

Information Communication Technology

College of Communication & Information

Master of Science

Our Information Communication Technology program strives to educate students to assume roles where the application of information technology (IT) is concerned with the ultimate goal of connecting people, organizations, and communities to enhance their ability to succeed. This master's program focuses on providing students with the knowledge and skills to assume leadership positions charged with effectively applying, using, and managing technology when solving problems specifically related to information and communication. It provides a human and organizational focus on technology – teaching students how to be effective users of technology. In general, the ICT program focuses on the intersection of technology, the people who use that technology, the policies and regulations governing or affecting use of that technology, and the community or environment in which that technology is used, in order to facilitate communicating information in meaningful ways.

Admission Requirements

Students are admitted for fall and spring semesters. Application deadlines are July 15 for fall admission and November 15 for spring admission. Students pursuing the degree will apply to the Graduate School for admission to the ICT MS degree program. There is no preferred undergraduate degree program. Admission to the ICT MS degree program requires 1) a bachelor's degree from an accredited institution; 2) a grade point average of 3.0 or higher on any prior undergraduate or graduate work, in both cases on a scale with A = 4.0; and 3) Graduate Record Exam scores, verbal: new exam 150 or higher OR old exam 400 or higher; quantitative: new exam 140 or higher OR old exam 450 or higher, and analytical writing 4.0 or higher. For the quantitative and analytical scores, applicants should meet at least one of the minimum scores. Applicants for whom English is not the native language must achieve a TOEFL score of 550 for the paper-based test (213 for computer-based test or 79 for the internet-based test). Students may take 500-level undergraduate courses, with the advice of faculty or staff, to remedy any deficiencies.

Degree Requirements

The ICT master's degree program requires successful completion of 36 hours, including 15 hours of required core classes. With the faculty advisor's prior approval, as many as 6 elective hours may be taken in a cognate area of study. Students pursuing the ICT master's will submit a research proposal in the form of a written paper and visual presentation as their Exit Requirement. Students will identify an ICT-related problem space, research current options, propose a new solution, and provide reasoning and evidence that supports the new solution. The project may be new, or it may be an extension to a project started during a student's internship, as long as the student substantially expands what they did during the internship.

Course Descriptions

ICT 550 SECURITY INFORMATICS. (3)

This course introduces students to policy concerns relating to security informatics, and highlights theoretical and practical approaches to designing secure information and communication technology (ICT) systems. It addresses key issues such as authentication, risk analysis, access control, database and network security, and information assurance.

ICT 552 CYBERCRIME AND DIGITAL LAW ENFORCEMENT. (3)

The global reach of the Internet, the low marginal cost of online activity, and the relative anonymity of users have contributed to a wide escalation in cybercrimes. Consequently, information and

communications technologies (ICT) are being increasingly employed to instigate threats to global civil society. This course provides an overview of cybercrime and the digital law enforcement practices put in place to respond to them. The course will focus on the types and extent of current cybercrimes, how the justice system responds to these crimes, the various constitutional protections afforded to computer users, the law and policies that govern cybercrime detection and prosecution, and related technologies.

ICT 596 INTERNSHIP IN ITC. (3)

Provides students with supervised work-and-learning experience in a professional environment under the direction of a University faculty member and an employee of a participating firm. One hundred forty four (144) hours of student time are expected during the semester. Enrollment is contingent upon the availability of internships. Students are selected on the basis of personal qualifications, including GPA, courses taken, recommendations, and an interview.

ICT 600 INFORMATION COMMUNICATION TECHNOLOGY IN SOCIETY. (3)

We live in a world of rapid technological innovation. This innovation has allowed significant changes in the ways that we communicate and interact with forms of media. In fact, the technologies related to communication have created a culture surrounding how we see, hear, read and use information, and have significantly impacted politics, economics, policy, etc. This course studies the impacts of information and communication technology (ICT) on individuals and society, and the impact that society has on ICTs. It examines current issues related to the diffusion of new technologies in society as well as the obstacles to widespread use of individual ICTs. Students in this course will analyze the various theories related to the use of emerging communications forms, and consider the factors related to successful ICT deployment. Students will be required to look beyond “good/bad” classification of new communication technology, and conduct in-depth interrogations of ICTs, the issues that surround them and the environments in which ICTs are used.

