Welcome to the Information Technology (IT) Program at Mizzou! Established in 2005, the IT program is home to more than 300 students studying a spectrum of traditional and cutting-edge industry topics. The program has two emphasis areas: (1) Software Engineering and Computer Management (mobile application development, computer programming, web development, networks and database management, system administration, cyber-security, and project management). (2) Media Technology and Post Production (media design, color engineering, digital production systems, digital effects and animation, virtual reality and game design).

The IT graduates have a great outlook in the job market. According to the Bureau of Labor Statistic list of Computer Information Technology Occupations, the median salaries in 2017 are $103,560 for Software Developers, $95,510 for Information Security Analyst, $88,270 for Computer Systems Analysts, $81,100 for Network and Computer Systems Administrators, $70,530 for Multimedia Artists and Animators, $67,990 for Web Developers, and $58,810 for Film and Video Post-Production specialists. Designed for the increasingly digital world, our IT program prepares students to pursue a variety of IT-related careers in programming, software engineering, database and system administration, video and audio post-production, digital effects and virtual reality, web developers, IT implementation specialists, and business analysts, both in the public and private sector. Equipped with marketable skills, most graduates in our IT program achieved roles in companies with high-pay jobs, some of whom had six-figure starting salaries. Additionally, the program provides well-trained IT workforce for Missouri and beyond.

The IT program offers rich curricula and student learning experience. In order to both offer traditional Information Technology competencies as well as emerging technologies and techniques, our courses are evaluated and created by the faculty in response to the evolving trends of the industry. These frequent updates allow our program to reflect the state of art developments each year. Our program offers some course sequences that are established in media technology, software programming, and security, etc. Some courses targeting cutting-edge technologies, such as cloud computing, virtual reality, and mobile App development are also offered. Many courses are offered online and in the summer. The teaching style of the IT program is highly hands-on, using experiential learning and challenge-based learning. The IT program also has a study-abroad program, with activities in both the summer and winter breaks. Our program offers both in-seat and online options, catering to the student's need and availability. The BSIT is offered entirely online for those seeking a distanced education.

The IT program is suitable to students with a wide range of background, including those students seeking to transfer from other degree programs, or community colleges. The IT Program also offers flexibility in career design, as we require fewer core course requirements than other programs, allowing the student to pick and choose a personalized selection of courses to tailor their career goals and areas of interest. In addition, the program offers a spectrum of collaborations, including a fast-track IT-MBA program with the Business School and a co-sponsored annual Reynolds Journalism Institute student competition, as well as numerous academic and social events by student organizations. Abundantly available and encouraged, students may seek research opportunities with faculty, and participate in internships for credit towards the program. Finally, the IT Program offers a number of both internal and external certificates, in software engineering, cyber-security, and media technology.

The IT program has distinguished faculty, who are highly trained and experts in their teaching areas, achieving various awards throughout their careers. The program has a number of IT-specific labs and classrooms, including Media and Software Development Lab and Classroom, Software Engineering Classroom, Networks and Securities Lab, Virtual Reality Lab, VR and AR Capture Facility, and Audio Engineering Lab and Studio. The program provides the very best experience for the future IT Professional, preparing them for the ever-changing technology-fueled world and industry.

Faculty

Assistant Professor of Practice: R. Bazan, C. Gubera, B. Maurer, N. Wergeles
Associate Teaching Professor: D. Musser*
Assistant Teaching Professor: F. Wang

* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

** Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

Undergraduate

- BS in Information Technology (http://catalog.missouri.edu/undergraduate/collegeofengineering/informationtechnology/bs-information-technology/)
- Minor in Information Technology (http://catalog.missouri.edu/undergraduate/collegeofengineering/informationtechnology/minor-information-technology/)

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This degree program is offered by the College of Engineering. Career opportunities include database administration, web design, cyber security, game development, film production, and more.

