UCC Program Review Committee summary of review

Program – School of Information and Telecommunication Systems

This program includes the following degrees, minors, and certificates:

- B.S.C. Information and Telecommunication Systems
- Minor in Information and Telecommunication Systems
- Master of Information and Telecommunication Systems

Recommendation

This program is found to be viable, see report for commendations, concerns, and recommendations.

Date of last review – AY 2007

Date of this review – AY 2017

This review has been sent to program director, his comments are attached.

This review has been sent to program college dean, he has no comment.

This review has been sent to the Graduate Council. They have “No additional comments on this excellent review”
Information and Telecommunication Systems
Program Review
November 14, 2016

Review Committee:

- **External Reviewer:**
  - Rayford Steele, Distinguished Professor, Information and Communication Systems, Ball State University

- **Internal Reviewers:**
  - John Cotton, Associate Professor Mechanical Engineering, Russ College of Engineering and Technology;
  - Fuh-Cherng Jeng, Associate Professor, School of Rehabilitation and Communication Sciences, College of Health Sciences and Professions;
  - C. Scott Smith, Associate Professor of Horn and Theory, School of Music, College of Fine Arts

**Executive Summary**

In coming to this conclusion, the review committee met with various groups of faculty, staff, and students in the School of Information and Technology on November 1 and 2, 2016, toured the facilities and reviewed the department’s self-study report. The review includes the following programs offered by the department:

- Bachelor of Science (B.S.) in Communication
- Minor in Information and Telecommunication Systems
- Master of Information and Telecommunication Systems (MITS)

The following report reflects the writing of the internal members of the review committee. During our site visit, we were joined by the external reviewer, Professor Rayford Steele who has a tremendous amount of experience and expertise in ITS program education and administration. Much of the internal reviewers’ reflections have been interpreted through discussion with Professor Steele. Professor Steele has also written a separate external review (attached) which we believe should hold great emphasis.

**Commendations**

- Students in both B.S. and M.S. programs were highly engaged and impressive during meetings with the review committee. Students enjoy a very good external reputation and are well placed for success in their careers.
- The faculty keeps the curriculum updated, which is essential to this subject area, and hands-on.
Concerns

- As the program looks to expand the M.S. program to be offered at the Dublin center, which appears to offer a fantastic opportunity to both OU and ITS, the review committee is concerned that the full resources needed regarding staff and support to make it a success will be available.
- As several faculty (and the sole 20-year administrative support person) approach retirement in the next few years, we are concerned with continuity of staffing.
- Reflective of the ITS profession in general, the undergraduate program is largely white and male.

Recommendations

- As faculty retire, adding an Assistant Professor who is strong in the area of security, may cost a salary roughly equivalent to two retiring professors, yet the risk to not pursue this area would limit the department going forward.
- ITS maintains excellent laboratory equipment for educational purposes, however, it risks damage to its equipment due to power outages. Its lab’s power needs to be the Schoonover Center’s emergency power generator.

The review committee found the undergraduate and graduate programs of J. Warren McClure School of Information and Telecommunication Systems to be viable.
Overall Program

a. Is the current number and distribution of faculty sufficient to carry out the broad overall mission of the Department (Teaching; Research, Scholarship and Creative Activity; Service)?

The department has 6 full time faculty and one early retired faculty member. While this number of faculty is sufficient, the review committee heard that the next several years will be a time of transition, with anticipated retirements of two faculty members (as well as administrative support.)

b. Is the level of the Department’s RSCA appropriate for the program given the size of the faculty and the resources available to the Department? Is the Department’s level of external funding at an appropriate level?

Discussions with the external reviewer as well as faculty and dean found the RSCA appropriate for the department.

c. Is the level of service, outside of teaching, appropriate for the program given its size and the role that it plays in the University and broader communities it interacts with? Is the Department able to fulfill its service mission?

Department members satisfactorily contribute to service throughout the university and the profession.

d. Does the Department have an appropriate level of financial resources, staff, physical facilities, library resources, and technology to fulfill its mission?

The deliberate planning of teaching laboratories during the construction of the Schoonover center as well as the McClure endowment have given the department excellent physical resources. Faculty reflected concern that the marketability of ITS makes salaries of faculty higher relative to another communications faculty. This fact raises concern that new hires will be costlier than currently anticipated.

