATH 1920 Calculus II Credit: 4.
- MATH 2010 Introduction to Linear Algebra Credit: 3.
- MATH 3070 Statistical Methods I Credit: 3. or
 MATH 3470 Introductory Probability and Statistics Credit: 3.

General Education

- ENGL 1010 English Composition I Credit: 3.
- ENGL 1020 English Composition II Credit: 3.
- SPCH 2410 Introduction to Speech Communication Credit: 3. or

PC 2500 - Communicating in the Professions Credit: 3.

- ENGL 2130 Topics in American Literature Credit: 3. or
 - ENGL 2230 Topics in British Literature Credit: 3. or
 - ENGL 2330 Topics in World Literature Credit: 3.
- Humanities/Fine Arts Elective Credit 6.2
- Social/Behavioral Sciences Elective Credit 6. ²
- HIST 2010 American History I Credit: 3.
- HIST 2020 American History II Credit: 3.
- Science Sequence Credit 8. ³

Other

- ENGR 1020 Connections to Engineering and Technology Credit: 1. ¹
- Lab Science Credit 4.
- Electives Credit 3.

- ¹ Not required for transfer students with more than 12 hours.
- ² See TBR General Education Core Requirements.
- ³Take your science sequence from BIOL 1105 -BIOL 1114, BIOL 1105-BIOL 2110, CHEM 1110-CHEM 1120, GEOL 1040-GEOL 1045 or PHYS 2110-PHYS 2120. The other science must be in a different discipline.
- $^{\rm 4}$ Select from one of the following: CSC 4010, CSC 4420, and CSC 4400.