Brothers, Sheila C

This is a recommendation that the University Senate approve, for submission to the Board of Trustees, the establishment of a new graduate program: MS in Information Communication Technology, in the School of Library & Information Science within the College of Communication & Information.

Dr Andrew Hippisley
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http://linguistics.as.uky.edu/user/751

NEW MASTERS DEGREE PROGRAM FORM
(Attach completed "Application to Classify Proposed Program"[1])

GENERAL INFORMATION

College:	College of Communication and Information	Department:	School of Library and Information Science

Major Name:	Information Communication Technology	Degree Title:	MS

Formal Option(s):	Health Technology and Analytics Policy and Regulation	Specialty Fields w/in Formal Option:	

Date of Contact with Associate Provost for Academic Administration[1]: 7/30/2012

Bulletin (yr & pgs):		CIP Code[1]:		Today's Date:	9/17/2012

Accrediting Agency (if applicable):

Requested Effective Date: ☒ Semester following approval. OR ☐ Specific Date[2]:

Dept. Contact Person:	Will Buntin	Phone:	7-3317	Email:	will.buntin@uky.edu

CHANGE(S) IN PROGRAM REQUIREMENTS

1.	Number of transfer credits allowed	9
	(Maximum is Graduate School limit of 9 hours or 25% of course work)	
2.	Residence requirement (if applicable)	
3.	Language(s) and/or skill(s) required	
4.	Termination criteria	Student must maintain a 3.0 GPA; if a student earns a third grade of C or lower, student may be dismissed from program
5.	Plan A Degree Plan requirements[3] (thesis)	
6.	Plan B Degree Plan requirements[3] (non-thesis)	This is a Plan B degree; exit requirement will be a portfolio
7.	Distribution of course levels required	
	(At least one-half must be at 600+ level & two-thirds must be in organized courses.)	
8.	Required courses (if applicable)	ICT 600, ICT 602, ICT 668, CJT 726 ICT 596 (repeated for total of 6 hours)
9.	Required distribution of courses within program (if applicable)	Students are expected to complete twelve hours of required course work (600, 602, 668 and CJT 726) within the first 18 hours of their program of study with the exception of ICT 596 Practicum (to be taken after completion of 18 hours). The core courses (except for 596) are basic courses that will introduce fundamental content, themes, and issues. Elective courses will build on these foundational concepts and incorporate increasing

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[1] Prior to filling out this form, you MUST contact the Associate Provost for Academic Administration (APAA). If you do not know the CIP code, the APAA can provide you with that during the contact.

[2] Programs are typically made effective for the semester following approval. No changes will be made effective until all approvals are received.

[3] If there is only one plan for the degree, plans involving a thesis (or the equivalent in studio work, etc.) should be discussed under Plan A and those not involving a thesis should be discussed under Plan B.

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		levels of complexity in the master's curriculum. Electives will also allow students to specialize their studies based on their areas of interest (and in consultation with program faculty). The intent of ICT 596 Practicum is to allow students to apply concepts from the classroom in real world environment and gain practical experience.
10.	Final examination requirements	The ICT master's degree program requires successful completion of 36 hours (18 hours of electives along with required courses described) and a program portfolio. With the faculty adviser's prior approval, as many as 6 elective hours may be taken in a cognate area of study. Candidates for the master's must produce a satisfactory program portfolio which is used to evaluate the candidate's ability to discuss significant aspects of Information Communication Technology in an integrated and coherent manner. A student who has an I grade or who is on academic probation is not permitted to submit a portfolio. A final evaluation is required of all master's students at the University of Kentucky. Ultimately, it is the student's responsibility to see that all School and Graduate School requirements are met prior to submitting a program portfolio. The program portfolio provides the student with the opportunity for self-reflection, formative self-evaluation, and synthesis of desired learning outcomes. Students have the opportunity through the portfolio to holistically examine their program of study and highlight their accomplishments in the studies, reflect on their learning in the context of core competencies, and reflect on how their work in the program has prepared them for their career goals. The portfolio consists of a professional resume or vita, personal statement on overall program experience, summary list of course artifacts or other materials selected for inclusion in the portfolio, actual artifacts selected for inclusion, and a learning outcomes essay. Program portfolios are assessed on a pass/fail basis using an evaluation rubric. Final grades of pass/fail will be submitted to the Graduate School by the Exam Committee.

11.	Explain whether the proposed new program (as described in numbers 1 through 10) involve courses offered by another department/program. Routing Signature Log must include approval by faculty of additional department(s).
	Programs in the College of Education, College of Public Health, College of Health Sciences and other departments within the College of Communication and Information have all agreed to offer some of their courses as electives.

12.	What is the rationale for the proposed new program?
	Information Communication Technology (ICT) programs strive to educate students to assume leadership roles where the application of information technology is concerned with the ultimate goal of connecting people, organizations, and communities to enhance their ability to succeed. The broad cluster of occupations within the ICT arena includes, but is not limited to: computer analysts, computer support specialists, technical writers, media and communications, and instructional coordinators. ICT is a growing field with growth exceeding projected growth in several categories (see full proposal). Currently, there is not a UK program focused on the practical application of technology. This proposal serves to address this. Note that this degree is NOT equivalent to a degree in computer science and does not qualify students for positions which specifically require a degree in computer science. This graduate program will allow students to focus on advanced areas of study related to ICT. The

curriculum introduces increasing levels of complexity that reflect the realities of various practice settings. Students who successfully complete this graduate program will be qualified to assume leadership positions in ICT that require an advanced degree beyond the undergraduate level.

NEW MASTERS DEGREE PROGRAM FORM

Signature Routing Log

General Information:

Program Name: Master's in Information Communication Technology

Proposal Contact Person Name: Dr. Jeffrey Huber   Phone: 7-2334   Email: jeffrey.huber@uky.edu

INSTRUCTIONS:
Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Library Science Faculty	8/24/2012	Dr. Jeff Huber / 7-2334 / jeffrey.huber@uky.edu	
College of Communication and Information	9/24/2012	Dean O'Hair / 218-0290 / ohair@uky.edu	
College of Education	8/14/2012	Dean O'Hair / 7-2813 / mjohair@uky.edu	
College of Public Health	8/14/2012	Dean Wyatt / 8-2247 / swwyat2@uky.edu	
College of Health Sciences	8/14/2012	Dean Stewart / 323-1100 / sharon.stewart@uky.edu	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision[4]
Undergraduate Council			
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

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[4] Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.
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PROPOSAL FORM

General Information

1. **Degree Level and Designation: _Master of Science_____**
    (Ex. Master of Arts, PhD, Bachelor of Science, etc.)

2. **Title of Proposed Major: _Information Communication Technology_____**
    (Ex. Linguistic Theory, International Finance, Rhetoric and Writing, etc.)

3. **CIP Code: _____**

4. **College and Educational Unit Proposing This Program: _College of Communication / School of Library and Information Science**

5. **Effective Date:** ☐**X** **Sem following approval   OR   ☐Other __ _____**

6. **Anticipated Date for Granting First Degree: __Fall 2017 (estimate)_____**

Contact Information

7. **Who is submitting this proposal and overseeing its completion?**

    Name: __Dr. Jeffrey Huber_____ Title: _Director_____

    Email: _jeffrey.huber@uky.edu_____ Phone: _859-257-2334_____

8. **Who will be the Program Director for this Degree?**

Name: __Jeffrey Huber_____ Title: __Director_____

Email: _jeffrey.huber@uky.edu_____ Phone: __859-257-2334_____

MISSION

9. **Provide a brief description of the program**: (130 word limit)
    The Information Communication Technology (ICT) master's program will provide further education for graduate students seeking leadership roles where the application of information technology is concerned with the ultimate goal of connecting people, organizations, and communities to enhance their ability to succeed. The graduate program will build on and extend the skills and content covered in the undergraduate program.

10. **List the Objectives of the Proposed Program:** Note: this is not the place to list student learning outcomes. The question refers to the program itself. Program objectives should deal with the specific institutional and societal needs that this program will address. (200 word limit)
    This graduate program will allow students to focus on advanced areas of study related to ICT. The curriculum introduces increasing levels of complexity that reflect the realities of various practice settings. Students who successfully complete this graduate program will be qualified to assume leadership positions in ICT that require an advanced degree beyond the undergraduate level. Information Communication Technology (ICT) programs strive to educate students to assume leadership roles where the application of information technology is concerned with the ultimate goal of connecting people, organizations, and communities to enhance their ability to succeed. The broad cluster of occupations that fall within the ICT arena includes, but is not limited to computer analysts, computer support specialists, technical writers, media and communications, and instructional coordinators. ICT is a growing field with actual growth exceeding projected growth in several categories (see full proposal). Currently, there is not a UK program focused on the practical application of technology. This proposal serves to address this. Note that this degree is NOT equivalent to a degree in computer science and does not prepare a student for a job in software development or programming. The objectives of the proposed program include educating and preparing students for a successful career in the ICT field in a global economy ever more dependent upon technology. This will be accomplished by exposing students to theoretical underpinnings of ICT as well as practical applications of technology.

