



## 2 Computer Science (CSCI)

- CSCI 316 Professional Software Dev** 4.0 SH [ ]  
Practical industrial software development, including methods for mastering and contributing to existing large codebases, and the use of standard tools for source control, testing, and documentation.  
**Prerequisite:** CSCI 240.
- CSCI 320 Database Management Systems** 4.0 SH [ ]  
The utilization of database systems within organizational settings. Includes features of database management systems, various data models, database design, normalization, SQL, various indexing techniques, and data integrity and recovery issues.  
**Prerequisite:** CSCI 171 and CSCI 182 with a grade of C or better.  
**Class Level Restriction:** Sophomore and Junior and Senior only.
- CSCI 324 Web Development** 4.0 SH [ ]  
Design and development of client and server-side web applications, using libraries, and technologies relevant as of the time of course offering. Coverage of scripting language concepts including closure, dynamic typing, and prototypes. The class is project-oriented, and students will complete a significant web application.  
**Prerequisite:** CSCI 320.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 330 Operating Systems** 3.0 SH [ ]  
The inner workings of several popular multiprogramming operating systems are compared. Topics include processor scheduling, device management, memory management, and parallel processing.  
**Prerequisite:** CSCI 263.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 333 Computer Networking** 3.0 SH [ ]  
Introduction to Local Area and Wide Area computer networks. Topics include network topologies, ISO protocols, Ethernet, TCP/IP, and network support for distributed computing. The course emphasizes the science of networking (as opposed to network administration).  
**Prerequisite:** Either CSCI 171 or CSCI 181 with a grade of C or better and CSCI 182 with a C or better.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 335 Cloud Computing** 3.0 SH [ ]  
Learn how to configure a cloud-resident website or mobile app able to scale to millions of users. Build sophisticated software rapidly by integrating existing cloud-resident services into software to meet particular needs.  
**Prerequisite:** CSCI 240.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 337 Cybersecurity** 3.0 SH [ ]  
This course introduces the importance of cybersecurity and covers its various components, including writing software that is invulnerable to cyberattack, common methods of cyberattack, secure encryption algorithms, firewall configuration, intrusion prevention/detection, and honeypots.  
**Prerequisite:** CSCI 240.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 340 Advanced Algorithms** 4.0 SH [ ]  
Survey of algorithms, with an emphasis on the application of algorithmic theory to the solution of practical problems. Categories include algorithm taxonomy, greedy algorithms, dynamic programming, divide-and-conquer, and intelligent search. Various specific algorithms exemplifying these categories are drawn from a variety of application areas such as compression, encryption, graph problems, sorting, computational geometry, and string matching.  
**Prerequisite:** CSCI 240.  
**Class Level Restriction:** Junior and Senior only.

- CSCI 342 Machine Learning** **4.0 SH** [ ]  
 Mathematics and software design of machine learning systems, including dense, convolutional, and recurrent deep learning architectures, the mathematics of high-dimensional pattern spaces and gradient descent optimization, and non deep-learning algorithms such as support vector machines and decision trees. Students will build and train a machine learning system.  
**Prerequisite:** CSCI 240 with a grade of C- or better.  
**Class Level Restriction:** Sophomore and Junior and Senior only.
- CSCI 344 Data Science** **4.0 SH** [ ]  
 Theoretical and practical aspects of the analysis of very large datasets, including classic statistical methods like correlation and PCA, unsupervised learning methods like K-means and other clustering, supervised methods like decision trees and SVMs. An extra credit project may also involve using recent mathematical tools for causality analysis.  
**Prerequisite:** CSCI 240 and MATH 273.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 350 Computer Graphics** **4.0 SH** [ ]  
 Graphics software development and use of application programming interfaces for 3D graphics. The graphics pipeline, modeling, geometric and viewing transforms, lighting and shading, rendering, interaction techniques and graphics hardware. Completion of a graphics software project.  
**Prerequisite:** CSCI 240 with a grade of C or better.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 380 Compilers** **4.0 SH** [ ]  
 Concepts necessary for designing and developing a compiler. Topics include lexical analysis, parsing, semantic analysis, symbol table management, and code generation. Students will implement a small compiler as a project.  
**Prerequisite:** CSCI 240 and CSCI 263.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 390 Topics in Computer Science** **1.0-5.0 SH** [ ]  
 Topics will vary from year to year based on the needs and interests of students and instructor. All offerings will involve in-depth study of a specific topic, software design, the construction of working software, and self-instruction in addition to standard instruction. May be taken more than once if topics are different.  
**Prerequisite:** CSCI 240.
- CSCI 410 Capstone Proposal** **1.0 SH** [ ]  
 Students research and prepare a capstone proposal in preparation for completing a computer science capstone project. The proposal must be approved by the computer science faculty prior to taking CSCI 415.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 415 Capstone** **3.0 SH** [ ]  
 A student-designed project with a significant programming component which pulls together the student's major. Choices include independents, internships, or group projects.  
**Prerequisite:** CSCI 410.  
**Class Level Restriction:** Junior and Senior only.
- CSCI 421 Computer Issues Seminar** **3.0 SH** [ ]  
 An examination and discussion of pressing computer issues facing society. Topics include personal impact, societal impact, artificial intelligence, privacy, and ethics. Majors from other disciplines are encouraged to take this course if they have taken any other computer science course.  
**Class Level Restriction:** Junior and Senior only.