Undergraduate Programs

a. Is the program fulfilling its service role, adequately preparing non-majors for future coursework and/or satisfying the needs for general education?
The School of Information and Telecommunication Systems (ITS) fulfills its service role by offering two general-education courses: ITS 2010 Understanding Internet Technology and ITS 4440 Lifecycle Management of Information and Telecommunication Systems. The Understanding Internet Technology (ITS 2010) is a Tier II course in Applied Science and Mathematics. This course is taught by a group I faculty member and is offered at least once a year. Course contents are well-organized in the standard format including lectures, discussions, and laboratory assignments. This course provides non-majors adequate preparation for future course work and for the purpose of general education. The Lifecycle Management of Information and Telecommunication Systems (ITS 4440) is a Tier III Equivalent course that satisfies the needs for general education.

b. *Is the program attracting majors likely to succeed in the program? Is the number of majors appropriate for the program? Is the program attracting a diverse group of students?*

The school is attracting a number of majors who have succeeded in the program, and is currently making additional efforts to increase student enrollment. These efforts include working with Admissions to prepare recruiting materials and campaigns, conducting targeted high school visits, and maintaining an active social media campaign. The school currently has a total of 87 undergraduate students. Although the number of undergraduate students in ITS has remained relatively stable during the past 3-4 years, the school is actively seeking methods to increase the visibility of the School and to increase student enrollment. There appear to be some challenges in dealing with central admissions, but these can presumably be resolved.

The ethnic diversity of the undergraduate students has been, to the large intent, a mirror reflection of the diversity of the regional population in the southeastern Ohio. The school currently has approximately 85% (i.e., 74/87) white, 5% (4/87) black, 1% (1/87) Hispanic, and 9% (8/87) other ethnic students. The gender diversity of undergraduate students is lacking. Currently, there are only 6% (5/87) female students in the ITS major. This lack of gender diversity has been persistent with this field long before the present review period and is systemic with the ITS discipline. Nonetheless, the School has strived to recruit female students through various activities, including the formation a Women in ITS group that meets regularly with people supporting women in STEM fields, participating with the Tech Savvy event sponsored by American Association of University Woman that brings in middle-school girls to campus for technology sessions, and seeking out female mentors to pair with female ITS students.

c. *Does the undergraduate curriculum provide majors with an adequate background to pursue discipline-related careers or graduate work following graduation? Are students able to move into discipline-related careers and/or pursue further academic work?*
The school reviews its curriculum on a regular basis. The ITS-required core courses and electives provide students with sufficient knowledge and skills to pursue ITS-related careers or graduate work after graduation. The IT field is highly dynamic. And with rapid changes of technology, business networking, and public policy that drive substantial changes in the business environment, the school and its Industry Advisory Board work together to ensure that the ITS curriculum supports student learning. The School has a large number of alumni; many of them are successfully in the industry and are very supportive to the school’s development. As a matter of fact, many of the ITS alumni and related industries hire ITS students regularly. The employment rate for our ITS students is high, as well as their ability to pursue a further academic degree in ITS. Based on the LinkedIn profiles, 95% of our ITS undergraduate students are either employed or in graduate schools.

**d. Are the resources and the number of and distribution of faculty sufficient to support the undergraduate program?**

Given the considerable teaching responsibilities, together with the needs to provide electives for ITS and non-ITS majors, the school is on the edge of having the appropriate number of faculty to cover all these courses. The school currently has 6 full-time group I faculty members and 1 early retired faculty member. While all the faculty members together can cover a total of 23 courses. The degree-specific courses add up to 21-22 courses, leaving only one or two teaching assignments for non-major general education courses.

**e. Are pedagogical practices appropriate? Is teaching adequately assessed?**

The school has appropriate pedagogical practices and their teachings are assessed adequately. Specifically, the school has pursued an approach consistent with the self-study requirements posted by Ohio University Curriculum Council, with an emphasis on measurements of students’ learning outcome. Adequacy of teaching is evidenced by satisfactory student evaluation and feedback at the end of each semester, as well as the high employed-rate of the ITS undergraduate students.

**f. Are students able to move into discipline-related careers and/or pursue further academic work?**

From our discussions in the previous sections and from the data on student outcomes in the self-study, approximately 95% of the ITS undergraduate students go into discipline-related positions in the workforce or onto graduate study. The school’s efforts to track their graduates and to use this information to assess its programs is remarkable.
Graduate Program

a. *Is the program attracting students likely to succeed in the program? Is the number of students appropriate for the program? Is the program attracting a diverse group of students?*

The Master in Information and Telecommunication Systems (MITS) program attracts qualified students who are likely to succeed in the program. The number of the residential MITS program is appropriate for the size of the program; however, the number of students in the online MITS program has been low for several years. The online MITS program and the MITS program in Dublin presents a major challenge for this program and are discussed in various sections of this report. The number of graduate students enrolled in the residential MITS program varies substantially, mainly due to the fluctuation of interests from international students and the visa availability for the various countries. The majority of the residential MITS students are international students – mainly from India and African nations. The MITS program has more ethnic and gender diversity than the ITS undergraduate program.