11. **Does this program allow for academic options**? __Yes_ (NOTE: be aware of the new CPE naming conventions) If yes, list below:

    > Undergraduate options = Tracks
    > Master's options = Concentrations
    > Doctoral options = Specializations

a. Name: Health Track
    Description: Concentration in Health ICT (20 word limit)

b. Name: Technology and Analytics Track

Description: Concentration in Technology and Analytics (20 word limit)

c. Name: Policy and Regulation Track
    Description: Concentration in Policy and Regulation (20 word limit)

(include more options as needed)

QUALITY

12. **Describe how the proposed curriculum will achieve the <u>program objectives</u>. (100 word limit)**
    Broadly stated, students will learn how to use technology to enhance communication and the use of information in organizations. Using an interdisciplinary curriculum, students will gain an understanding of the application of ICT in a variety of settings. Students at the graduate level will have the option to focus their studies in three areas – *health, technology and analytics* or *policy and regulation*.

13. **What are the intended <u>student learning outcomes</u> of the proposed program? (100 word limit)**
- Explain the historical context for studying ICT, contrast it with other computing-related academic disciplines, and understand the impact of information technology on individuals, organizations, and society.
- Identify the role of information systems in solving specific problems within the student's emphasis area with a focus on software applications and the tasks and techniques for developing computer-based information systems.
- Apply the central concepts of management and organizational theory as they apply to organizational settings and the technology marketplace.
- Identify and assess information technology infrastructures and systems that support corporate and organizational goals.
- Evaluate how people process and use information in the context of information systems with emphasis on ways to manage the technology associated with information systems.
- Assess relevant aspects of government policy governing information and communication technologies in the United States with a focus on standards of moral and ethical conduct associated with management of information systems, as well as issues and challenges faced in developing and implementing policies within organizations and companies.
- Apply concepts and characteristics of standard database structure.
- Identify the foundational concepts of information retrieval, analyze the performance of retrieval systems, and will be able to apply these concepts in practice.
- Evaluate an organization's information technology system, including hardware, computer networks, software, data, processes and people.
- Generate new knowledge by applying audience analytics to a data set.

14. **Is there a specific accrediting agency related to this program? If so, identify and indicate if you plan to seek accreditation:** No. Master's level programs in this area are not accredited.

15. **How will the program support or be supported by other programs within the institution? (50 word limit)** (Ex. shared faculty, shared courses, collaborative research, etc.) This program will share courses across the College of Communication and Information and the colleges of Education, Public Health and Health Sciences.

16. **Will this program replace or enhance any existing program(s) or options within an existing program? If so, please specify.** No

17. **Give an estimated faculty/student ratio in the major: _.095_____**

18. **Highlight any distinctive qualities of this proposed program. (150 word limit)**
- Are any of your faculty nationally or internationally recognized for expertise in this field?
- Does this program build on the expertise of an existing <u>locally</u>, nationally or internationally recognized program at your institution?
- Do you have any specialized research facilities or equipment that are uniquely suited to this program?
  This program will be the only one of its kind in the state. It will build on existing strengths within the School of Library and Information Science and the College of Communication and Information. This program will be interdisciplinary, including courses from the colleges of Education, Public Health and Health Sciences. Whereas existing programs in the state focus on the development of IT resources, the proposed ICT program will focus on the application of IT within a variety of settings reflective of today's global workplace. The Dean's Office has set aside funds to refurbish space for an ICT lab to support the program. Refer to page 44 for list of existing CCI faculty members qualified to teach ICT courses.

19. **Clearly state the admission, retention, and completion standards designed to encourage high quality.**
   Students will be able to apply directly to the graduate program, or, for UK undergraduates, enter through the University Scholars 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 140 or higher, quantitative: new exam 140 or higher OR old exam 450 or higher, and analytical writing 4.0 or higher. Applicants for whom English is not the native language must achieve a TOEFL score of 550 (paper-based test) 213 (computer-based

test) or 79 (internet-based test. Students will be required to complete Microsoft Certification exams, but not as an entrance requirement.

Undergraduate students enrolled at the University of Kentucky will have the option of beginning the master's program in Information Communication Technology through the established University Scholars Program and will follow standard Graduate School admission policies for that category. Applicants to this program will be expected to meet all admission criteria as set forth by the University of Kentucky Graduate School (for more detail, please refer to Admission Categories (http://www.research.uky.edu/gs/ProspectiveStudents/admission_categories.html) and the University Scholars Program Application (http://www.research.uky.edu/gs/Forms/UnivScholarsPgmApp.pdf) Note that GRE scores are not required by the Graduate School for USP students. The program will follow Graduate School requirements for all USP students.

20. **Clearly state the degree completion requirements for the program, other than completion of coursework.** (Ex. projects, presentations, internships, capstone projects, etc.) Students will be required to complete an internship and practicum during the program. All students will be required to complete a program portfolio as well.

21. **Provide the following information for the program and for each option** (some categories may not apply to all programs):
    a. Total number of hours required for degree: _____ (If this number exceeds 120, please explain)   36
    b. Number of hours in degree program core: 18
    c. Number of hours in concentration:
    d. Number of hours in guided electives: 12
    e. Number of hours in free electives: 6
    f. Total number of hours required by level:

   100 ___   200 ___300 ___ 400 ___ 500 _0-15___ 600 _21-36___ 700 ____ 800 ____   900 ____

22. **Will this be a 100% distance-learning program?**
No

23. **Does a significant portion of this program use distance-learning technologies? If so, please describe.** No.

24. **Will there be any collaboration with other institutions required or utilized in this program?** No

DEMAND, NEED, and RATIONALE FOR PROGRAM

25. **Show evidence to support the need and demand for this proposed program.** (Ex. student demand, career opportunities, recent trends in the discipline, etc.) The U.S. Department of Labor (USDL) projected growth rates for employment in the ICT sector trends favorably for the ten-year forecast period. Employment projections in most job categories reflect double-digit percentage increases over that term. Employment availability in two categories (Information Security Analysts, Web Developers, and Computer Network Architects (107%); Media and Communication Workers, All Other (148%)) already exceeds the projected numbers for 2020.

26. **Are you aware of any similar programs already being offered in Kentucky?** There are very few similar programs in the state. Other Kentucky based programs are highly computer science focused. Our proposed program will emphasize the practical application of technology, in a variety of settings, to connect people, organizations, and communities to enhance their ability to succeed

27. **Identify the applicant pool, primary feeders, and how potential students will be recruited**. It is believed that this program will recruit new graduate students who may not have previously considered the University of Kentucky. Additionally, it will attract students from the ICT undergraduate major now at the University of Kentucky. Prospective students will be recruited through traditional means – web site, UK student recruitment events, direct mail. In addition, the department may explore the possibility of online advertising as well.

REVIEW AND ASSESSMENT

28. How will the _Student Learning Outcomes_ for the program be assessed? Artifacts from the program portfolio will be assessed in comparison to student learning outcomes.

29. What are the plans to evaluate students' post-graduate success? The program faculty will administer surveys to graduates to assess student success (employment or further graduate study). Employers will also be surveyed to determine how well the program prepares students for employment.

30. What are the plans for evaluating achievement of the Program Objectives, consistent with the institutional mission?
    Faculty will survey ICT program alumni to determine how well the ICT curriculum prepared them to either work or continue their education in a technology driven global economy. Faculty will also survey employers to determine how employers view the effectiveness of the ICT curriculum in preparing graduates to enter the workforce. The survey results will then be used for iterative refinement of ICT curriculum.

_____

NOTE: In addition to these questions, please complete the indicated portions of the appropriate form posted at the [Senate web site](#) :

NEW <u>UNDERGRADUATE </u>PROGRAM FORM – Please include Questions 2-13, and 15.

NEW <u>MASTERS</u> DEGREE PROGRAM FORM – Please include Questions 1-11.

NEW <u>DOCTORAL </u>DEGREE PROGRAM FORM – Please include Questions 1-12.

NEW <u>GRADUATE AND PROFESSIONAL CERTIFICATE</u> FORM: Questions 1-11 of the New Master's Degree Program Proposal form.

MASTER'S PROGRAM PROPOSAL

INFORMATION COMMUNICATION TECHNOLOGY (ICT)

Summary of Recent Changes:

The following changes have been made to this proposal in line with recommendations from the Senate Council

- Require a leadership class (CJT 726 Communication Leadership Studies)
- Indicate that an ICT leadership course is forthcoming (see Suggested Curriculum Maps)
- Include in narrative any pre-requisite courses for electives outside the ICT program (see Suggested Curriculum Maps)
- Corrected typographical errors

The following changes have been made to this proposal in line with recommendations from the Senate Academic Program Committee

- Distinguish the master from the bachelor degree
- Address how the program will handle admitting students who do not have an undergraduate degree in Information Communication Technology into the master's program

Both of these issues are addressed in this document. This text is also included below for easy reference.

