COMPUTING TECHNOLOGY (COMP)

\# Course numbers with the # symbol included (e.g. #400) have not been taught in the last 3 years.

COMP 801 - Integrated Computing Practice
Credits: 3

Student learning in this course focuses on the development and application of professional computing competencies. To achieve this goal, students will engage in project management activities, collaborate with peers and participate in teamwork, give presentations and receive feedback, make effective use of appropriate tools and platforms, and gain practice with test-driven iterative development and version control.
Grade Mode: Letter Grading

COMP 805 - Full Stack Development
Credits: 3

Students work in teams and implement, test, document, demonstrate, and deploy web systems that solve organizational needs expressed by real clients. Emphasis is on advanced server-side and client-side programming and integration of web applications with database and web server applications. Free and open source development and communication tools are used to carry out the course project.
Grade Mode: Letter Grading

COMP 815 - Information Security
Credits: 3

Topics include general security principles and practices, network and system security, access control methodology, and cryptography. Students develop a basic cryptographic system based on sound mathematical principles, elaborate on its features and refine it, and experiment with various ways to attack it. Some programming required.
Grade Mode: Letter Grading

COMP 820 - Database Systems and Technologies
Credits: 3

This is a project course that provides practical experience with database systems and technologies. Topics include data modeling, database design, system development and integration, database administration, and configuration and project management. The course emphasizes communication and collaboration with online tools. Project artifacts and activities are supported by current version control and database development and administration tools.
Grade Mode: Letter Grading

COMP 821 - Big Data for Data Engineers
Credits: 3

In this course students gain practical experience developing data-oriented applications in modern infrastructure frameworks, also known as cloud data solutions. Guided by what a data scientist profile is, students become familiar with the use cases of data oriented applications. They will apply key data modeling and data design concepts to meet business requirements. Students will also apply modern software development to iteratively construct solutions using established reference architectures. Project work will be based in Google Cloud Platform and Amazon Web Services.
Grade Mode: Letter Grading
Special Fee: Yes

COMP 825 - Programming Languages
Credits: 3

Explores the main features of modern, high-level, general purpose programming languages from the user point of view. Provides students with an opportunity to use non-imperative programming paradigms, such as object-oriented, functional, and visual, and to learn how specific features of such languages can be used efficiently in solving problems. The purpose is to gain knowledge regarding the languages studied as well as providing the basis to conduct analysis related to comparisons and divergence in capabilities.
Grade Mode: Letter Grading

COMP 830 - Software Development
Credits: 3

Presents an iterative methodology for developing software systems. Development activities include requirements elicitation and analysis, system and object design, implementation and testing, project and configuration management, infrastructure maintenance, and system deployment to end user. Students work in teams, assume developer roles, build models of a real-world system, and deliver a proof-of-concept or prototype.
Grade Mode: Letter Grading

COMP 835 - Secure Networking Technologies
Credits: 3

In this course students study modern computer networking and focus on principles, architectures, protocols, security, and cloud. Modern IT and cloud computing call for expertise in security, which is a theme across all computing subjects, as well as a core area of study. Course requirements include both programming and administrative exercises to explore and gain practice with networking topics.
Grade Mode: Letter Grading

COMP 840 - Machine Learning Applications and Tools
Credits: 3

Introduces students to practical approaches of machine learning. The course is an exploration of creative applications of artificial intelligence using modern machine learning components and tools, including deep learning techniques. Different application domains are considered, such as computer vision, natural language processing, and cyber security. Students learn to evaluate the effectiveness of machine learning systems as well as their potential prediction problems.
Grade Mode: Letter Grading

COMP 841 - Practical Artificial Intelligence
Credits: 3

Balancing the science of AI with its engineering applications, the course focuses on AI foundations and principles for building intelligent computational systems. Reasoning, planning, learning, explaining, and acting with certainty and uncertainty are AI areas in which students will practice how to build AI systems that solve real-world problems. Particular attention is given to the impact of AI applications on our society and related ethical, privacy, security, and safety implications.
Grade Mode: Letter Grading

COMP 842 - Fundamentals of Computer Vision
Credits: 3

This course provides a comprehensive introduction to computer vision, covering both the theoretical and practical skills needed to pursue a career in computer vision, pattern recognition, image processing, and signal processing. Students will learn basic concepts as well as hands-on experience to solve various real-life problems in image processing, feature extraction, object recognition, and image understanding. Not offered for credit if credit is received for COMP 880 Topics Computer Vision.
Grade Mode: Letter Grading

