COMPUTER SCIENCE MINOR

Required Courses
CSC/CPE 101 Fundamentals of Computer Science 4
CSC/CPE 202 Data Structures 4
CSC/CPE 203 Project-Based Object-Oriented Programming and Design 4

Approved Electives
Select from the following: 12

CPE 315 Computer Architecture
CPE 316 Microcontrollers and Embedded Applications
CPE 329 Microcontroller-Based Systems Design
CPE 333 Computer Hardware Architecture and Design
CPE 416 Autonomous Mobile Robotics
CPE 426 Introduction to Hardware Security
CPE/EE 428 Computer Vision
CPE 439 Introduction to Real-Time Operating Systems
CPE/EE 442 Real Time Embedded Systems
CPE 446 Design of Fault-Tolerant Digital Systems
CPE 464 Introduction to Computer Networks
CPE 465 Advanced Computer Networks
CSC 300 Professional Responsibilities
CSC 305 Individual Software Design and Development
CSC 307 Introduction to Software Engineering
CSC 308 Software Engineering I
CSC 309 Software Engineering II
CSC 313 Teaching Computing
CSC 320 Practical Computer Security for Everyone

CSC/CPE 321 Introduction to Computer Security
CSC 323 Cryptography Engineering
CSC 325 Introduction to Privacy: Policy and Technology
CSC 344 Music Programming
CSC 349 Design and Analysis of Algorithms
CSC/CPE 357 Systems Programming

CSC 364 Introduction to Networked, Distributed, and Parallel Computing
CSC 365 Introduction to Database Systems
CSC 366 Database Modeling, Design and Implementation
CSC 369 Introduction to Distributed Computing
CSC 371 Game Design
CSC 377 Introduction to Mixed Reality
CSC 378 Interactive Entertainment Engineering
CSC 400 Special Problems

CSC 409 Current Topics in Software Engineering
CSC 410 Software Evaluation
CSC 421 Binary Exploitation: Tools and Techniques
CSC/CPE 422 Network Security
CSC 424 Software Security
CSC/CPE 425 Wireless Security
CSC 429 Current Topics in Computer Security
CSC 430 Programming Languages
CSC/CPE 431 Compiler Construction
CSC 436 Mobile Application Development
CSC 437 Dynamic Web Development
CSC 445 Theory of Computation I
CSC 448 Bioinformatics Algorithms
CSC/CPE 453 Introduction to Operating Systems
CSC/CPE 454 Implementation of Operating Systems
CSC/CPE 458 Current Topics in Computer Systems
CSC 466 Knowledge Discovery from Data
CSC 468 Database Management Systems Implementation
CSC/CPE 469 Distributed Systems
CSC/CPE 471 Introduction to Computer Graphics
CSC 473 Advanced Rendering Techniques
CSC 474 Computer Animation
CSC/CPE 476 Real-Time 3D Computer Graphics Software
CSC 477 Scientific and Information Visualization
CSC 478 Current Topics in Computer Graphics
CSC 480 Artificial Intelligence
CSC 481 Knowledge Based Systems
CSC 482 Speech and Language Processing
CSC 484 User-Centered Interface Design and Development
CSC 486 Human-Computer Interaction Theory and Design
CSC 487 Deep Learning
CSC 490 Selected Advanced Topics
CSC 508 Software Engineering I
CSC 509 Software Engineering II
CSC 513 Computing Education Research and Practice
CSC/CPE 515 Computer Architecture
CSC 521 Computer Security
CSC 524 System Security
CSC 530 Languages and Translators
CSC 540 Theory of Computation II
CSC 549 Advanced Algorithm Design and Analysis
CSC 550 Operating Systems
CSC 560 Database Systems
CSC/CPE 564 Computer Networks: Research Topics
### Computer Science Minor

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 566</td>
<td>Topics in Advanced Data Mining</td>
</tr>
<tr>
<td>CSC 569</td>
<td>Distributed Computing</td>
</tr>
<tr>
<td>CSC 570</td>
<td>Current Topics in Computer Science ³</td>
</tr>
<tr>
<td>CSC 572</td>
<td>Computer Graphics</td>
</tr>
<tr>
<td>CSC 580</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>CSC 581</td>
<td>Computer Support for Knowledge Management</td>
</tr>
<tr>
<td>CSC 582</td>
<td>Computational Linguistics</td>
</tr>
<tr>
<td>CSC 587</td>
<td>Advanced Deep Learning</td>
</tr>
<tr>
<td>DATA 301</td>
<td>Introduction to Data Science</td>
</tr>
</tbody>
</table>

**Total units**: 24

1. Choose from CSC/CPE upper-division courses open to CSC majors. Must be approved via the CSC minor form upon acceptance to the minor.
2. Cannot take both CSC 320 and CSC 321 as Approved Electives.
3. Must be approved via the CSC minor form, signed by the minor advisor.