Distinguishing the MS from the BS

Although in the undergraduate program students may choose one of two tracks, the BS degree is geared toward offering students a broad educational experience in information communication technology. In contrast, students in the master's program will begin to focus on a certain area or aspect of information communication technology. Students admitted to the master's program may concentrate their studies into three tracks: health, technology and information management or policy and regulation. Or, students may choose to create a program of ICT that best suits their educational and professional goals.

While the undergraduate curriculum is designed to prepare students to assume positions that require basic knowledge and skills commensurate with bachelor's level preparation, the master's curriculum is designed to prepare students to assume positions that require more in-depth knowledge of the field. The curricula reflect the knowledge and skill sets necessary to compete in the ICT job market. Concentration areas in the graduate curriculum reflect available positions that require a master's degree. The ICT curriculum includes courses from other Colleges to support these areas of specialization as well as those courses offered within the College of Communication and Information.

It is perhaps worth noting that while there are similarities of the content covered in both the undergraduate and graduate program, this is not at all unusual in other disciplines offering both a bachelors and masters. For example, many English programs will have undergraduate courses discussing Shakespeare and include similar type courses in their master's program. As is expected in an advanced degree, while there are similarities of content, the focus in a graduate level course will be at a higher level, progress in topic complexity, involve more theory and be at a higher level of detail.

Admitting Students: Without ICT BS

The decision to not require a degree in technology for entrance into the program was purposeful. To allow for the broadest range of possible students and to further the interdisciplinary goals of the program, we thought it best to allow for a diverse range of students. We do expect students without an actual degree in ICT or related fields may well have life and work experience sufficient enough to begin the program upon admission. And while we believe most students who would be attracted to this program will have appropriate skills, it is possible we may have students who enter the program without a degree or sufficient background/experience with technology. These students will be prescribed up to one remedial semester after consultation with her/his adviser. After completing the first round of prescribed remedial courses, students will once again meet with their adviser to discuss next steps – taking additional courses outside the ICT master's program or, if ready, beginning the ICT master's core curriculum.

Example: James is accepted to the graduate program in ICT. He has excellent GRE scores and a good undergraduate GPA of 3.4. Though he graduated with a degree in Marketing, he has worked the last 10 years managing the web site where he works. He is very interested in technology and how it impacts communication. He is very comfortable with HTML, CSS, Web2.0, Internet techologies, etc. However, he has had little to no experience with databases and does not understand what a relational database is. After meeting with his adviser, the decision is made for James to take ICT 301 Introduction to Databases. He is also a little nervous about coming back to school after being out for 10 years and is concerned about his writing skills. It is also suggested he take ICT 300 Infomration and Commnication Technology in Society which has a strong written compenent. At the end of that semester, James meets with his adviser again. He did very well in both courses and feels much more confident in the areas where he was weak. After talking with his adviser, they both decide James is ready to begin the graduate program. The suggestion is made for James to start with no more than 6 hours so he can continue to adjust to being back in school and in a master's level program.

Program Overview

Introduction

Information Communication Technology (ICT) programs strive 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.

Our School has proposed two ICT programs – an undergraduate degree (which received final UK BOT approval 12/17/12 and CPE approval 02/14/14) and a master's degree. The undergraduate degree is well suited to prepare students for entry level positions. The master's program is focused on advanced study of similar concepts to give graduates the skills needed to assume leadership positions. Students in the master's program will also have the option to focus their studies in any of three major focus areas: policy and regulation, technology and analytics and health.

This proposed 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, as opposed to teaching students how to program in C++. While other Kentucky-based programs exist, they are either based largely on computer science or are discipline specific, rather than focusing on the application of information technology across disciplines. In general, the proposed 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.

The proposed ICT program enhances the University's existing initiatives related to Science, Technology, Engineering, and Mathematics (STEM) by providing the opportunity for students to pursue academic degrees focused on the application of information technology. It reflects sentiments expressed by the National Conference of State Legislatures suggesting that education systems consider strategies that prepare students for jobs in a 21st Century workforce. In a knowledge-driven global economy, the ability to apply, use, and manage technology is key to the success of the 21st Century workforce. The broad cluster of occupations that fall within the ICT arena include software and applications specialists, computer network professionals, database and systems administrators, IT security officers, ICT business and systems analysts, telecommunications professionals, multimedia specialists, Web developers, technical support, and quality assurance and testing professionals.

The ICT program proposal was developed in consultation with the other units in the College, including the School of Journalism and Telecommunication (JAT), the Department of Communication (COM) and the Division of Instructional Communication (CIS). The proposed ICT program has met with a great deal of interest on campus with multiple units agreeing to include their courses in the ICT curriculum (College of Education, College of Public Health, College of Health

Sciences). Additionally, other units contacted have expressed no objection to this program (including Business and Economics and Computer Science). Furthermore, College support is extremely strong with funding already set aside for two new faculty lines (one at the Associate level in the Regular Title series, one at the Assistant level in the Regular Title series) beginning Fall 2013. In addition, Dean O'Hair has dedicated funding to build new faculty offices. For more details, see the "Resources and Staffing" section below.

Dean O'Hair was part of the UK delegation to China early 2013. While there, he spoke with representatives from two colleges who were primarily interested in the proposed ICT program. Similarly, in a recent conversation, the CEO of the National Association of State Chief Information Officers expressed his interest to Dean O'Hair in the proposed ICT program due to the large (and growing) number of jobs in state governments requiring applied IT skills. The 2012 State CIO Survey "Advancing the C4 Agenda: Balancing Legacy and Innovation" considers such issues as IT mobility, transparency and accountability, IT consolidation, health information exchange, big data, cloud computing, IT personnel, IT procurement, public safety broadband, and the use of social media.

ICT Master's Program

The ICT curriculum is delivered primarily face-to-face. This program is a 36 credit hour ICT master's degree.

Distinguishing the MS from the BS

Although in the undergraduate program students may choose one of two tracks, the BS degree is geared toward offering students a broad educational experience in information communication technology. In contrast, students in the master's program will begin to focus on a certain area or aspect of ICT. Students admitted to the master's program may concentrate their studies into one of three tracks: health, technology and information management, or policy and regulation. Or, students may choose to create a program of ICT that best suits their educational and professional goals.

While the undergraduate curriculum is designed to prepare students to assume positions that require basic knowledge and skills commensurate with bachelor's level preparation, the master's curriculum is designed to prepare students to assume positions that require more in-depth knowledge of the field. The curriculum reflects the knowledge and skill sets necessary to compete in the ICT job market. Concentration areas in the graduate curriculum reflect available positions that require a master's degree. The ICT curriculum includes courses from other colleges to support these areas of specialization as well as those courses offered within the College of Communication and Information.

It is perhaps worth noting that while there are similarities of content covered in both the undergraduate and graduate program, this is not at all unusual in other disciplines offering both a bachelors and masters. For example, many English programs will have undergraduate courses discussing Shakespeare and include similar type courses in their master's program. As is expected in an advanced degree, while there are similarities of content, the focus in a graduate level course will progress in topic complexity, involve more theory and be at a higher level of detail.

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The decision to not require a degree in technology for entrance into the program was purposeful. To allow for the broadest range of possible students and to further the interdisciplinary goals of the program, we thought it best to allow for a diverse range of students. We do expect students without a degree in ICT or a related field may well have life and work experience sufficient enough to begin the program upon admission. And while we believe most students who would be attracted to this program will have appropriate skills, it is possible we may have students who enter the program without a degree or sufficient background/experience with technology. These students will be prescribed up to one remedial semester after consultation with her/his adviser. After completing the first round of prescribed remedial courses, students will once again meet with their adviser to discuss next steps – taking additional courses outside the ICT master's program or, if ready, beginning the ICT master's core curriculum.

Example: James is accepted to the graduate program in ICT. He has excellent GRE scores and a good undergraduate GPA of 3.4. Though he graduated with a degree in Marketing, he has worked the last 10 years managing the web site for his workplace. He is very interested in technology and how it impacts communication. He is very comfortable with HTML, CSS, Web2.0, Internet technologies, etc. However, he has had little to no experience with databases and does not understand what a relational database is. After meeting with his adviser, the decision is made for James to take ICT 301 Introduction to Databases. He is also a little nervous about coming back to school after being out for 10 years and is concerned about his writing skills. It is also suggested he take ICT 300 Information and Communication Technology in Society which has a strong written

component. At the end of that semester, James meets with his adviser again. He did very well in both courses and feels much more confident in the areas where he was weak. After talking with his adviser, they both decide James is ready to begin the graduate program. The suggestion is made for James to start with no more than 6 hours so he can continue to adjust to being back in school and in a master's level program.

ICT Curriculum
Students are expected to complete twelve hours of required course work (600, 602, 668 & CJT 726) within the first 18 hours of their program of study with the exception of ICT 596 Practicum (to be taken after completion of 18 hours). The core courses (except for 596) are basic courses that introduce fundamental content, themes and issues. Elective courses build on these foundational concepts and incorporate increasing levels of complexity in the master's curriculum. Electives also allow students to specialize their studies based on their areas of interest (and in consultation with program faculty). The intent of ICT 596 Practicum is to allow students to apply concepts from the classroom in real world environments and gain practical experience.

