# UNION UNIVERSITY

## DEPARTMENT *of* COMPUTER SCIENCE

RELIGIO ET ERUDITIO

The department offers four plans of study: (uu.edu/academics/coas/compscience/)

## Computer Science Major

Upon completion of the Computer Science major, the student will have an understanding of and an appreciation for the interrelation of the five main areas of study in Computer Science: elements and architecture, programming concepts and languages, algorithms, data structures, and computer theory. The major emphasizes the practical application of basic concepts from each; therefore, the graduate will be able to continue study in Computer Science at the graduate level, or enter the job market.

## Information Technology Major

The Information Technology Major is an alternative to the Computer Science major. Whereas the latter is more theoretical in nature, Information Technology is more practical and includes organizational issues and information systems. It deals more with soft skills and has fewer math prerequisites. IT is a new and rapidly growing field that started as a grassroots response to the practical, everyday needs of business and other organizations. IT programs exist to produce graduates who possess the right combination of knowledge and practical, hands-on expertise to take care of both an organization's information technology infrastructure and the people who use it.

## Digital Media Studies Major

The Digital Media Studies major is an interdisciplinary program joining Art, Communication Arts, and Computer Science. Its purpose is to produce a student aesthetically, theoretically, and technologically trained and capable of excellence in the relatively new area of the design, production, and implementation of digital communications media. Included are such areas as web page design, digital visual and aural communications strategies and theory, interactive media design, media programming, digital presentation techniques, and technological advances in digital communications.

## Computer Information Systems Minor

The Computer Information Systems minor will provide the student with a general understanding of analysis, design, and implementation of applications via third-and-fourth-generation programming languages and pre-written packages. This minor is intended for the student expecting to use computers in a job-supportive mode.

## Faculty

**Stephanie Edge**, Associate Professor of Computer Science, teaches Survey of Microcomputing Applications, Computer Science: Introduction and Overview, Programming in Java, and Algorithms and Data Structures. Her areas of interests include: computer hardware, web development, and programming languages.

**Dr. Jim Kirk**, Associate Professor of Computer Science, teaches Digital Systems, Computer Architecture, Computer Graphics, Video Game Design, and Senior Seminar. His research interests center upon machine learning, particularly distributed artificial intelligence (neural networks) and genetic algorithms.

**Dr. Max Haifei Li**, Associate Professor of Computer Science, teaches Survey of Microcomputing Applications, Database Management Systems, Computer Ethics, and Programming Languages. His research interests include electronic commerce, automated business negotiation, business process management, web services and enterprise computing.

**Cam Tracy**, Web Development Agent, teaches Web Building and Site Management, Computer Mediated Communication, and Web Applications. Research interests include database design and web application development.

**Dr. G. Jan Wilms**, Professor of Computer Science and Department Chair, teaches mostly upper-level classes including Operating Systems, and Networking.

He is currently spearheading a class on information security and mobile device programming. His research interests are augmented reality and mobile device programming.

## Selected Graduate Biographies

**Mikias Seid** (2010): PureSafety, Nashville, TN

**Daniel Harwell** (2010): Technician, Jackson Madison County Schools, Jackson, TN

**Daniel Laughlin** (2010): Graduate school in Computer Science, University of Memphis

**Toyin Adedokun** (2010): Web Developer, Younger Associates Advertising Division

**Jacob White** (2010): Graduate school in Computer Science, Wake Forest University

**Hani Nyabam** (2010): Programmer, Logical Systems Inc. LSI, Jackson, TN

**Matt Stimmel** (2009): Application Designer, Belvedere Training, Chicago, IL

**Matt White** (2009): Software Engineer, Cerner Corporation, Kansas City, MO

**Jacob Lynn** (2009): Field Technician, Pomeroy IT Solutions, Columbus, OH

**Luke Pinion** (2009): Business/Database Analyst, Global Client Solutions, Tulsa, OK

**Ben Goodwin** (2007): Perl Programmer, Transformations, Inc.

**Kendal Hershberger** (2007): Software Engineer, Garmin International, Inc., Kansas City, MO

**Dustin Martin** (2007): Web Applications Developer, Kroger, Louisville, KY

**Jeremy Cathey** (2007): Owner, Professional IT Management, Jackson, TN

**Andrew Skaggs** (2006): Information Technology Manager, Davidson Titles, Jackson, TN

**Crystal Gibson** (2006): Information Systems Specialist, Housing Authority, Paducah, KY

**Phylis Anyango** (2005): E-Commerce/Software Testing Specialist/EDI Administrator, Pictsweet, Bells, TN

Kevin Hieb (2005): Quality assurance, Aprimo, Indianapolis, IN

Willie George (2005): Mac Lab Coordinator / PC Support Specialist, Information Technology, Jackson TN

Ryan Gillespie (2005): Network Engineer, ISG Technology, St. Louis, MO

Milan Zivkovic (2005): Financial Analyst, Spheris, Franklin, TN

Daniel Green (2004): Financial Services Analyst, Ingram Book Company, LaVergne, TN