Graduate

While the College of Engineering does not offer a graduate degree specifically in Information Technology, it does offer a number of graduate degrees in closely related areas such as Computer Science (http://catalog.missouri.edu/undergraduate/collegeofengineering/computerscience/#graduatetext), and Computer Engineering (http://catalog.missouri.edu/undergraduate/...
There is a Master of Engineering degree through the department. The University also offers a number of information technology degrees in its other Colleges, and through interdisciplinary programs such as Health Informatics (http://catalog.missouri.edu/undergraduategraduate/interdisciplinaryacademicprograms/healthinformatics/#graduatetext), Health Administration (http://catalog.missouri.edu/undergraduategraduate/interdisciplinaryacademicprograms/mha-health-administration/), Informatics (http://catalog.missouri.edu/undergraduategraduate/interdisciplinaryacademicprograms/informatics/#graduatetext), or Information Science and Learning Technology (http://catalog.missouri.edu/undergraduategraduate/collegeofeducation/informationscienceandlearningtechnologies/#graduatetext).

A joint degree program administered through the School of Engineering and the Crosby MBA Program is available for students who wish to earn a Bachelor of Science in Information Technology (BS IT) and a Master of Business Administration (MBA) (http://catalog.missouri.edu/undergraduategraduate/collegeofbusiness/businessadministration/#graduatetext). Individuals interested in pursuing engineering and business will find that this program provides them with a valuable set of skills to excel in this rapidly growing field. If earned separately, the BS IT degree would take four years and the MBA degree would take two years. The dual degrees may be completed in five years assuming normal progress toward each degree.

Or you may browse a complete list of degree options (http://catalog.missouri.edu/degreesanddegreeprograms/) at the University of Missouri.

**INFOTC 1000: Introduction to Information Technology**
This course introduces the field of Information Technology including foundation experiences and knowledge, the history of digital technologies, emphasis areas in the program, career opportunities, and ethical/social issues. Students participate in activities that introduce students to digital media, digital systems, and software engineering. Students learn to use distributed version control systems and how to work on collaborative teams.

**Credit Hours:** 3

**INFOTC 1001: Topics in Information Technology**
Topics may vary from semester to semester. May be repeated upon consent of department.

**Credit Hours:** 3

**INFOTC 1040: Introduction to Problem Solving and Programming**
An introduction to problem solving methods and programming concepts, providing experience in designing, developing, implementing, and testing programs. Cannot be taken for credit after CMP_SC 1050.

**Credit Hours:** 3

**INFOTC 1600: Digital Systems**
This course provides a foundation of knowledge of digital systems including terminology, concepts, architecture, processes, tools, hardware, and software.

**Credit Hours:** 3

**INFOTC 1610: Introduction to Digital Media Design**
This project-based course is an introduction to the concepts and practices of audio design, graphic design, motion media design and basic video editing. Current technologies are employed to examine design fundamentals and applications of media design that apply to audio and video production and new media production.

**Credit Hours:** 3

**INFOTC 2001: Topics in Information Technology**
Topics may vary from semester to semester. May be repeated upon consent of department.

**Credit Hours:** 3

**INFOTC 2040: Programming Languages and Paradigms**
This course presents programming principles and their syntactical representation and implementation across languages including those that are compiled and interpreted. The course shows how to implement algorithms and data structures to solve problems while utilizing paradigms offered by the programming languages such as procedural, object-oriented, protocol-oriented, functional, and declarative. Language support for strong and weak typing and type safety are covered along with support for optional values. Provides experience in developing algorithms and determining their efficiency, designing application architecture, and developing applications. Building and using libraries/ application programming interfaces is covered. Git and GitHub are used for code versioning and collaboration. Integrated development environments (IDEs) are used for managing, building, debugging, and testing applications.