Each student will develop an individualized learning plan in conjunction with her/his adviser based on the student's background and career aims. While there will be proposed concentration areas, students will be able to customize electives more broadly as best suits their goals. However, these decisions will be made in conjunction with their academic adviser. Students will take all required courses (except ICT 596 Practicum) within the first eighteen hours of the program. The remaining hours will be comprised of electives based on the student's interests and six hours of ICT 596 Practicum.

Once the student has entered the final semester of course work, she/he will begin work on the program portfolio (program exit requirement). The program portfolio provides the student with the opportunity for self-reflection, formative self-evaluation, and synthesis of desired learning outcomes. Students have the opportunity through the portfolio to holistically examine their program of study and highlight their accomplishments, reflect on their learning in the context of core competencies, and reflect on how their work in the program has prepared them for their career goals. The portfolio consists of a professional resume or vita, personal statement on overall program experience, summary list of course artifacts or other materials selected for inclusion in the portfolio, actual artifacts selected for inclusion, and a learning outcomes essay.

Graduate School Admission and Student Status for MS Degree Program
Students pursuing the ICT MS degree will apply to the Graduate School for admission to the ICT MS degree program. As with many academic programs related to information science, there is no preferred undergraduate degree program. While completing the ICT undergraduate degree program would be helpful, it is not required. 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 140 or higher, quantitative: new exam 140 or higher OR old exam 450 or higher, and analytical writing 4.0 or higher. Applicants for whom English is not the native language must achieve a TOEFL score of 550 (paper-based test) 213 (computer-based test) or 79 (internet-based test). Students that find themselves hampered by a lack of technical ability may take 500-level undergraduate courses, with the advice of faculty or staff, to remedy any deficiencies.

Students entering the ICT graduate program must complete online Microsoft Office trainings, available through the University at no charge, for Word, Access, Excel, and PowerPoint by the end of their second semester. These trainings serve a leveling function and help to ensure that students entering the graduate program directly possess sufficient skills with Microsoft products. In addition, basic concepts included in required courses in the undergraduate curriculum are re-

introduced in required courses at the graduate level with more in-depth coverage, placing them in philosophical and theoretical contexts.

Conditional Admission to the ICT Graduate Program

For applicants to the ICT graduate program who do not meet the admissions requirements, conditional admission may be recommended by the Director of Graduate Studies. For example, conditional admission might be recommended in cases where an applicant has a marginal undergraduate grade point average, but excellent GRE scores, strong recommendations, and especially relevant experience.

ICT Graduate Program Required Grade Point Average and C Grades

A grade point average of 3.0 (B) must be maintained for continued enrollment in the ICT graduate program. Failure to do so results in academic probation, and will result in dismissal, if, in the prescribed time, the grade point average is not raised to a 3.0 or higher. A student who earns a third C (or lower) is dismissed from the program.

I (Incomplete) Grades

For graduate students, any I (incomplete) grade must be replaced by a regular final letter grade within 12 months of the end of the semester or term in which the I grade was assigned, or prior to the student's graduation, whichever occurs first. If at that time the I grade has not been changed to some other regular final letter grade, it will be changed to a grade of E.

ICT Graduate Program Final Exam and Exit Requirements

The ICT master's degree program requires successful completion of 36 hours (18 hours of electives along with required courses described below) and a program portfolio. With the faculty adviser's prior approval, as many as 6 elective hours may be taken in a cognate area of study.

Candidates for the master's must produce a satisfactory program portfolio which is used to evaluate the candidate's ability to discuss significant aspects of Information Communication Technology in an integrated and coherent manner. A student who has an I grade or who is on academic probation is not permitted to submit a portfolio. Ultimately, it is the student's responsibility to see that all School and Graduate School requirements are met prior to submitting a program portfolio.

The program portfolio provides the student with the opportunity for self-reflection, formative self-evaluation, and synthesis of desired learning outcomes. Students have the opportunity through the portfolio to holistically examine their program of study and highlight their accomplishments, reflect on their learning in the context of core competencies, and reflect on how their work in the program has prepared them for their career goals. The portfolio consists of a professional resume or vita, personal statement on overall program experience, summary list of course artifacts or other materials selected for inclusion in the portfolio, actual artifacts selected for inclusion, and a learning outcomes essay. Program portfolios are assessed on a pass/fail basis using an evaluation rubric. Final grades of pass/fail will be submitted to the Graduate School by the Exam Committee.

ICT Graduate Learning Outcomes

1. Explain the historical context for studying ICT, contrast it with other computing-related academic disciplines, and understand the impact of information technology on individuals, organizations, and society.

2. Identify the role of information systems in solving specific problems within the student's emphasis area with a focus on software applications and the tasks and techniques for developing computer-based information systems.

3. Apply the central concepts of management and organizational theory as they apply to organizational settings and the technology marketplace.

4. Identify and assess information technology infrastructures and systems that support corporate and organizational goals.

5. Evaluate how people process and use information in the context of information systems with emphasis on ways to manage the technology associated with information systems.

6. Assess relevant aspects of government policy governing information and communication technologies in the United States with a focus on standards of moral and ethical conduct associated with management of information systems, as well as issues and challenges faced in developing and implementing policies within organizations and companies.

7. Apply concepts and characteristics of standard database structure.

8. Identify the foundational concepts of information retrieval, analyze the performance of retrieval systems, and will be able to apply these concepts in practice.

9. Evaluate an organization's information technology system, including hardware, computer networks, software, data, processes and people.

10. Generate new knowledge by applying audience analytics to a data set.

ICT Graduate Level Learning Outcomes

1. Explain the historical context for studying ICT, contrast it with other computing-related academic disciplines, and understand the impact of information technology on individuals, organizations, and society.
2. Identify the role of information systems in solving specific problems within the student's emphasis area with a focus on software applications and the tasks and techniques for developing computer-based information systems.
3. Apply the central concepts of management and organizational theory as they apply to organizational settings and the technology marketplace.
4. Identify and assess information technology infrastructures and systems that support corporate and organizational goals.
5. Evaluate how people process and use information in the context of information systems with emphasis on ways to manage the technology associated with information systems.
6. Assess relevant aspects of government policy governing information and communication technologies in the United States with a focus on standards of moral and ethical conduct associated with management of information systems, as well as issues and challenges faced in developing and implementing policies within organizations and companies.
7. Apply concepts and characteristics of standard database structure.
8. Identify the foundational concepts of information retrieval, analyze the performance of retrieval systems, and will be able to apply these concepts in practice.
9. Evaluate an organization's information technology system, including hardware, computer networks, software, data, processes and people.
10. Generate new knowledge by applying audience analytics to a data set.

ICT Graduate Learning Outcomes Mapping

	Learning Outcomes									
Core course	1	2	3	4	5	6	7	8	9	10
ICT 600	✓		✓			✓			✓	✓
ICT 602					✓		✓	✓	✓	
ICT 668	✓	✓		✓			✓		✓	✓
CJT 726			✓	✓						
ICT 596		✓	✓			✓		✓		✓

Suggested Curriculum Maps

Course	Req/Elective	Notes	Concentration
ICT 600	Required	ICT in Society	
ICT 602	Required	Information Representation and Access	
ICT 596	Required	Practicum, 3 credit hours repeated (6 total)	
CJT 726	Required	Communication Leadership Studies *Note that this course will be taken as a cognate course until such time as ICT 607 Introduction to Leadership in Information Professions has been approved. At that time, ICT 607 will replace CJT 726.*	
ICT 668	Required	Information Systems Design, CL with LIS 668	
ICT 552	Elective	Cybercrime and Digital Law Enforcement	Policy & Regulation
LIS 605	Elective	Information Policy & Regulation	Policy & Regulation
ICT 630	Elective	Proseminar in Mass Media Law and Public Policy, CL with CJT 630	Policy & Regulation
CJT 730	Elective	Seminar in Mass Media and Public Policy	Policy & Regulation
ICT 651	Elective	Technology Security	Technology & Analytics
ICT 630	Elective	Information Retrieval, CL with LIS 630	Technology & Analytics
ICT 550	Elective	Security Informatics	Technology & Analytics
ICT 638	Elective	Advanced Web Design	Technology & Analytics
ICT 658	Elective	Knowledge Management, CL with LIS 658	Technology & Analytics
LIS 634	Elective	Information Architecture	Technology & Analytics

ICT 610	Elective	Participatory Communication, CL with CJT 610	Health
LIS 539	Elective	Introduction to Medical Informatics	Health
ICT 640	Elective	Health Information Resource Services, CL with LIS 640	Health
ICT 626	Elective	Electronic Information Resources in the Health Sciences CL with LIS 626	Health
ICT 627	Elective	Consumer Health Information Resources CL with LIS 627	Health
CJT 771	Elective	Seminar in Health Communication	Health
CJT 775	Elective	Seminar in Health Communication Campaigns	Health
CPH 752	Elective	Leadership in Public Health (3 hrs)	
ELS 602	Elective	Leadership in Professional Learning Communities (3 hrs)	
EDL 665	Elective	School Technology Leadership for Digital Citizenship	
ICT 607	Elective	Introduction to Leadership in Information Professions (3 hrs, in progress)	