Allen Smith (2004): Mac Development, Wacom Digitizers, Driver Development, WA

Barry Britt (2003): Systems Analyst II, Iowa State University, Ames, IA

Robert Rickett (2003): Client Systems Administrator, Wabtec (WAB), Jackson, TN

Amy Miller Heckman (2003): Assistant Director of Research and Technology, Tennessee Independent Colleges and Universities Association, Nashville, TN

Travis Wales (2002): Manager of Field Operations, ENA (Education Networks of America), White Bluff, TN

Aaron Hardee (2000): IT Quality Assurance Manager, Sedgwick CMS, Lakeland, TN

Alicia Hite Bender (2000): Senior Programmer Analyst, Nash Finch Company, Maple Grove, MN

Keeley Woods Shaidnagle (2000): Director of Purchasing Systems, Mid-America Apartment Communities, Olive Branch, MS

## Talking Points

Job prospects:

o IT holds 4 spots in the top 30 according to a January 2010 study of CareerCast. com, which evaluates 200 professions to determine the best and worst according to five criteria inherent to every job: environment, income, employment outlook, physical demands and stress. Continuing a recent trend, a majority of the jobs that rank in the top 10 this year require proficiency in math, science or technology, and all of them require higher education or specialized training: Software Engineer (1), Computer System Analyst (5), Technical Writer, and Programmer. SE's success can be attributed to two emerging industries: web applications and cloud computing.

o According to the 2011 Job Outlook of the National Association of Colleges and Employers, Computer Science is the 2nd in the list of top-paying bachelor's degrees (Average Salary Offer is $63,017. The average salary offer went up 7.8% from the previous year). In the top-10 of Bachelor's Degree in demand, Computer Science is #2, Computer Engineering #7, Information Sciences & Systems #9, and networking/telecommunications #10.

o 3 of the top 4 professions according to the latest Jobs Rated Almanac are computer science related: website manager (1st), computer-systems analyst (3rd) and software manager (4th).

o According to an April 2006 article in Information Week, IT employment in the US reached a record high of 3,472 million workers, with unemployment at the lowest level since the end of 2000.

o The Bureau of Labor Statistics 10-year outlook report released in 2004 estimates that the professional-level IT workforce will grow at more than twice the rate of the overall workforce, creating 1 in 19 new jobs (a little over a million new jobs). Six of the 30 occupations that are projected to grow the fastest are in the IT profession, all 6 with median salary earnings of $43,605 or above: network analyst (2nd), application software engineers (5th), system software engineers (8th), network/system administrator (11th), database administrator (12th), systems analyst (25th).

o Money Magazine in 2006 lists software engineer as the first in the top 50 jobs, with a 10-year growth forecast of 46% and an average pay of $80,427. Computer Analyst is 7th, with 36,1% growth and salary of $83,427.

o A sampling of companies where some of our recent graduates have been employed includes FedEx, Ford, Hewlett Packard, AutoZone, Watcom, Garmin, eBay and ScanSoft.

o The department has a dedicated classroom lab with 16 state-of-the-art machines, and free Microsoft server & programming software for majors through MSDN Academic Alliance. VMware licenses are also available to students. A second dedicated classroom is reserved for hardware-related classes.

o The department received an equipment grant from Cisco for networking devices worth over $15,000.

o The department offers several classes that prepare students to take industry certification exams, such as computer repair (A+), Network+, Linux+, and forensics.

o Many of our courses are web-enhanced using the Blackboard Course Management System, and take advantage of the in-house developed student response system QuizMaster.

o The department has a study-abroad agreement with the KUL University in Belgium through their Junior Program in European Culture and Society.

o Students are taking advantage of internships for academic credit during the summer before their senior year.

o All majors work on a service-based project in the senior seminar class which helps the community and showcases their talents to future employers. Examples include an expert system for nursing education, a campus kiosk, and web sites for local churches.

o The department jointly offers the Digital Media Studies major with Art and Communication Arts - this is an exciting emerging field which is available in only a handful of universities. A new course just added is programming for mobile devices.

o A second major (IT) has just been approved as an alternative to Computer Science, with more of an emphasis on soft-skills and less on hardware and math skills.

o A new elective course being offered is on Ethical Hacking and Computer Forensics.

o The department uses the Lego Mindstorms Robotics Systems to introduce the students to algorithm development.

o Special projects are developed regularly to help students integrate and apply what they have learned in various classes. Recently, students have retrofitted an old arcade game with modern computer parts and software. Computer Repair and Maintenance students shopped for parts and constructed the computer system, Computer Graphics students designed and programmed a 3D interactive virtual world to run on the system, and a Senior Seminar student designed the user interface and supervised much of the process. Another exciting project involves game design for the XBox 360.

o One of the department's professor holds a patent from his time as a software engineer at IBM: US Patent: 7,313,533, Approved on December 25, 2007, deals with Service Level Agreements in e-commerce.

o One of our graduates has written Bricksmith, a very popular Lego CAD program for the Macintosh.

o Union University Chapter of ACM (Association for Computing Machinery) has sponsored campus-wide services to repair and maintain computers for both students and faculty/staff.