**Credit Hours:** 3

**Prerequisites:** INFOTC 1040 or CMP_SC 1050, or prior experience with programming and consent of instructor

**INFOTC 2610: Digital Media Design I**
This project-based course examines the fundamentals of media technology, from capture devices to the software and hardware that processes data. Through hands-on experience with capturing technology, audio recording devices, and the software and hardware components needed to manipulate the recordings, students will process big-data files to create meaningful manipulations in assembly, engineering, and colorization. Students will utilize a spectrum of camera equipment, recording devices and facilities to achieve an understanding of audio/video capture, project planning and implementation, hardware assessment, optimization practices through hardware acceleration, and video processing. This course also focuses on basic editing theory and industry trends. This is done through in-class demonstrations, online modules, and supplementary material hosted on online.

**Credit Hours:** 3

**Prerequisites:** C- or higher in INFOTC 1610 or FILMS_VS 1880 or DST_VS 1880, or instructor content through course equivalencies

**INFOTC 2615: Color Processing and Design**
This course is an intensive study of the techniques, software, principles, technology, data management practices, sciences, problems and theories of color processing for video in media. The course will prepare students for work in industries related to color processing and delivery, while providing further enrichment to technology related to media.
production, including camera and sensor science, computer hardware, and peripherals. Graded on A-F basis only.

Credit Hours: 3

INFOTC 2620: Computer Modeling and Animation I
Introduction to the field of computer modeling and animation with an emphasis on tools. Learn programming methods for developing customized modeling and animation algorithms. Graded on A-F basis only.

Credit Hours: 3

INFOTC 2630: Introduction to Game Theory and Design
Students will develop foundational skills in game design and theory, and become proficient in the tools used to develop conceptual gaming environments. The student will develop skills to discuss, develop, and demonstrate the design process in cooperation with current game theories and practices. The student will develop collaborative and cooperative design techniques mirroring that of the industry. Graded on A-F basis only.

Credit Hours: 3

INFOTC 2810: Fundamentals of Network Technology
This course includes an overview of networking and the common wireless standards. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: INFOTC 1040 or CMP_SC 2050 with C- or higher

INFOTC 2830: Web Application Development I
(same as CMP_SC 2830). This course will attempt to provide a comprehensive understanding of the evolution, the technologies, and the tools of the Internet. In particular, issues pertaining to the World Wide Web and Multimedia (HTML, CGI, Web based applications) will be discussed in detail.

Credit Hours: 3
Prerequisites: INFOTC 2040 or CMP_SC 2050 with C- or higher

INFOTC 2910: Cyber Security
This course covers numerous platform-independent security topics including threats, problem ports and services, theory and practice of defense in security, intrusion detection, data security, securing remote access, user education and support, designing a secure network and security management. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: INFOTC 1040 or CMP_SC 2050 with a C- or higher

INFOTC 3300: Object Oriented Programming
(same as CMP_SC 3330). This course focuses on object-oriented programming concepts such as: Abstraction, Polymorphism, Encapsulation, Inheritance, Interfaces, Abstract Classes, Files, Streams, and Object Serialization. Topics such as GUI and event-driven programming, APIs, and design patterns are also tackled. Java SE 8, NetBeans 8 IDE, and JavaFX Scene Builder 2.0 are used to build Java SE applications that include user interfaces developed using JavaFX. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: INFOTC 2040 or CMP_SC 2050 with C- or higher

INFOTC 3380: Database Systems and Applications
This course covers database management systems (DBMS) and the development of applications that utilize databases including relational/SQL and NoSQL types. Topics include the evolution of data storage and databases, data modeling, relational and NoSQL databases, SQL, document, graph and key-value storage and retrieval, application development using databases, database scaling, database trends, and popular database systems. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: C- or higher in CMP_SC 2050 or INFOTC 2040; or experience developing applications and permission of the instructor

INFOTC 3530: UNIX Operating System
(same as CMP_SC 3530). This course is an introduction to UNIX and UNIX-like operating systems and interfaces, to include the file system, command shells, text editors, pipes and filters, input/output system, shell scripting and Regular Expressions. The course will also incorporate an aspect of programming in a UNIX environment, cloud computing, containers and an introduction to System Administration. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: INFOTC 2040, or CMP_SC 2050, or Instructor Consent

INFOTC 3600: User Experience Design I
This course is a first in a series that focuses on User Experience (UX) Design for software applications. This course introduces the beginner to processes, techniques and methods of evaluation to design, model and evaluate application designs and user interfaces.

