COMPUTER INFORMATION SCIENCE (CPSC)

CPSC 4315 Network System Administration 3 Credits
Department: College of Arts and Sciences
Topics include system security, shell programming, setting up user accounts, system configuration, system startup, management of file systems and disks, and backup and restore operations.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4317 Computer Networks 3 Credits
Department: College of Arts and Sciences
This course is about principles and applications of computer communication, networking communication protocols, the internet, LANs, packet-switching networks, network architecture.
Prerequisite(s): COSC 2336
Prerequisite(s)/Corequisite(s): COSC 4302
Restriction(s):
Students with a class of Freshman, Junior or Sophomore may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4324 Big Data Computer Systems 3 Credits
Department: College of Arts and Sciences
This course provides an overview of the state-of-the-art Big Data Computer Systems and explores the current trends and future challenges for big data related issues. The goal of this course is to allow you to gain an in-depth understanding of big data concepts, various big data sources and systems, technology platforms for big data analytics, analytical data environments and algorithms for data analytics.
Prerequisite(s): COSC 2336 and COSC 3302 and COSC 4310 and COSC 4302
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4326 Android Programming 3 Credits
Department: College of Arts and Sciences
This is an introductory course in Android programming. Topics include history of Android, hardware, development tools, text-based applications, multi-media applications, accessing the Internet from an application, and user interface design.
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4327 Advanced Android Programming 3 Credits
Department: College of Arts and Sciences
This is an advanced course in Android programming. Topics include design, marketing, custom Views, 3D graphics, SMS, text-to-speech, advanced application preferences, View animation, background processing and network programming.
Prerequisite(s): CPSC 4326
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4330 Multimedia Processing 3 Credits
Department: College of Arts and Sciences
Television style viewing and sound interfacing to computer systems. Software and architectural interconnection requirements of digital interactive video and audio technology, graphical user interface. Definition, examples, application, review of major implementations, and architecture of hypertext systems. Voice technology: synthesis, recognition and response. Student projects.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4335 Image Processing 3 Credits
Department: College of Arts and Sciences
This course introduces the basic algorithms of image processing, including image enhancement, image filtering, feature detection, Fourier transform, geometric transforms, color processing and image compression. the goal of this course is to give students an understanding of how image processing algorithms work and what algorithms to apply for solving a given problem, as well as the necessary foundation to develop new image processing algorithms.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4340 Database Design 3 Credits
Department: College of Arts and Sciences
Logical and physical database system organization; logical models; design issues; secondary storage considerations. Design issues emphasizing the normal decomposition theory of the n-ary relational data model, the RM/T model and an introduction to logical implementations of databases.
Prerequisite(s): COSC 2336 and COSC 2375
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4345 Big Data Warehousing 3 Credits
Department: College of Arts and Sciences
This is an introductory course on bug data warehousing and the general objective of the course is to provide a thorough understanding of data warehouse architecture, conceptual, logical and physical design of data warehouse, data cube computation, indexing and query processing. It also provides the fundamental knowledge for the processes by which a data warehouse system is designed and developed and understanding the importance of multidimensional data modeling and its differences with other data modeling.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4355 Data Mining 3 Credits
Department: College of Arts and Sciences
This is an introductory course on data mining and the general objective of the course is to teach students fundamental concepts in data mining and study various analytical techniques of data mining to extract information from a variety of datasets. the curse covers various techniques including data cleaning, integration, transformation, classification, prediction, clustering, association rules and application of data mining tools for discovering new knowledge from large datasets.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4360 Software Engineering 3 Credits
Department: College of Arts and Sciences
Systems analysis, software requirements analysis and definition, specification techniques, software design methodologies, performance measurement, validation and verification and quality assurance techniques.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4361 Secure Software Engineering 3 Credits
Department: College of Arts and Sciences
This course covers five main secure software engineering topics, such as security, defensive programming, reliability, program understandability and programmer misconception.
Prerequisite(s): CPSC 4360
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4363 Cybersecurity: Systems 3 Credits
Department: College of Arts and Sciences
This course provides a hands-on study of various attacks and defending techniques on computer software and hardware, including malware, OS security, web security, smartphone security and hardware security. Basics of C programming, OS and HTML will also be covered.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4365 Data Science and Big Data Aalysis 3 Credits
Department: College of Arts and Sciences
This course is intended for students who are interested in data science and big data analysis. It includes an introduction to data science, data analytic methods, big data, and R programming language. The course focuses on concepts, principles, methods, tools and practical applications.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4370 Artificial Intelligence 3 Credits
Department: College of Arts and Sciences
Introduction to concepts and ideas in artificial intelligence. Topics include search techniques, knowledge representation, control strategies and advanced problem-solving architecture.
Prerequisite(s): COSC 2336
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4375 Machine Learning 3 Credits
Department: College of Arts and Sciences
This course is an introduction to machine learning, the study of how to make a machine change its actions automatically to improve its performance. Minimum passing grade of "C" for Computer Science majors. Prerequisites: knowledge of a high-level programming language.
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4380 3D Modeling for Computer Graphics 3 Credits
Department: College of Arts and Sciences
This introductory course in three-dimensional (3D) modeling covers techniques for creating content designed for use in real-time computer graphics applications using appropriate software with particular emphasis on computer games. Topics include mathematical foundations, 3D file formats, creation and modification of 3D geometric shapes, surface texturing, lighting, rendering and a survey of current software tools and techniques.
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 4381 3D Animation for Computer Graphics 3 Credits
Department: College of Arts and Sciences
This introductory course in three-dimensional (3D) animation covers techniques for programming in C++ and creating content designed for use in real-time computer graphics applications using appropriate software with particular emphasis on computer games and character animation. Topics include rigid versus non-rigid body animation, skeletal techniques, morphing, kinematics, animation blending, key framing, time coding, motion capture, lip sync, synchronization methods, file formats and a survey of current software tools and techniques. It is recommended that students complete CPSC 4380 prior to taking this course
Prerequisite(s): COSC 2336
Prerequisite(s)/Corequisite(s): COSC 3306
Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5326 Android Programming 3 Credits
Department: College of Arts and Sciences
This is an introductory course in Android programming. Topics include history of Android, hardware, development tools, text-based applications, multi-media applications, accessing the Internet from an application, and user interface design. Prior experience with Java is highly recommended.
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5327 Advanced Android Programming 3 Credits
Department: College of Arts and Sciences
This is an advanced course in Android programming.
Prerequisite(s): CPSC 5326
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5328 Real Time Systems 3 Credits
Department: College of Arts and Sciences
This course emphasizes two main real-time topics: Real-time scheduling algorithms and schedulability analysis, and formal analysis and verification of real-time systems. It is recommended that students be familiar with symbolic logic and programming languages such as Java or C++
Prerequisite(s): COSC 2336
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5330 Adv Multimedia Processing 3 Credits
Department: College of Arts and Sciences
Television style viewing and sound interfacing to computer systems. Software and architectural interconnection requirements of digital interactive video and audio technology. Graphical user interface. Definition, examples, application, review of major implementations, and architecture of multimedia systems. Voice technology: synthesis, recognition and response. Student projects.
Prerequisite(s): COSC 2336
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5331 Image Processing 3 Credits
Department: College of Arts and Sciences
This is an introductory course in image processing that covers the basic theory, algorithms and applications.
Prerequisite(s): CPSC 336
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5340 Database Design 3 Credits
Department: College of Arts and Sciences
Introductory course on database design. It covers the architecture of database system organization; relational models; entity-relationship models; secondary storage; security issues and normal forms and decomposition theories. A course project is required.
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS, Satisfactory/Unsatisfactory

