## Computer Science

### Major

<table>
<thead>
<tr>
<th>Concentration in</th>
<th>Major</th>
<th>FOR NETWORKS CONCENTRATION</th>
<th>Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETWORKS</td>
<td>Hours Required in Computer Science: 50</td>
<td>50</td>
<td>20</td>
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<tr>
<td></td>
<td>Hours Required in Other Departments: 32</td>
<td>32</td>
<td>0</td>
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<tr>
<td></td>
<td>Total Hours Required: 82</td>
<td>82</td>
<td>20</td>
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### Mission Statement

The Computer Science & Information Technologies Department’s mission is to present our students with up-to-date curricula and pedagogy in the computer science and information systems disciplines, ensure that they have a solid foundation in the core concepts, equip them with problem solving and decision-making skills, and prepare them for lifelong learning in the discipline. The department provides for and encourages collegial, intellectual, and academic growth of its faculty. The department supports and encourages local and regional technology initiatives contributing to educational and economic advances.

### Program Educational Objectives

The Frostburg Computer Science program will graduate computer science professionals who have:

- A solid foundation in core computer science concepts reinforced with mathematics and natural science
- An ability to apply modern computer science concepts and theories to contemporary, real world problems
- An understanding of professional responsibility to evaluate their ethical obligations to society, employers, employees and their peers
- An understanding of the commitment needed to pursue life long goals through educational and professional endeavors

### Program Outcomes

The Frostburg Computer Science program will provide students with:

- An ability to apply knowledge of computing and mathematics appropriate to the discipline;
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
- An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;
- An ability to function effectively on teams to accomplish a common goal;
- An understanding of professional, ethical, legal, security, and social issues and responsibilities;
- An ability to communicate effectively with a range of audiences;
- An ability to analyze the local and global impact of computing on individuals, organizations and society;
- A recognition of the need for, and an ability to engage in, continuing professional development;
- An ability to use current techniques, skills, and tools necessary for computing practices;
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
- An ability to apply design and development principles in the construction of software systems of varying complexity.

### Summary of Requirements for Major/Minor in Computer Science

#### Major

1. **Core Courses:** (26 hours)
   - COSC 101 The Discipline of Computer Science (Tech. Fluency)
   - COSC 102 Foundations of Computer Science
   - COSC 240 Computer Science I
   - COSC 241 Computer Science II
   - COSC 325 Software Engineering
   - COSC 365 Digital Logic
   - COSC 460 Operating Systems Concepts
   - COSC 489 Computer Science Capstone

2. **Required Advanced Courses:** (18 hours)
   - COSC 310 Data Structures & Algorithm Analysis
   - COSC 331 Fundamentals of Computer Networks
   - COSC 350 Low-Level Programming Concepts
   - COSC 450 Programming Language Principles & Paradigms
   - COSC 470 Compiler Design and Implementation
   - COSC 485 Introduction to the Theory of Computation

#### Minor

1. **Core Courses:** (11 hours)
   - COSC 101 The Discipline of Computer Science (Tech. Fluency)
   - COSC 240 Computer Science I
   - COSC 241 Computer Science II

2. **Electives:** (9 hours)
   - Three additional computer science courses.
   - Two must be at the 300-level or above.
Requirements for Major Concentrating in Networks

1. Core Courses: (26 hours)
   - COSC 101 The Discipline of Computer Science (Tech. Fluency)
   - COSC 102 Foundations of Computer Science
   - COSC 240 Computer Science I
   - COSC 241 Computer Science II
   - COSC 325 Software Engineering
   - COSC 365 Digital Logic
   - COSC 460 Operating Systems Concepts
   - COSC 489 Computer Science Capstone

2. Required Advanced Courses: (15 hours)
   - COSC 331 Fundamentals of Computer Networks
   - COSC 335 Advanced Topics in Computer Networks
   - COSC 345 The Internet and Multimedia Communications
   - COSC 431 Secure Computing
   - COSC 435 Network Implementation and Testing