The following courses have been approved by the home unit for inclusion in the ICT curriculum.
Unless otherwise noted, these courses do not have pre requisites.
HSM 601 Overview of US Healthcare
HSM 602 Organizational Change and Strategic Planning (pre req HSM 601)
HSM 624 Information Systems in Health Care (pre req HSM 602)
EDC 547 Technology in Instructional Practice
EDC 548 Instructional Technology Leadership

The following courses are being offered by our College in support of the ICT curriculum:
CJT 671 Proseminar in Health Communication
CJT 726 Communication Leadership Studies
JOU 531 Media Law and Ethics
JOU 541 The First Amendment, Internet and Society
MAS 535 Telecommunications and Network Management

The following courses are other suggested University courses:
CPH 752 Leadership in Public Health
ELS 602 Leadership in Professional Learning Communities
EDL 665 School Technology Leadership for Digital Citizenship
STA 580 Biostatistics I (pre req MA 109 College Algebra or equivalent)

PA 621 Quantitative Methods of Research
PA 623 Decision Analysis and Decision Support Systems (pre req PA 621)
PA 624 Government Information Systems

Students are expected to complete twelve hours of required course work (600, 602, 668 & CJT 726) within the first 18 hours of their program of study with the exception of ICT 596 Practicum (to be taken after completion of 18 hours). The core courses (except for 596) are basic courses that will introduce fundamental content, themes and issues. Elective courses will build on these foundational concepts and incorporate increasing levels of complexity in the master's curriculum. Electives will also allow students to specialize their studies based on their areas of interest (and in consultation with program faculty). The intent of ICT 596 Practicum is to allow students to apply concepts from the classroom in real world environments and gain practical experience. Concentration areas at the graduate level are based on available ICT jobs that require a master's degree. Concentration areas at the graduate level provide knowledge and skills beyond that provided at the undergraduate level.

Course Descriptions

Advanced Undergraduate/Graduate

JOU 531, Media Law and Ethics

A study of the legal and ethical issues facing the mass media. The course will focus on the rights, constraints and responsibilities under the U.S. Constitution, federal and state statutes, administrative law, common law and voluntary codes of ethics. Specific topics include libel, privacy, contempt, copyright, broadcast regulation, the court systems, commercial speech, prior restraint, access, the civil and criminal judicial processes and obscenity.

MAS 535, Telecommunications Network Management

The primary focus of this course is the design and management of telecommunications networks and resources. In a framework that includes both the technical and business aspects of telecommunications, the course examines the capabilities and limitations of a wide range of data network technologies in the context of needs assessments, design, implementation, and evaluation; the relative advantages and disadvantages of various technological configurations for specific business purposes; and the impact of human and organizational factors in network design.

Prereq: MAS major or minor status, or consent of the instructor.

LIS 539, Intro to Medical Informatics

Provides an overview of health care information systems, legal and ethical issues in health care, compliance and regulatory requirements, coding of health care data, quality management, HL7, data security, and HIPAA. Explores major applications and commercial vendors, decision support methods, evaluation of health-care information systems; and new opportunities and emerging trends.

EDC 547: Instructional Computing I

Students use instructional computing applications and understand the roles and uses of computers in instruction. Students select and use instructional computing hardware and software appropriate to instructional goals and settings. Students use electronic networks for instructional purposes. Students demonstrate skill using basic productivity software through structured assignments and collaborative projects.

EDC 548 Instructional Computing II

Students develop skill in advanced aspects of the operation and use of the range of instructional technologies from desktop to distributed computing environments. Students use operating systems, learn network administration, do technology planning, and work with basic authoring tools. Skill is demonstrated through a series of projects including development of a technology plan for a specified work setting and authorship of a prototype program.

Prereq: EDC 547, or consent of instructor.

*ICT 550, Security Informatics

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

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.

MAS 555, The Internet and Social Change

A critical examination of the political, cultural, technological, social, and behavioral aspects of Internet-mediated communication. Emphasis on research literature and theory on emerging platforms of new media technologies and applications.

Prereq: MAS 300 or consent of instructor.

STA 580, Biostatistics I

Descriptive statistics, hypothesis testing, paired and unpaired tests, ANOVA, contingency tables, log rank test, and regression with biostatistics applications.

Prereq: MA 109 or equivalent.

*ICT 596, Internship in ICT

Supervised lab work in ICT with meetings for evaluation of student's work, technique and review of issues.

Graduate

ICT 600/LIS 600, ICT in Society

An introduction to the nature of information (both utilitarian and aesthetic) in contemporary society, and to the role played by libraries and other information organizations in disseminating that information. Emphasis is on developing perspective.

HSM 601, Overview of U.S. Healthcare

An introduction to the health care delivery system in the United States, including its composition, functioning, the interrelationships of organizations and professional groups within the system in various settings, health care terminology, and major problems and issues in the delivery of health services.

Prerequisite: MHA/MPA program status.

*ICT 602/LIS 602, Information Representation and Access

An introduction to the theory and practice of how information is represented and accessed in electronic systems. Topics may include information description, access, control and organization; formulation of effective search strategies and evaluation of information sources.

HSM 602, Organizational Change and Strategic Planning

This course is designed to focus on the future needs of the health care organization as contrasted to day-to-day operational management. Strategies for the design and

implementation of organizational change including techniques of quality and process improvement will be addressed. The strategic planning components of needs assessment, demands analysis, generation of alternative, priority setting and evaluation form the basis of the course. Several health care trends such as restructuring, innovation in health care delivery and financing, and performance measurements will be illustrated through case analysis in a variety of provider settings.

Prereq: HA 601 and HA 621.

ICT 605/LIS 605, Information Policy & Technology Regulation

Examination of the three models of regulation by which society govern communication and information, and the problems and opportunities brought about by technological changes to media.

Prereq: ICT 600 or consent of instructor.

ICT 607 Introduction to Leadership in Information Professions (3 hrs, in progress)

An introduction to leadership concepts in the context of information communication technology organizations and structures.

ICT 610/CJT 610, Participatory Communication

This seminar will provide students with a state of the art account of the underlying philosophical, theoretical, and methodological premises of participatory communication. This will help students gain a deep understanding of participatory communication theory and research, and their implications for such contexts as management and organizational communication, health communication, international development, journalism, democracy and civic engagement, public policy, and communication with marginalized groups.

Prereq: At least one year of graduate study in communication or consent of instructor.

HSM 624, Information Systems in Health Care.

This course will focus on the life cycle approach to information systems development. Phases of this approach include systems analysis, design, implementation, maintenance and evaluation. This approach has a technological, financial, and human factors component. The decision making and planning role of administration as well as the need on how to maximize the utilization of current systems is stressed. Topics include the information needs of the strategic planning process, administrative function and clinical care. The course will involve site visits.

Prereq: HA 602 and 642.

ICT 626/LIS 626, Electronic Information Resources in the Health Sciences*

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.

ICT 627/LIS 627, Consumer Health Information Resources*

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.

CJT 630, Proseminar in Mass Media Law and Public Policy

Study of mass communication law and policy-making. Intensive review of court decisions, statutes and administrative rules and regulations regarding libel, privacy, public access to government meetings and documents, intellectual property, broadcast regulation, commercial and corporate speech, obscenity and protection of news sources.

Prereq: CJT 601 and graduate standing in communication or consent of instructor.

ICT 630/LIS 630, Info Retrieval

This course examines online information retrieval processes and services. It emphasizes searching commercially available online retrieval systems and databases and focuses on two major components of electronic searching strategies: the knowledge about system structure of electronic databases and the various strategies, models and approaches to online searching. The course contents cover the pre-search interview, query analysis, database selection, search strategy development, online protocol, and evaluation of search results. Current status of and future trends in the online industry are also discussed.

Prereq or concurrent: LIS 601, LIS 602 or ICT 601 or consent of instructor

LIS 634, Information Architecture*

The course introduces the concepts and practices of information architectures (IA) for a Web site within the context of the organization it serves. It aims to acquaint students with principles and process of information architecture for user-centered design of websites. It also provides students the opportunity to develop practical skills related to the design of information organization and navigation systems. The course prepares students for the companion technical course of "content management systems" where they will apply the theories and techniques studied in this course to the implementation of a fully functional website.

ICT 637/LIS 637, Information Technology

Study of computer and communication technology used in modern information storage and retrieval systems. Consideration also given to managing microcomputer services, hardware evaluation and selection, and system security.

Prereq: Consent of instructor.

*ICT 638, Advanced Web Design (this course will be based off an existing course in Library Science and tweaked for Information Communication Technology)

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.

ICT 640/LIS 640, Health Information Resource Services

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.

*ICT 651, Technology Security

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/LIS 658, Knowledge Management

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.