ICT 601 INFORMATION SEEKING. (3)

This course provides an overview of the theory and practices of human information seeking behavior, including both basic models to understand user behavior, and techniques to effectively select, locate, evaluate, and use information to meet diverse information needs and facilitate human-computer interaction.

ICT 605 INTRODUCTION TO HUMAN COMPUTER INTERACTION. (3)

Human computer interaction (HCI) is an interdisciplinary field in which computer scientists, engineers, psychologists, social scientists, and design professionals play important roles. The goal of HCI is to solve real problems in the design and use of technology, making computerbased systems easier to use and more effective for people and organizations. Ease of use and effectiveness are critical to the success of any systems that interact with people, including software systems, home, office and factory appliances, and web and phone applications. This course provides an overview and introduction to the field of human-computer interaction, with a focus on how it applies to managers, technology executives, and others who will work with HCI professionals. Particular emphasis will be placed on what HCI methods and HCI-trained specialists can bring to design and development teams. The course will introduce students to proven tools and techniques for creating and improving user interfaces, such as Participatory Design, HCI for Development, Contextual Inquiry, and Think-Aloud User Testing. Students at the end of the course will have learned some useful techniques and an understanding of systematic procedures for creating usable and useful designs and systems.

ICT 610 ICT RESEARCH METHODS. (3)

Information and Communication Technologies (ICTs) are pervasive in our increasingly global society and, importantly, have the potential to improve lives and society. This course is designed to provide you

with a sophisticated understanding of the philosophy, theory, design, and analysis of both qualitative and quantitative research in communication. During this course you will be exposed to a variety of methodological designs and statistical procedures to allow you to complete your own research projects during your time as a graduate student here at the University of Kentucky. Using a variety of methods ranging from the foundational (e.g., interviews, surveys) to cutting edge (e.g., big data analysis, geospatial mapping) and readings from a variety of contexts (e.g., education, healthcare, risk and crisis), this course is designed to equip you with the research and methodological tools to understand how ICTs affect individuals, relationships, groups, organizations, social movements, and policies and to use these methodological tools in applied settings.

ICT 626 ELECTRONIC INFORMATION RESOURCES IN THE HEALTH SCIENCES. (3)

Survey of electronic information resources in the health sciences, including databases and Web sources. Discussion of relevant controlled vocabularies and their use in formulating and executing search strategies. The course also includes an evidence based health care component whereby students learn to analyze critically the biomedical literature and determine reference and research relevancy. (Same as LIS 626.)

ICT 627 CONSUMER HEALTH INFORMATION RESOURCES. (3)

History and development of consumer health information resources; role of professional and governmental agencies in provision of consumer health information; policy issues related to provision of consumer health information. Consumer health professional literature, user information needs, user resources, and information services. Identification, selection, utilization, and evaluation of consumer health information for special populations within specialized educational and healthcare settings. Trends and issues in consumer health informatics. (Same as LIS 627.)

ICT 630 INFORMATION RETRIEVAL. (3)

This course reviews important information retrieval (IR) theories and models; explores a brief history of IR research; and examines various IR applications. Students will get familiar with IR foundations such as document indexing or query expansion/optimization strategies, as well as understand overall system architectures for selected IR applications. Students will explore how to analyze and compare IR systems, how to select the best IR systems for particular tasks and how to design a prototype for an efficient IR system. Prereq or concur: LIS 636 or LIS 637 or LIS 638. (Same as LIS 630.)

ICT 636 INTRODUCTION TO COMPUTER INFORMATION SYSTEMS. (3)

A broad introduction to the use of computers as tools for creativity, communications, organizing information, and problem-solving. The basic concepts of computer hardware, software, networking, and the Internet are covered. Students also will be introduced to basic techniques for designing and creating a web site.