COMP 845 - Fundamentals of Computer Vision
Credits: 3

This course provides a comprehensive introduction to computer vision, covering both the theoretical and practical skills needed to pursue a career in computer vision, pattern recognition, image processing, and signal processing. Students will learn basic concepts as well as hands-on experience to solve various real-life problems in image processing, feature extraction, object recognition, and image understanding. Not offered for credit if credit is received for COMP 880 Topics "Computer Vision".
Grade Mode: Letter Grading

COMP 850 - Neural Networks
Credits: 3

Artificial neural networks power the recent advances in computer vision, speech recognition, and machine translation. This is a first course on neural networks with a focus on applications in computer vision and natural language processing. Topics will include generic feedforward neural networks, convolutional neural networks for computer vision tasks, and recurrent neural networks with application to natural language processing, with other topics to be selected based on the interests of the instructor and the class.
Equivalent(s): DATA 850
Grade Mode: Letter Grading

COMP 851 - System Integration and Architecture
Credits: 3

Students work in teams to explore and practice various system integration techniques to address requirements, software and hardware acquisitions, integration issues, and acceptance testing. Specific focus is given to diagnosing and troubleshooting systems interoperability and interface integration issues. Students develop project plans and study the influence of business processes and culture on system architecture decisions. Studied techniques are compared and contrasted to derive lessons learned, best practices, and critical success factors.
Grade Mode: Letter Grading

COMP 855 - Digital Forensics
Credits: 3

This course studies cyber-attack prevention, planning, detection, response, and investigation with the goals of counteracting cybercrimes. The topics covered in this course include fundamentals of digital forensics, forensic duplication and analysis, network surveillance, intrusion detection and response, incident response, anti-forensics techniques, anonymity and pseudonymity, computer security policies and guidelines, and methods and standards for extraction and preservation of digital evidence.
Grade Mode: Letter Grading

COMP 860 - Data Visualization & Communication
Credits: 3

Through hand-on experience with a leading data-visualization tool, the course introduces the concepts of data visualization to allow students to communicate and analyze data effectively using visual techniques.
Grade Mode: Letter Grading

COMP 880 - Topics
Credits: 1-3

This course includes topics and emerging areas in computing. Barring duplication of subject the course may be repeated for credit.
Repeat Rule: May be repeated up to unlimited times.
Grade Mode: Letter Grading

COMP 885 - Applied Cryptography
Credits: 3

This course aims to give students an overview of cryptographic concepts and methods, a good knowledge of some commonly used cryptographic primitives and protocols, a sound understanding of theory and implementation, as well as limitations and vulnerabilities, and an appreciation of the engineering difficulties involved in employing cryptographic tools to build secure systems. Some programming required.
Grade Mode: Letter Grading

COMP 890 - Internship and Career Planning
Credits: 1

This course is recommended for any student seeking internship and/or employment opportunities. Participants research and evaluate computing-related career opportunities related to their interests. create application portfolio, conduct informational interviews, use networking and job search resources, and participate in employer-based resume reviews and mock interviews. This course cannot be repeated for credit.
Grade Mode: Letter Grading

COMP 891 - Internship Practice
Credits: 1-3

The Internship Practice provides field-based learning experience through placement in a computing field. Students gain practical computing experience in a business, non-profit, or government organization. Under the direction of a workplace supervisor and a faculty advisor, the student is expected to contribute to the computing products, processes, or services of the organization.
Repeat Rule: May be repeated for a maximum of 6 credits.
Grade Mode: Letter Grading

COMP 892 - Applied Research Internship
Credits: 1-3

This Applied Research Internship enhances the student's academic achievements with real-world, professional computing applied research projects at a sponsoring organization. The student is expected to apply knowledge and skills acquired through other coursework in the major to address a research question in information technology related fields under the direction of a faculty advisor and a site supervisor at the organization.
Repeat Rule: May be repeated for a maximum of 6 credits.
Grade Mode: Letter Grading

COMP 895 - Independent Study
Credits: 1-3

Advanced individual study under the direction of a faculty mentor. Content area to be determined in consultation with faculty mentor. May be repeated.
Grade Mode: Letter Grading

COMP 898 - Master's Project
Credits: 3
Guided project on a topic which has been approved as a suitable subject for a master's project. Supervision and advising by faculty in the Computing Technology program. Completion of 24 credits in the major.
Grade Mode: Letter Grading

COMP 899 - Master's Thesis
Credits: 1-6
Guided research on a topic which has been approved as a suitable subject for a master's thesis. Supervision and advising by faculty of the Computing Technology program.
Repeat Rule: May be repeated for a maximum of 6 credits.
Grade Mode: Graduate Credit/Fail grading