Credit Hours: 3
Prerequisites: May be restricted to Information Technology majors during early registration

INFOTC 3610: Digital Media Design II
This project-based course builds upon the fundamentals of production and media processing learned in INFOTC 2610 and introduces industry standard advanced video and audio capture technology, software, and data management systems. The course is designed to provide further hands-on experience with digital video capturing technology, non-linear editing software, Digital Audio Workstations, and broadcast technology through three large-scale collaborative media projects. These projects build upon the principles of data management and software, while introducing project management, team management, and direct-to-market media strategies. Students will utilize a spectrum of industry standard camera equipment, recording devices and facilities to achieve a fuller understanding of audio/video capture and post production.

Credit Hours: 3
Prerequisites: C- or higher in INFOTC 2610. Instructor consent with approved equivalencies
INFOTC 3620: Computer Modeling and Animation II
This course covers advanced methods for modeling and animation with
an emphasis on computer science theory and virtual reality. Graded on A-
F basis only.
Credit Hours: 3
Prerequisites: C- or higher in INFOTC 2620

INFOTC 3630: Introduction to Virtual Reality
The course will provide students with a good understanding of the
fundamentals of virtual reality and practical hands on VR experience
development skills. It will introduce students to the software, hardware,
and concepts involved with the current state of the art in virtual reality.
This course will focus on using the recent consumer-grade equipment
to design and construct virtual environment and experience.
Credit Hours: 3
Prerequisites: INFOTC 1040 or CMP_SC 1050 with C- or higher

INFOTC 3640: Motion Graphics and Visual Effects I
This advanced media creation course is an introduction to the
fundamentals of motion graphic design, 2-D animation, and visual effects
creation. It is a project based course that requires understanding of
NLEs, experience in media creation and design, understanding of basic
audio/video compression, and understanding of basic media design
and concepts. Computer programs designed for graphic design, motion
graphics, 2-D animation, and visual effects are integrated throughout the
course. Starting media will be provided for each project.
Credit Hours: 3
Prerequisites: C- or higher in INFOTC 1610

INFOTC 3650: Project and Team Management
This course focuses on the business analysis, development tools,
communication skills, and management techniques required to
successfully lead personnel, meet deadlines, and create digital media
projects in today's media production industry. May be taken as Writing
Intensive.
Credit Hours: 3
Prerequisites: C- or higher in INFOTC 1610 or FILMS_VS 1880 or
DST_VS 1880

INFOTC 3650W: Project and Team Management - Writing Intensive
This course focuses on the business analysis, development tools,
communication skills, and management techniques required to
successfully lead personnel, meet deadlines, and create digital media
projects in today's media production industry.
Credit Hours: 3
Prerequisites: C- or higher in INFOTC 1610 or FILMS_VS 1880 or
DST_VS 1880

INFOTC 3660: Audio Engineering
This course is an intensive study of the techniques and art behind the
use of audio in today's media design environments. From the theater to
television, from tablet and mobile device to computer, this course will
focus on the four major sound design areas: sound in cinema, sound
creation, sound manipulation, and environmental sound layering.
Credit Hours: 3
Prerequisites: May be restricted to Information Technology majors
during early registration
INFOTC 4001W: Topics in Information Technology - Writing Intensive
Topics may vary from semester to semester. May be repeated upon consent of department. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: May be restricted to Information Technology majors during early registration

INFOTC 4085: Independent Projects
A student interested in doing an independent study project should first choose an area and instructor to work with. The student and instructor decide on a suitable Information Technology topic. The student writes up a detailed description of the project, including references, deadlines and deliverables. The instructor and student decide on details for completing the project during the semester for a grade.

Credit Hours: 3
Prerequisites: Consent of instructor

INFOTC 4320: Software Engineering
Software Engineering covers the principles, processes, and professional practices used to design, develop, test, deploy, and manage software systems in a team-based, collaborative environment. A range of software engineering methodologies are covered with an emphasis on agile software development using incremental methods of managing the development activities.