ICT 638 ADVANCED WEB DESIGN. (3)

This course serves as a hands-on introduction to advanced web design techniques. Topics include the web development process, creating dynamic content, advanced layout and design, client-side and server-side scripting languages, graphic file types and optimization, web forms, multimedia, and web servers and databases. Prereq: ICT 636, or consent of instructor.

ICT 640 HEALTH INFORMATION RESOURCE SERVICES. (3)

A survey of information agencies and health science libraries, including topics related to: the healthcare community and their information needs, information resources in the health sciences, controlled medical terminologies and classification systems, search and retrieval of information resources, issues in the management of collections and access to health libraries. (Same as CI/LIS 640.)

ICT 650 INTRODUCTION TO LEADERSHIP IN INFORMATION PROFESSIONS. (3)

The primary purpose of this course is to expose students to leadership strategies and challenges in the information professions. Primary attention is placed on: 1) the role of communication in effective leadership; 2) innovation and change in the information professions and the leadership styles available for addressing such changes; 3) ethical frameworks in communication leadership; 4) issues management and organizational planning; and 5) leadership communication strategies for managing conflict and crises. Prereq: Graduate student status in the ICT, LIS, or CJT graduate programs.

ICT 651 TECHNOLOGY SECURITY. (3)

An introduction to information security including vocabulary and terminology, threats to information systems, cryptology, ethics, the legal environment, and risk management. Identification of exposures and vulnerabilities and appropriate countermeasures are addressed. The importance of appropriate planning, policies and controls is also discussed. It is expected that each student will possess some knowledge of programming, operating systems, and networking, although advanced knowledge in those areas is not necessary.

ICT 658 KNOWLEDGE MANAGEMENT. (3)

Organizational knowledge is a valuable strategic asset. Knowledge management refers to the systematic management of an organization's knowledge assets so that they can be leveraged for sustainable advantage. This course examines how knowledge is created, captured, organized, diffused, and implemented in an organization. Topics covered include knowledge management processes and practices, corresponding technologies, collaboration tools, and people and cultural issues. (Same as LIS 658.)

ICT 661 INTRODUCTION TO DATA SCIENCE. (3)

This course will provide a foundation in the area of data science based on data curation and statistical analysis. The primary goal of this course is for students to learn data analysis concepts and techniques that facilitate making decisions from a rich data set. Students will investigate data concepts, metadata creation and interpretation, general linear method, cluster analysis, and basics of information visualization. At the beginning, this course will introduce fundamentals about data and data standards and methods for organizing, curating, and preserving data for reuse. Then, we will focus on the inferential statistics: drawing conclusions and making decisions from data. This course will help students understand how to use data analysis tools, and especially, provide an opportunity to utilize an open source data analysis tool, R, for data manipulation, analysis, and visualization. Finally, in this course we will discuss diverse issues around data including technologies, behaviors, organizations, policies, and society. (Same as LIS 661.)

ICT 662 DATA ANALYSIS AND VISUALIZATION. (3)

This course examines three major categories of topics in relation to data analysis and visualization. First, this course will cover the basic ways that data can be obtained from various sources, such as raw text files, web APIs, and data repositories. It will also cover the techniques of data cleaning and how to organize data for analysis. Second, the course will cover the essential techniques for analyzing quantitative data. It will teach prediction and clustering methods that are useful to solve various real data analysis tasks. In addition, students will learn major theories and recent methods in text analysis. Third, this course teaches how to create visualizations that effectively communicate the meanings behind data and information. The course will cover key practical skills in information visualization, such as plotting, mapping, and network visualization. This course will not be mathematically intensive. Instead, the course will use existing computational tools and programming libraries to solve various problems. You will use the R language and environment intensively for data analysis and visualization. (Same as LIS 662.)

ICT 690 SPECIAL TOPICS IN LIBRARY AND INFORMATION SCIENCE. (3)

Intensive study of one aspect of library and information science under the leadership of an authority in the area. (Same as LIS 690.)

ICT 695 INDEPENDENT STUDY IN INFORMATION COMMUNICATION TECHNOLOGY. (3)

Opportunities for directed study in subjects or problems of interest to a student. Observation and research required, and a written report describing the work accomplished. Prereq: Consent of instructor and approval of proposal.