b. *Does the graduate curriculum provide an adequate background to pursue discipline-related careers following graduation?*

Yes, the graduate curriculum is appropriate and ensures that students have acquired adequate knowledge and skills to pursue ITS-related careers after completion of their degrees. During the Quarter-To-Semester switch, the school revised the program curriculum accordingly and is actively monitoring students experiences and making adjustments necessary to adapt for the rapid changes in the IT industry. The ITS Industry Advisory Board, in which a majority of the board members are ITS alumni, plays an important role in ensuring that the program curriculum meets the current needs of the IT industry.

c. *Does the program provide adequate mentoring and advising to students to prepare them for discipline-related careers?*

Yes, there is a constantly and ongoing intellectual interaction between graduate students and faculty members. Graduate students are actively engaged with faculty mentors in research. For example, in the ITS 6440 course, an ITERA Case Competition provides students opportunity to complete a capstone project that is directly related to a current issue in the ITS industry. Adequacy of mentorship and student advising is also evidenced by the high employment rate of students who graduated from the MITS program.
d. *Are the resources and the number of and distribution of faculty sufficient to support the graduate program?*

With the residential MITS program, the resources and number of faculty members in the school is adequate. However, the current resources and number of faculty do not seem sufficient to support the online MITS program and the MITS program in Dublin. Currently, the online MITS program is administered through a dual-teaching methodology, where the residential and online students join the same lectures synchronously.

e. *Does the program offer appropriate financial support to graduate students?*

Yes, the financial support appears to be within discipline norms. The program utilizes funding resources from the university and outside resources, such as endowments and donations from alumni and various fundraising activities hosted by the school.

f. *Are students able to move into discipline-related careers?*

As mentioned in the previous sections, measures of student success indicate that students are quite successful in moving into discipline related careers. The MITS program at Ohio University has a good reputation in the fields. Several ITS-related industries, such as Progressive Insurance, Nationwide Insurance, and Cincinnati Bell, employ ITS students on a regular basis.
Outside Reviewer Comments

1. The self-study was very carefully done and it was unusually comprehensive. The quality of the content was clearly reflected as we conducted the on-site interviews.

2. The onsite interviews reflected enthusiasm from students, staff and faculty as well as realistic candor and a commitment to achieve within available resources for this program.

3. The facilities are now a significant asset after the move to the Schoonover Center. The labs space is both useful in design and very reasonably equipped from a quality perspective. The quantity and breadth of labs equipment, for a program with both an undergraduate and graduate population even of the current size is modest. This is a broad and rapidly evolving field which is very technology centric and, thus, this area is a constant challenge, but it is central to program credibility, student attraction and faculty support. Maintaining up to date technology with sufficient access for students, with differing demands at the undergrad and grad levels is essential to a good educational experience in this field and to program competitiveness when attracting students, faculty and industry partners, especially for jobs for graduates.

A small but glaring deficiency for the labs was the lack of a power circuit connecting labs power to the buildings emergency power generator. This may appear insignificant for a non production computing facility but it is not. To risk both labs data and equipment in an emergency of any significance is simply not a responsible or cost effective choice. It also damages the credibility of a professionally oriented academic program by being a bad practice for the field. It costs relatively little to fix and it will positively impact labs/data security and credibility. It should be connected soon.

4. The specific challenge of looking at any specialized, professionally oriented, and interdisciplinary and hands on labs oriented undergrad or graduate program is found in its context.

The McClure School of Information and Telecommunication Systems has long been a peer respected program for decades. Before there was a graduate program this outside evaluator was recruiting undergrads for my own masters program from ITS because they were a steady source of well-prepared students whose quality rarely varied. The industry response was similar.

From everything witnessed during this review that has not changed. The quality of program elements from up-to-date curriculum, industry involved learning, committed faculty appropriate hands-on labs experiences, and professional challenges which keep students motivated are all still there. The results still include excellent job opportunities at higher than typical salaries, highly engaged students who are genuinely enthusiastic about their program, the faculty and their experience, and a loyal alumni, who are reasonably engaged and supportive and industry partners willing to be involved and helpful.

The challenge for the undergrad program is not uncommon; it is sustaining significant size and maintaining reasonable expectations within the Scripps College and the university.

Here is where context is critical. ITS is by far the smallest, by faculty and by enrollment numbers of the four units in the college and its cost is one of the highest.
On the national scene, in terms of context, this hybrid academic field mixes applied technology which is both a dominant social and economic influence, with business which is driven by the digital technologies, with the understanding of applied human communication in organizations from government to education to healthcare and beyond.

In short, these interdisciplinary programs are mission critical in a relatively new digital driven era in which technology brings rapid change and uneven disruption to the status quo.