Credit Hours: 3
Prerequisites: INFOTC 2040 or CMP_SC 2050 or permission of the instructor

INFOTC 4390: Database Administration
This course is designed to give a firm foundation in Database Administrators' tasks. The primary goal is to give necessary knowledge and skills to setup, maintain and troubleshoot an Oracle database. This is an instructor-led course featuring lecture and hands-on exercises. Online demonstration and written practice sessions reinforce the concepts and skills introduced. The course defined objectives are designed to support preparation for the Oracle Certified Professional examination.

Credit Hours: 3
Prerequisites: CMP_SC 4380

INFOTC 4400: C#/.NET Development
Learn how to develop and debug multi-threaded Windows desktop applications based on the object-oriented (OO), Model-View-Controller (MVC), and Model View ViewModel (MVVM) paradigms using C#, .NET, Windows Presentation Foundations (WPF), and Visual Studio. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: INFOTC 2040 or CMP_SC 2050

INFOTC 4405: iOS App Development I
(same as CMP_SC 4405). This is a first in a series of courses on developing iOS applications using Xcode, and the Swift programming language on the macOS platform.

Credit Hours: 3
Prerequisites: INFOTC 1040 or CMP_SC 1050, or consent of instructor

Recommended: Prior experience programming in any programming language. The student should understand basic language concepts such as variables, data structures, control structures, and functions

INFOTC 4410: Android App Development I
This is the first in a series of courses on developing Android applications using Android Studio and the Java and Kotlin programming languages.

Credit Hours: 3
Prerequisites: INFOTC 1040 or CMP_SC 1050, or consent of instructor

INFOTC 4420: Android App Development II
This is the second course in a series on developing Android applications using Android Studio and the Java and Kotlin programming languages. This course covers intermediate-level topics in application design, more complex UI implementations, and data persistence.

Credit Hours: 3
Prerequisites: INFOTC 4410, or consent of instructor

INFOTC 4425: iOS App Development II
This is the second in a series of courses on developing iOS applications using Xcode and Swift programming language on the macOS platform. This course covers intermediate-level topics in application design, more complex UI implementations, and data persistence.

Credit Hours: 3
Prerequisites: INFOTC 4405 with C- or higher

INFOTC 4440: Android App Development III
This is the second course in a series on developing Android applications using Android Studio and the Java and Kotlin programming languages. This course covers intermediate-level topics in application design, more complex UI implementations, and data persistence.

Credit Hours: 3
Prerequisites: INFOTC 4420 or permission of the instructor

INFOTC 4445: iOS App Development III
This is the third in a series of courses on developing iOS applications using Xcode and Swift programming language on the macOS platform. This course covers intermediate-level topics in application architecture, application design, data persistence, and client-server architecture.

Credit Hours: 3
Prerequisites: INFOTC 4425

INFOTC 4450: Team-Based Mobile Device Application Development
This is a multi-disciplinary, team-based course on developing applications for mobile devices. Teams will be comprised of students who are software developers and students who are designers. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: INFOTC 2040; or CMP_SC 2050; or permission of instructor with applicable experience

INFOTC 4460: User Experience Design II
This course is the second in a series that focuses on User Experience (UX) Design for software applications. This course further develops the
processes, techniques and methods of evaluation to design, model, and evaluate application designs and user interfaces.

**Credit Hours:** 3
**Prerequisites:** INFOTC 1600

**INFOTC 4610: Advanced Multimedia Design and Technology**

Students enrolled in INFOTC 4610 are immersed in upper level study of media technology, software, and trends in the industry, with focus on advanced media design, motion media capture techniques, portfolio development, and industry standard technology and software. Students will work both independently and in small focus groups to produce industry results in narrative, non-fiction, and commercial media design projects. This course may be taken as INFOTC 4610W for WI credit. If IT majors take this course as WI, it will serve as Capstone. This is a Study Abroad course.