3. Other Required Courses:
   **Mathematics (14 hours)**
   - MATH 236 Calculus I (Core Skill 3)
   - MATH 237 Calculus II
   - MATH 350 Linear Algebra I
     or MATH 432 Differential Equations
     or MATH 435 Numerical Analysis
     or MATH 437 Combinatorics and Graph Theory
     or MATH 470 Mathematical Models and Applications
   - MATH 380 Introduction to Probability & Statistics

**Science (12 hours):**
Select two courses from the following:
- BIOL 149 General Biology I
- CHEM 201 General Chemistry I
- GEOG 103 Physical Geography
- PHYS 261 Principles of Physics I: Mechanics

And select one course from the following:
- BIOL 160 General Zoology
- BIOL 161 General Botany
- CHEM 202 General Chemistry II
- PHYS 262 Principles of Physics II: Electricity and Magnetism

**Other (6 hours):**
- CMST 102 Introduction to Human Communication
- ENGL 338 Technical Writing (Core Skill 2)

4. Electives: (6 hours)
   A minimum of 6 hours in at least two courses
   - COSC 305 Computer Ethics
   - COSC 335 Advanced Topics in Computer Networks
   - COSC 345 The Internet and Multimedia Communications
   - COSC 390 Topics in Modern Programming Languages
   - COSC 415 Computer Interfacing
   - COSC 420 Robotics and Industrial Computer Applications
   - COSC 431 Secure Computing
   - COSC 435 Network Implementation and Testing
   - COSC 440 Database Management Systems
   - COSC 444 Introduction to Distributed Programming
   - COSC 445 Network Programming
   - COSC 455 Artificial Intelligence
   - COSC 465 Computer Systems Architecture
   - COSC 475 Interactive Computer Graphics
   - COSC 491 Seminar in Computer Science
   - COSC 494 Field Exp. in Computer/Information Science
   - COSC 499 Individual Problems in Computer Science
**Science:** (12 hours):
Select two courses from the following:
- BIOL 149 General Biology I
- CHEM 201 General Chemistry I
- GEOG 103 Physical Geography
- PHYS 261 Principles of Physics I: Mechanics

And select one course from the following:
- BIOL 160 General Zoology
- BIOL 161 General Botany
- CHEM 202 General Chemistry II
- PHYS 262 Principles of Physics II: Electricity and Magnetism

**Other:** (6 hours)
- CMST 102 Introduction to Human Communication
- ENGL 338 Technical Writing (Core Skill 2)

**4. Electives:** (9 hours)
A minimum of 9 hours in at least three courses:
- COSC 305 Computer Ethics
- COSC 310 Data Structures and Algorithm Analysis
- COSC 350 Low-Level Programming Concepts
- COSC 390 Topics in Modern Programming Languages
- COSC 444 Introduction to Distributed Programming
- COSC 445 Network Programming
- COSC 450 Programming Language Principles & Paradigms
- COSC 455 Artificial Intelligence
- COSC 465 Computer Systems Architecture
- COSC 485 Introduction to the Theory of Computation
- COSC 491 Seminar in Computer Science
- COSC 494 Field Exp. in Computer/Information Science
- COSC 499 Individual Problems in Computer Science

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**Certificates in**
- SOFTWARE DEVELOPMENT
- PROGRAMMING
- NETWORKING

The three computer science certificates offer learning opportunities to a range of students, from computing novices to computing professionals.

Interested students might include:
- Degree-seeking undergraduates in any major who wish to develop computing skills beyond those required in their degree program. The certificate represents a credential that may enhance career opportunities in any field.
- Non-degree-seeking students who wish to develop computing and technical skills to increase opportunities for employment.
- Bachelor's degree holders and professionals in the field looking for career enhancement or change.
- If you are completing the networks concentration in the computer science major you cannot earn the networking certificate.