ICT 668/LIS 668, Information Systems Design

Study of concepts and methods of information system design and development with particular relevance to library and information center applications. Emphasis is given to modeling of system functions, data, and processes of computer-based information systems including the development of small scale information systems.

CJT 671, Proseminar in Health Communication

This course is designed to provide a broad introduction to communication in a health care context. Topics addressed are patient-provider communication, small group communication, communication in health care organizations, intercultural communication in health care, and health images in the mass media.

Prereq: Graduate standing in communication or consent of instructor.

*ICT 596, Practicum

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 (140) 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. Can be repeated for up to 6 credit hours.

CJT 726 Communication Leadership Studies

The primary purpose of this is course is to extend students' theoretical understanding of leadership from a communication perspective. Specifically, this course is designed to (1) sharpen the students' understanding of the role of communication in developing effective leadership behaviors; (2) familiarize students with leadership as it relates to the communication process; (3) involve students in major term projects which incorporate current

leadership theory and research; and (4) enhance students' understanding of published research in leadership communication.

CJT 730, Seminar in Mass Media and Public Policy

The role of mass communications media in making public policy and the effects of public policies on the mass media. One subject area will be investigated each semester; typical topics are (1) political campaign communications; (2) censorship; (3) controversial public issues; (4) rights; (5) international and world agreements. May be repeated to a maximum of six credits under a different subtitle.

Prereqs: CJT 630 and graduate standing in communication or consent of instructor.

CPH 752 Leadership in Public Health

This course is designed to explore the dimensions of leadership as presented in both the traditional and contemporary literature. It focuses student understanding on their leadership qualities and the ways to apply them in the current public health environment. Prereq: consent of instructor.

ELS 602 Leadership in Professional Learning Communities

ELS 602 is the study of professional learning communities with emphasis on essential roles of collaborative leaders (i.e., principals,teachers, students, parents) in creating and sustaining continuous improvement of student-learning.

EDL 665 School Technology Leadership for Digital Citizenship

This course examines school administrators' social, ethical, and legal issues and responsibilities all students, including those with disabilities and special needs, for digital citizenship. Facilitating understanding of evolving virtual school environments and modeling digital citizenship at the school, district, and state levels are also addressed. Prereq: Admission to the program or consent of instructor

new course

Resources and Staffing

The School's Director, initially, will serve as Director of Graduate Studies for the ICT program. This is consistent with the existing administrative structure of the School in which the Director also serves as Director of Graduate Studies.

To the greatest extent possible, the ICT program will draw upon existing courses, both within the College of Communication and Information as well as courses offered by other colleges across the University. This will help eliminate duplication of effort and reduce the overall resources needed to support the program.

Current CCI faculty members qualified to teach ICT courses include:

Jeff Huber (LIS) – health information, information retrieval (Ph.D. Library Science)
Namjoo Choi (LIS) – information technology, information systems (Ph.D. Informatics)
Ning Yu (LIS) – data mining, social media, information retrieval (Ph.D. Information Science)
Sujin Kim (LIS) – biomedical informatics, information retrieval (Ph.D. Library and Information Science)
Joe Miller (LIS) – information technology (MSLS Library Science)
Lisa O'Connor (LIS) – information in society (Ph.D. Cultural Foundations)
Shannon Oltmann (LIS) – information policy (Ph.D. Information Science)
Donald Case (LIS) – information in society (Ph.D. Communication)
Sherali Zeadally (LIS) – computer networking, network security (Ph.D. Computer Science)
Michael Tsikerdekis (LIS) – information technology (Ph.D. Computer Science)
Jasmine McNeally (LIS) – information policy (J.D.; Ph.D. Mass Communication)
Alyssa Eckman (ISC) – graphic design (Ph.D. Communication)
Bobi Ivanov (ISC) – mass media communication (Ph.D. Communication)
Chan Yoo (ISC) – consumer behavior and marketing communication (Ph.D. Advertising)
Kakie Urch (JOU) – web publishing, social media (MA American Literature/Mass Culture)
Yung Soo Kim (JOU) – visual communication, photojournalism (Ph.D. Mass Communication)
John Clark (MAS) – telecommunications, information technology (MA Communication)
Jim Hertog (MAS) – mass communication (Ph.D. Mass Communication)
Zixue Tai (MAS) – multimedia, interactive gaming, global communication (Ph.D. Mass Communication)
Shari Veil (COM) – risk and crisis communication, community preparedness (Ph.D. Communication)
Tim Sellnow (COM) – risk and crisis communication, organizational communication (Ph.D. Communication)
Deanna Sellnow (COM) – instructional communication (Ph.D. Communication)
Derek Lane (COM) – instructional communication, interpersonal communication, team-based learning (Ph.D. Communication)
Elisia Cohen (COM) – health and risk communication, media effects (Ph.D. Communication)
Don Helme (COM) – health communication, health campaigns (Ph.D. Communication)
Laura Stafford (COM) – interpersonal communication, relational communication (Ph.D. Communication)
Patric Spence (COM) – risk and crisis communication (Ph.D. Communication)
Matthew Savage (COM) – health communication, interpersonal communication (Ph.D. Communication)
Brandi Frisby (COM) – interpersonal communication, instructional communication (Ph.D. Communication)
Anthony Limperos (CIS) – instructional communication, interactive gaming (Ph.D. Communication)

Chas Hartman (CIS) – instructional communication, social media (Ph.D. Communication
Troy Cooper (CIS) – instructional communication, visual communication (Ph.D. Communication)
Raj Gaur (CIS) – instructional communication, mass communication (Ph.D. Communication)

Faculty of Record

Since the ICT program is being proposed as an academic program housed in the School of Library and Information Science, ICT program faculty will be members of the LIS faculty and subject to the existing School of Library and Information Science Operating Rules and Procedures of the Faculty. The School's rules state:

> The faculty of the school consists of the Dean of the College, the Director of the School, and the members of the faculty of the College who have been assigned duties in the School (Gov Regs, VII-5). Membership on the councils and committees of the school, with or without voting privileges, may be extended by the school faculty to any other person assigned to it for administrative work, teaching, or research. Membership on the School councils and committees will normally be extended to non-faculty in the school by a vote of the faculty at the first meeting of each academic year, following a nomination from the floor for that purpose.

Faculty of record for the ICT program initially will include all SLIS faculty members:

Jeff Huber (LIS) – health information, information retrieval (Ph.D. Library Science)
Namjoo Choi (LIS) – information technology, information systems (Ph.D. Informatics)
Ning Yu (LIS) – data mining, social media, information retrieval (Ph.D. Information Science)
Sujin Kim (LIS) – biomedical informatics, information retrieval (Ph.D. Library and Information Science)
Lisa O'Connor (LIS) – information in society (Ph.D. Cultural Foundations)
Shannon Oltmann (LIS) – information policy (Ph.D. Information Science)
Melissa Adler (LIS) – information tagging, organization (Ph.D. Library and Information Studies)
Sean Burns (LIS) – information technology, information systems (Ph.D. Information Science and Learning Technologies)
Maria Cahill (LIS) – information technology (Ph.D Library and Information Science)
Youngseek Kim (LIS) – eScience, data science (Ph.D. Information Science and Technology)
Sherali Zeadally (LIS) – computer networking, information security (Ph.D. Computer Science)
Michael Tsikerdekis (LIS) – information technology (Ph.D. Computer Science)
Jasmine McNeally (LIS) – information policy (J.D.; Ph.D. Mass Communication)

Newly hired SLIS faculty members will automatically participate as faculty of record will full voting rights since the ICT program is being proposed as an academic program within the School of Library and Information Science. We began consulting with Dean Blackwell in general about the program proposal July 2012. This discussion included qualifications of current and future faculty as well as the formation of the graduate faculty.

Faculty members from other units in the College of Communication and Information as well as those from other colleges contributing courses to the program will not be considered faculty of record and will not have voting rights unless membership is extended on a case by case basis and approved by the SLIS faculty.

	Year 1	Year 2	Year 3	Year 4	Year 5
ICT 600 ICT in Society			2	4	4
ICT 602 Info Representation and Access			2	4	4
CJT 726 Communication Leadership Studies			2	4	4
ICT 607 Introduction to Leadership in Information Professions					
ICT 505 Issues in Information and Communication Tech Policy		2	3	3	3
LIS 539 Intro to Medical Informatics				1	1
ICT 640 Health Info Resource Svcs					1
ICT 596 ICT Practicum					2
ICT 550 Content Management Systems					1
LIS 634 Information Architecture					1
ICT 658 Knowledge Management					1
ICT 507 Copyright			1	1	1
ICT 552 Cybercrime,...and Dig Law Enforce				1	1
ICT 506 e-Commerce Regulation				1	1
ICT 596 Practicum					2
ICT 510 Privacy				1	1
ICT 550 Security Informatics				1	1
ICT 630 Information Retrieval			1	1	1
ICT 651 Technology Security					2
ICT 615 Community Informatics					
ICT 668 Info Systems Design			2	2	2
IS 605 Info Policy and Regulation					1
Course releases to dev for following yr & mrkt program	2	5	5	3	
Masters courses to be developed			5	3	2
Total Sections Needed	2	7	23	30	37
Faculty Totals					
Regular Title Series	2	4	7	10	14
Lecturer Series	1	2	4	4	5
Part time	3	3	6	12	8
Staff Totals					
Student Affairs/Mrkt	1				
IT		1			
Primarily ICT but also School based employees					
Total Hires	4	4	5	3	5

The ICT undergraduate major has now received final CPE approval. It will begin rollout in Fall 2014 and continue build out until it is fully operational in Year 4. The ICT master's program will begin rollout in Year 4 and will continue build out until it is fully operational in Year 5. The rollout will coincide with the University's migration to a new financial model. The College will dedicate existing TIIF funds as an investment in the ICT program during Years 1 and 2. Year 1 of the rollout will coincide with UK's parallel process year in which the University will maintain operation under the existing financial model and dual operation under the new value-based model to ensure a smooth transition to the new financial model. By Year 3, the ICT program will be self-sustaining based on the tuition revenue it generates.