**Credit Hours:** 3
**Prerequisites:** IT Majors must complete INFOTC 2610; other majors may seek instructor consent

**INFOTC 4610W: Advanced Multimedia Design and Technology - Writing Intensive**

Students enrolled in INFOTC 4610 are immersed in upper level study of media technology, software, and trends in the industry, with focus on advanced media design, motion media capture techniques, portfolio development, and industry standard technology and software. Students will work both independently and in small focus groups to produce industry results in narrative, non-fiction, and commercial media design projects. This course may be taken as INFOTC 4610W for WI credit. If IT majors take this course as WI, it will serve as Capstone. This is a Study Abroad course.

**Credit Hours:** 3
**Prerequisites:** IT Majors must complete INFOTC 2610; other majors may seek instructor consent

**INFOTC 4630: Game Development**

(same as CMP_SC 4630). The course focuses on rapid game prototyping and development utilizing the Unity game engine and C#. You will learn the fundamentals of game programming and also a platform which is actually used to make published games across multiple platforms (Mac, PC, web, iOS, Android etc). Graded on A-F basis only.

**Credit Hours:** 3
**Prerequisites:** INFOTC 3630 or CMP_SC 2050 or INFOTC 2040 with C- or higher

**INFOTC 4640: Motion Graphics and Visual Effects II**

This course builds on fundamentals of digital motion picture effects technology learned in Digital Effects I. Computer programs designed for digital visual special effects in film and broadcast are integrated throughout the course.

**Credit Hours:** 3
**Prerequisites:** C- or higher in INFOTC 3640

**INFOTC 4650: Shader Programing**

The focus of this course is modern computer graphics algorithms and programming, with an emphasis on games, shader languages, (GLSL and Cg) and Graphical Processor Units (GPUs).

**Credit Hours:** 3
**Prerequisites:** CMP_SC 2050, INFOTC 2620

**INFOTC 4830: Web Application Development II**

(same as CMP_SC 4830; cross-leveled with CMP_SC 7830). This course will study the science and engineering of the World Wide Web. We will study the languages, protocols, services and tools that enable the web. Emphasis will be placed on basics and technologies.

**Credit Hours:** 3
**Prerequisites:** CMP_SC 2830 with a C- or higher

**INFOTC 4910: Digital Forensics**

(same as CMP_SC 4910). This course introduces an overview of basic Digital Forensics procedures and techniques to enable students to perform a digital investigation of physical storage media and volume analysis, including preservation, analysis and acquisition of artifacts that resides in hard disk and random access memory, for Linux and Windows systems. Work is completed in Unix/Linux environments and in Microsoft Windows environment. Students will need to setup a virtual private infrastructure to perform multiple tasks. The course emphasizes ‘learning by doing’ and has a 90% hands-on and 10% theory. Much of this information consists of skills and abilities that employers want and expect in the real world of IT - in a small to medium size organization. Graded on A-F basis only.

**Credit Hours:** 3
**Prerequisites:** INFOTC 2910 and INFOTC 3910

**INFOTC 4970W: Senior Capstone Design - Writing Intensive**

This course is an opportunity for you to demonstrate that you have achieved the goals established by the Information Technology (IT) program. You will do this through a series of writing exercises, class activities, and a team-based project. You will demonstrate your ability to synthesize various methods and skills, apply them to new, novel, complex, and integrated project requirements in real-world IT problems. Graded on A-F basis only.

**Credit Hours:** 3
**Prerequisites:** C- or higher in INFOTC 4320, or CMP_SC 4320, or CMP_SC 2830 with a C- or higher

**INFOTC 4990: Undergraduate Research in Information Technology**

Research topics as defined by instructor and student.

**Credit Hour:** 1-6
**Prerequisites:** Instructor's consent

**INFOTC 4995: Undergraduate Research in Information Technology - Honors**

Research topics as defined by instructor and student.

**Credit Hour:** 1-6
**Prerequisites:** Instructor's consent