**Software Development** (14 hours)
- COSC 101 The Discipline of Computer Science (Tech. Fluency)
- COSC 240 Computer Science I
- COSC 241 Computer Science II
- COSC 325 Software Engineering

**Programming** (14 hours)
- COSC 101 The Discipline of Computer Science (Tech. Fluency)
- COSC 240 Computer Science I
- COSC 241 Computer Science II

And one of the following:
- COSC 310 Data Structures & Algorithm Analysis
- COSC 390 Topics in Modern Programming Languages

**Networking** (17 hours)
- COSC 241 Computer Science II (COSC 240 is prerequisite for COSC 241. Students may test out of COSC 240)
- COSC 335 Advanced Topics in Computer Networks
- COSC 365 Digital Logic
- COSC 435 Network Implementation and Testing
- COSC 445 Network Programming

- A study of programming fundamentals and software development methods for a student with basic computing skills.

- A study sequence for students with basic computing skills that provides a foundation in computer programming fundamentals and working expertise in an object-oriented programming language.

- A study sequence for students with programming experience wishing to develop expertise in network theory, design, and application. Permission of department chair required.
Cultural Anthropology

Minor

Coordinator:
Kara Rogers-Thomas, Associate Professor, Department of Sociology

- You cannot major in Cultural Anthropology.

Summary of Requirements for Minor in Cultural Anthropology

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<tr>
<th>Minor</th>
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<tr>
<td><strong>1. Basic Courses:</strong> (9 hours)</td>
<td><strong>18</strong></td>
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<tr>
<td>SOCI 100/111 Intro to Sociology (GEP Group D)</td>
<td>ENGL 280 Mythology and Literature</td>
</tr>
<tr>
<td>SOCI 224 Cultural Anthropology (GEP Group F)</td>
<td>GEOG 104/114 Human Geography (GEP Group D or F)</td>
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<tr>
<td>SOCI 362 Sociology of Religion</td>
<td>GEOG 110 World Regional Geography (GEP Group D or F)</td>
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| **2. Distribution of Electives:** (9 hours) | |
| At least 6 of which must be in two different disciplines other than Sociology. | |
| AAST 300/HIST 301 Traditional Africa | HIST 418 Native Peoples of the Americas (GEP Group F) |
| AAST 400 Africans of the Diaspora | INST 150 Introduction to World Religions (GEP Group F) |
| ART 302 Artistic Traditions: Africa and the Americas | INST 200 Intro. to International Studies (GEP Group F) |
| BIOL 128 Introduction to Ethnobotany | MUSC 117 Music of Africa, Asia, & the Americas (GEP Group F) |
| BIOL 484 Field Experiences in Ethnobotany | SOCI 350 Folklore in Appalachia |
| | SOCI 334 Gender and Social Life |
| | SOCI 306 The Sociology of African Americans |

Dance

Minor

Coordinator:
Jamie McGreevy, Coordinator of Dance minor
Nicole Mattis, Chair, Department of Theatre and Dance

- You cannot major in Dance.

Summary of Requirements for Minor in Dance

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<tr>
<th>Minor</th>
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<tr>
<td><strong>1. Courses in Dance Technique:</strong> (12 hours)</td>
<td><strong>23-24</strong></td>
</tr>
<tr>
<td>DANC 131 Ballet I</td>
<td>DANC 355 Dance Company II (3 hours)</td>
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<tr>
<td>DANC 154 Jazz I</td>
<td>DANC 429 Special Topics in Dance (3 or 6 hours)</td>
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<tr>
<td>DANC 165 Tap I</td>
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<tr>
<td>Select a minimum of 6 credits from among:</td>
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<tr>
<td>DANC 231 Ballet II</td>
<td>HEED 200 Nutrition</td>
</tr>
<tr>
<td>DANC 254 Jazz II</td>
<td>MUSC 100 Introduction to Music Theory</td>
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<tr>
<td>DANC 265 Tap II</td>
<td>THEA 110 Introduction to Acting</td>
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<tr>
<td>DANC 342 Contemporary Modern</td>
<td>THEA 210 Voice and Movement</td>
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<tr>
<td>DANC 361 Dance for Musical Theatre</td>
<td>THEA 306 Stage Lighting</td>
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| **2. Courses in Dance Composition and Theory:** (9 hours) | |
| DANC 110 Dance Appreciation (GEP Group A) | |
| Select a minimum of 6 hours from among: | |
| DANC 255 Dance Company I (3 or 6 hours) | |
| DANC 305 Improvisation | |
| DANC 309 Composition and Theory | |