CPSC 5360 Software Engineering 3 Credits
Department: College of Arts and Sciences
Systems analysis, software requirements analysis and definition, specification techniques, software design methodologies, performance measurement, validation and verification and quality assurance techniques. Programming in an object oriented language.
Prerequisite(s): COSC 2336 and COSC 4302
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5361 Secure Software Engineering 3 Credits
Department: College of Arts and Sciences
This course covers five main secure software engineering topics such as security, defensive programming, reliability, program understandibility and programmer misconceptions.
Prerequisite(s)/Corequisite(s): CPSC 5360
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5363 Cybersecurity: Systems 3 Credits
Department: College of Arts and Sciences
This course provides a hands-on study of various attacks and defending techniques on computer software and hardware, including malware, OS security, web security, smartphone security and hardware security. Basics of C programming, OS and HTML will also be covered.
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5364 Wireless and Mobile Protocols 3 Credits
Department: College of Arts and Sciences
This course provides an overview of different wireless and mobile network protocols. It involves the study of the impact of wireless network characteristics on existing network protocols and newer protocols that are suited to such characteristics. Protocols for medium access control, routing, reliable transport and applications custom-made for wireless networks will be dealt with.
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5370 Artificial Intelligence 3 Credits
Department: College of Arts and Sciences
Introduction to concepts and ideas in artificial intelligence. Topics include search techniques, knowledge representation, control strategies and advanced problem-solving architecture.
Prerequisite(s): COSC 2336
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5375 Machine Learning 3 Credits
Department: College of Arts and Sciences
This course is an introduction to machine learning, the study of how to make a machine change its actions automatically to improve its performance. In addition, graduate students need to present a research paper.
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5380 3D modeling for Computer Graphics 3 Credits
Department: College of Arts and Sciences
This introductory course in three-dimensional (3D) modeling covers techniques for creating content designed for use in real-time computer graphics applications using appropriate software with particular emphasis on computer games. Topics include mathematical foundations, 3D file formats, creation and modification of 3D geometric shapes, surface texturing, lighting, rendering and a survey of current software tools and techniques.
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS

CPSC 5381 3D Animation for Computer Graphics 3 Credits
Department: College of Arts and Sciences
This introductory course in three-dimensional (3D) animation covers techniques for programming in C++ and creating content designed for use in real-time computer graphics applications using appropriate software with particular emphasis on computer games and character animation. Topics include rigid versus on-rigid body animation, skeletal techniques, morphing, kinematics, animation blending, key framing, time coding, motion capture, lip sync, synchronization methods, file formats and a survey of current software tools and techniques. It is recommended that CPSC 5380 be completed before taking this course
Restriction(s):
Undergraduate level students may **not** enroll.

Grade Mode(s): Standard Letter, Registrar do not use FN, Registrar do not use FS