The CCI Dean's Office has funded 2 new ICT Regular Title faculty lines (1 Policy and Regulation and 1 Technology and Analytics) beginning Fiscal Year 2013-2014 on a recurring basis. The Dean's Office has also set aside funds to build 3-4 new faculty offices in the suite occupied by the School of Library and Information Science during the 2012-2013 Academic Year. In addition, the Dean's Office has set aside funds to refurbish space for an ICT lab to support the program. CCI leadership will work with UKIT and the Provost Office of Resource Management to identify potential space to house the ICT lab.

SWOT Analysis

Undergraduate Major in Information Communication Technology
(Emphases in ICT Commercialization and Technology Management)

Master's in Information Communication Technology – traditional and 3+2
(Emphases in Health ICT, Technology & Analytics and Law & Policy)

Strengths

-Little true competition in-state; with exception of NKU, all are either highly computer-focused or don't deal in the range of theory and application proposed for our program:

- **NKU**: Business informatics, Computer Information Technology, Library Informatics, Media Informatics, Health Informatics master's. Looks impressive from outside, but questions remain on quality of product.
- **KSU**: Applied Information Technology
- **Murray**: Minor in Computer Information Systems
- **WKU**: Business Informatics
- **Asbury**: Multimedia (competition for commercialization emphasis only)
- **Bellarmine**: Design, Arts and Technology

-Broad range of faculty expertise.
-Much stronger research foundation than any other KY program
-Opportunity for collaboration across campus (At master's level, proposing inclusion of courses from Health Sciences, Statistics, Education, Biomedical Sciences and Public Administration. At undergrad, B&E's Analytics program is on hold.)
-Limited competition in surrounding states: Most are more technology focused and less about application/use of technology

Weaknesses

-Real and perceived infrastructure limitations: We don't "look" high tech; increasing concerns about ability of campus computing infrastructure to support growing demands
-Limited capacity to add courses with current faculty: Coming budget cuts/personnel reductions will exacerbate this. Need a minimum of four new lines (two senior, two junior) within first two-three years of program.

Opportunities

-Career prospects for students with this expertise:
The U.S. Department of Labor (USDL) projected growth rates for employment in the ICT sector trends favorably for the ten-year forecast period. Employment projections in most job categories reflect double-digit percentage increases over that term. Employment availability in two categories (Information Security Analysts, Web Developers, and Computer Network Architects (107%); Media and Communication Workers, All Other (148%)) already exceeds the projected numbers for 2020.

Threats

-Limited knowledge of this field among prospective students and parents: But, strong interest in the IS minor during most recent summer registration sessions.

Employment Outlook

The U.S. Department of Labor, Bureau of Labor Statistics does not include a code specific to ICT. Rather it is necessary to glean this data from other categories such as those related to *Computer and Mathematics*, *Media and Communications*, and *Education, Training, and Library Occupations*. Note that the Bureau's category of 'Software Developers and Programmers' is not included below. The items listed below are general categories. Specific job descriptions may require other qualifications such as programming experience or a computer science degree.

Table 1. Employment Projections, U.S. Department of Labor, Bureau of Labor Statistics*

2010 National Employment Matrix title	Number* 2010	Number* 2020	Job openings due to growth and replacement
Computer Systems Analysts	544.4	664.8	222.5
Database and Systems Administrators and Network Architects	458.0	588.5	207.9
Computer Support Specialists	607.1	717.1	269.5
Information Security Analysts, Web Developers, and Computer Network Architects	302.3	367.9	110.3
Technical Writers	49.5	58.0	18.3
Media and Communication Workers, All Other	32.5	36.2	12.4
Media and Communication Equipment Workers, All Other	18.2	18.2	3.3
Instructional Coordinators	139.7	166.9	58.1
Education, Training, and Library Workers, All Other	112.3	126.7	39.2

*Numbers in thousands

Table 2. Analysis of U.S. Department of Labor Projections

Job Categories	2010 ('000)	2020 ('000)	Projected 10-Yr Growth Rate (%)	Projected Average Annual Growth Rate (%)[1]
Computer Systems and Business Analysts	544,4	664,8	22	2
Database and Systems Administrators and Network Architects	458,0	588,5	28	3
Computer Support	607,1	717,1	18	2
Information Security Analysts, Web Developers, and Computer Network Architects	302,3	367,9	22	2
Technical Writers	49,5	58,0	17	2
Media and Communication Workers, All Other	32,5	36,2	11	1
Media and Communication Equipment Workers, All Other	18,2	18,2	0	0
Instructional Coordinators	139,7	166,9	19	2
Education, Training, and Library Workers, All Other	112,3	126,7	3	1

[1.] Growth rate relative to base year (2010), non-compounded.

The U.S. Department of Labor (USDL) projected growth rates for employment in the ICT sector trends favorably for the ten-year forecast period. Employment projections in all but one of the identified ICT job categories reflect double-digit percentage increases over that term. The projected average annual growth rate, relative to the base year, is positive across all the major job categories (approximately 2%). These optimistic projections suggest that the Federal Government anticipates a stable, expanding ICT job market over the forecast horizon.

Table 3. Comparison of U.S. Department of Labor Statistics with Job Advertisements on Commercial Jobs Databases

Job Categories	2010 ('000)	2020 ('000)	Aggregate Snapshot of Job Ads: Feb 14, 2012[1]	Comparative Ratio[2] (%)
Computer Systems and Business Analysts	544,4	664,8	211,3	32
Database and Systems Administrators and Network Architects	458,0	588,5	211,2	36
Computer Support Specialists	607,1	717,1	49,4	7
Information Security Analysts, Web Developers, and Computer Network Architects	302,3	367,9	391,9	107
Technical Writers	49,5	58,0	10,8	19
Media and Communication Workers, All Other	32,5	36,2	53,5	148
Media and Communication Equipment Workers, All Other	18,2	18,2	7,3	40
Instructional Coordinators	139,7	166,9	37,3	22
Education, Training, and Library Workers, All Other	112,3	126,7	61,6	49

[1.] The snapshot is derived from the analysis of three commercial jobs databases: *oodle.com, simplyhired.com,* and *indeed.com* accessed on February 14, 2012. Details of the number of jobs advertised in each database for the respective categories may be found in Appendix A.

[2.] The comparative ratio is computed as a percentage of the 2020 projected value in each job category.

A snapshot of current ICT sector job advertisements was compared to the USDL employment projections for 2020 to evaluate actual current market performance against forecasts. Current employment opportunities in all categories are significantly outperforming USDL projections, which bodes well for current and future ICT graduates. Employment availability in two categories (Information Security Analysts, Web Developers, and Computer Network Architects (107%); Media and Communication Workers, All Other (148%)) already exceeds the projected numbers for 2020. Employment opportunities for Education, Training, and Library Workers, and Media and Communication Equipment Workers have reached 49%, and 40%, respectively, and are discernibly on track to surpass the USDL projections prior to 2020.

This expansion in the ICT sector-job market can be attributed to a variety of robust initiatives being undertaken in the public and private sectors. Retailers are aggressively shifting more of their business online to circumvent high operating costs (e.g., facilities costs, staffing) and to expand customer reach. The accelerated pace at which the Government is introducing regulatory mandates is serving as a catalyst for increased IT spending by organizations to ensure compliance. The financial and banking industry serves as an example of a sector that has come under heightened government scrutiny since its collapse, resulting in increased government mandates and regulations. And finally, social media continues to exert extensive influence in the public and private sector. Trained professionals are constantly in demand to integrate evolving social media tools into the organization's IT ecosystem, and to leverage and optimize social media presence online.

Graduates of the ICT master's program would be well suited for upper management positions that need to apply, manage and evaluate technologies such as a Chief Digital Officer, HIPAA Compliance Officer, Information Technology and Security Officer or positions in project management or information policy. While some career paths (e.g. Chief Digital Officer) are relatively new, companies such as Ernst & Young, Lockheed Martin, Verizon, etc., have employed project managers to oversee large scale technology deployment for many years.

Appendix A[1]

Individual Job Titles	Monster .com	dice. com*	Careerbuilder .com*	Job Central	indeed .com	oodle .com	simply hired.com
Computer Systems Analyst	936	4,266	10,815	500+	36,005	34,746	55,038
Business Analyst	1000+	11,969	18,735	500+	110,208	87,577	156,261
		16,235	29,550		146,213	122,323	211,299
Database Administrator	881	2,757	2,466	500+	16,886	51,528	43,174
System Administrator	1000+	5,468	6,635	119	47,088	147,183	88,849
Network Architects	152	2,449	1,271	500	11,500	12,442	24,892
		10,674	10,372		75,474	211,153	156,915
Computer Support Specialists	248	1,181	6,040	40	29,310	26,098	49,432
Information Security Analyst	196	1,916	4,589	173	21,827	9,160	49,144
Web Developers	1000+	13,913	7,764	349	69,913	173,233	330,254
Computer Network Architects	127	989	1,111	500	5,296	7,550	12,586
		16,818	13,464	1,022	97,036	189,943	391,984
Technical Writers	271	592	1,055	322	7,132	6,484	10,776
Media and Communication Worker	49	4,079	319	89	53,481	3,998	2,412
Media and Communication Equipment	49	253	111	17	7,269	569	553
Instructional Coordinators	9	17	134	57	1,653	37,301	8,087
IT Training Specialist	23	1,119	6,975	175	26,472	83,529	61,625

[1.] Monster.com, dice.com, and careerbuilder.com were excluded from the sample because they limit the amount of information they provide in the search results.

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[i] U.S. Department of Labor, Bureau of Labor Statistics. Employment Projections Employment by occupation. Table 1.2 Employment by detailed occupation, 2010 and projected 2020. http://www.bls.gov/emp/ep_table_102.htm. Accessed February 6, 2012.

ICT Competitive Analysis

Programs within Kentucky that prospective students might consider as options:

State schools

Northern Kentucky
Programs in College of Informatics
College of Informatics http://informatics.nku.edu/
Business Informatics (B and M): AACSB-accredited.
http://informatics.nku.edu/bis/undergraduate/index.php   Largely programming and structure based.
Computer Information Technology major: http://informatics.nku.edu/departments/computer-science/programs/bscit.html   "By choosing one of two tracks, Web development or network/system administration and security, you will be prepared to enter the workforce with a broad array of skills applicable to an ever-increasing variety of jobs." Programming based.
Library Informatics. http://nkuonline.nku.edu/undergraduate/libraryinformatics/index.php
The Bachelor of Science in Library Informatics (BSLI) program at NKU is designed for those students who want to better understand the relationships among people, information, and technology. The program provides a strong foundation in the knowledge base and professional philosophy of information and library science.
Media Informatics: http://informatics.nku.edu/departments/communication/programs/min.html
"Media Informatics brings together skills in writing, audio, interactive Web design, 3d animation and virtual worlds to create a rich life on the screen."
Health Informatics master's. 18 credit core; electives in three areas: policy, business process management, knowledge management. http://informatics.nku.edu/departments/business-informatics/programs/mhi.html

Kentucky State
Applied Information Technology program
Computer science/hardware based.
http://www.kysu.edu/academics/collegesAndSchools/collegeofmathematicssciencestechnologyandhealth/computerandtechnicalsciences/bsAppliedInformationTechnology.htm

Murray State
Minor and "area" in Computer Information Systems
Area: "The emphasis is on business computing. Students take all the business classes (marketing, management, accounting) that form the business "core" and enhance that education with a variety of technical courses commonly used in a wide variety of businesses. Inter-personal and group communication is stressed in most of the upper level classes. One way of distinguishing this discipline from the others in the CSIS department is to view these people as Analysts - they analyze Business requirements, evaluate alternative technologies and present optimal solutions to Business managers. Their strength lies in their ability to apply state of the art "technologies" to help people become more productive."
http://www.murraystate.edu/Academics/CollegesDepartments/CollegeOfBusiness/Programs/CSIS/CSISprograms/AreaInComputerInformationSystems.aspx

Western Kentucky
Business informatics: http://www.wku.edu/information-systems/bachelor-of-science-in-business-informatics.php

Private Schools

Asbury
Multimedia program
Multimedia program: "Our multimedia program is not just an emphasis that focuses solely on learning new computer programs. Our goal is to teach students how to think creatively. It is also as much about problem-solving as it is about creative design. Students gain real studio experience, working individually and in teams with actual clients to design, organize, and create interactive multimedia that visually tell a story." http://www.asbury.edu/academics/departments/mediacom/learning/multimedia
Facilities: http://www.asbury.edu/academics/departments/communication-arts/facilities

Bellarmine
Design, Arts and Technology program
http://www.bellarmine.edu/cas/DAT.aspx
Upon completion of the BA in Design, Arts and Technology, graduates will have demonstrated the ability to:
Apply a wide variety of contemporary multimedia technologies.
Create original multimedia work that demonstrates an understanding of aesthetic principles and meets professional standards of craft, content and presentation.
Collaborate in the production of a capstone multimedia product.
Integrate the theory and skills of the disciplines of art, communication, music and technology into a cohesive body of knowledge.

Pikeville
MIS Program

Programs in Surrounding States

OHIO

Bowling Green
Visual Communication Technology:
http://www.bgsu.edu/colleges/technology/undergraduate/vct/home.html

Learning Outcomes:
Upon completion of the baccalaureate degree, students in the visual
communication technology major are expected to:
-Demonstrate critical-thinking skills as they relate to solving visual problems;
-Conceptualize and implement a visual solution in several media modes;
-Demonstrate operational level skill ability in each of the visual media areas   of VCT;
-Research and produce an organized written rationale for using a specific
  medium to solve a specific visual problem;
-Apply knowledge of industrial applications to visual communication related   technologies.

Kent State
M.S. in Information Architecture and Knowledge Management: http://iakm.kent.edu/
School of Digital Sciences: http://www.kent.edu/dsci/undergraduate/index.cfm

Ohio University
McClure School of Information and Telecommunication Systems:
http://www.ohio.edu/mcclure/index.html. Primary focus is voice and data. UG and G.
Dept. of Management Information Systems. http://aspnet.cob.ohio.edu/isms/cobContent.aspx?1411

University of Toledo
Information Systems: http://www.utoledo.edu/business/COBI/AcademicPrograms.html

WEST VIRGINIA

Marshall University
College of Information Technology and Engineering: Master's in Technology Management with
emphasis options in environmental management, information security, information technology,
manufacturing systems or transportation systems and technologies
http://www.marshall.edu/cite/academics/Programs/PDescTmGCur.htm

INDIANA

Ball State University
Center for Information and Communication Science; master's program
https://sitecorecms.bsu.edu/Academics/CollegesandDepartments/CICS.aspx ; also has a 4-course
certificate:
https://sitecorecms.bsu.edu/Academics/CollegesandDepartments/Distance/Academics/Programs/Graduate/Certificates/ICS.aspx

Indiana University
BS, MS, PhD Informatics http://www.soic.indiana.edu/prospective/informatics.shtml
Grad certificate, Information Architecture http://www.slis.indiana.edu/degrees/arch.php
MPA Information Systems
http://www.indiana.edu/~spea/prospective_students/masters/masters_degrees/mpa/Information%20Systems.shtml

TENNESSEE
University of Tennessee Knoxville
Minor in Information Studies and Technology http://www.sis.utk.edu/minor
M.S. Information Sciences http://www.sis.utk.edu/programs/masters

NORTH CAROLINA
University of North Carolina at Chapel Hill
B.S. Information Science http://sils.unc.edu/programs/undergraduate/bsis
M.S. Information Science http://sils.unc.edu/programs/graduate/msis

University of North Carolina at Charlotte
M.S. Information Technology with concentrations in advanced data and knowledge discovery, human-computer interaction, information security and privacy, information technology management, software systems design and engineering http://sis.uncc.edu/?q=content/graduate-msit
Grad certificates in Management of Information Technology http://sis.uncc.edu/?q=content/certificate-management-information-technology; Information Security and Privacy
http://sis.uncc.edu/?q=content/certificate-information-security-and-privacy; Healthcare Information Technology, http://hit.uncc.edu/hit/healthIT/requirements/

VIRGINIA
George Mason University School of Engineering
B.S. Information Technology https://ait.gmu.edu/student/it_major
M.S. Applied Information Technology https://ait.gmu.edu/student/ms_degree

ILLINOIS
University of Illinois Champaign-Urbana
Minor in Informatics https://www.informatics.illinois.edu/display/infominor/Home

MISSOURI
University of Missouri-Columbia
B.S. in Information Technology http://engineering.missouri.edu/cs/degree-programs/bs-it/

MICHIGAN
Michigan State
ICT for Development emphasis **http://www.egr.msu.edu/ICT**
Information Technology specialization **http://tism.msu.edu/specialization-information-technology-it**
B.S. Media and Communication Technology, concentrations in media management and research, ICT
http://tism.msu.edu/tism/bachelor-science-media-and-communication-technology