Anyone who has any significant academic experience knows that interdisciplinary programs are highly valued for their potential to contribute to our complex society and yet they are the most threatened units in academe because they are not discipline pure, they are not easy to understand or to communicate and they are not inexpensive.

Enrollment tends to vary a bit with the uneven waves of industry growth and then new market disruption. It is critical to maintain the investment in enrollment development outside and visibility and student “feeder” relationships inside a university to minimize the impact on program numbers. It is equally critical to keep curious and willing college and university administrators informed to assure that expectations are not unrealistic.

As the founding chair of the board of IUTERA, the leading association for this field, I can attest that the ITS enrollment challenges are fairly similar to programs across the country. The relative cost issues are also similar and very market driven by a field that on occasion still sees a graduate start to work in the industry at a salary competitive with a valued senior professor.

The very good news is that the ITS program quality ranks in the top tier (top 10-15% of programs) in this relatively small field of hybrid programs, by almost any measure.

To address this ITS undergrad enrollment and expectations challenge there are four steps you may wish to consider.

1. College and Provost Office participation in briefing and update efforts by ITS is essential to realistic expectations and to understand the strategic opportunity that a STEM program and associated mission critical program offers in outside development and service/political areas. Also a successful alumni groups influence and economic impact is a leverageable asset not fully utilized.

2. College and university based enrollment efforts must include and capitalize on this “opportunity” program. While English, Sociology, History and other foundation courses are critical to a solid education, today societal expectations look for outcomes and ITS represents high employment, good economic return on tuition invested, and long term career success as well as high impact on societies future. ITS needs focused help here.

3. ITS must make even more efforts, especially inside the university, to create feeder opportunities to attract students at the sophomore or later stage to their program. This takes
time, resources and creativity but because of the physical location of the university it is a major opportunity zone for enrollment growth at the undergrad level.

4. All the above sounds nice, and ITS has not ignored these efforts in past, they are simply resource strapped. Who is to do all this and keep everything else going? To succeed in the above require more focused efforts from an already stretched Director, faculty with very full plates, including extensive advising at undergrad level time commitments and current efforts dependent on well-intended work study students and one key staffer trying to juggle more balls than is realistic. The good news is this team did not complain. The bad news is that without reasonable resources this critical area will see little change unless they just get lucky... not a small way to evolve a “diamond in the rough” opportunity unit at OU.

All the above applies to the MITS graduate program but there is a different context and a very different opportunity to consider. While the addition of the graduate program has led to a reasonably qualitative result, it has resulted in qualitative challenges with lower than desired enrollment and significant dependence upon international student enrollees.

The student and faculty commitment and attitude are very positive and results, though limited, are good. Thus, the foundation is sound.

The opportunity is three-fold and begins with the Dublin initiative.

There is a significant corporate base with significant and obvious ITS related needs in apparent state of market readiness to be recruited for MITS level education and special learning opportunities.

This is a strategic match for the overall OU initiative in Dublin but to succeed it will require strategic resource use in developing what could become a solution to MTIS enrollment, jobs development opportunity, certificate and executive education and feeder possibilities at the undergrad level.

The challenge is simple, yet like all good opportunities, comes with a bit of risk... though actually limited in this context.

To succeed in Dublin, ITS cannot realistically stretch its resources further without real risk to basic operations.

The fact is that ITS, by any standard that I know, is operating at about 2/3 to ¾ level resource base to do its current tasks, and limping a bit to keep up. Lose one staff or faculty person and this unit is at serious risk.

Another fact is that this is a “graying” unit with more retirements on the horizon than are sustainable should they happen sooner than expected or more than one in the same year.

However, if the college and the university are strategic in facing these facts, there is real potential to address multiple needs and with fairly short term risk.
Using the Dublin opportunity as the short term reason and the “graying” issue as an interim opportunity the recommendation is as follows.

1. Dedicate real ITS resources. A full faculty equivalent and significant portion of staff backup to Dublin development with industry partners.

2. Bring on a very “market critical” talent (one faculty with special capacity in the security area) which can be leveraged both for special effort in Dublin and to enhance the ITS campus curriculum offerings. Do so understanding that you are adding a line in advance of a retirement where you will regain the line at the retirement, but also realize that this hire will not be inexpensive or at a junior level if the strategy is to work. Invest in a visible and industry recognizable talent and then leverage special security topics for Dublin professional, even as a loss leader to build your overall MITS numbers and to grow the Dublin student base.

Do the same investment in a staff person who can be grown to take on the rank which must be filled when Barbara Moran retires. Typically, Ms. Moran has taken on task after task without help, to keep the program moving. If you wait for her retirement you will suffer function loss because she has accumulated more tasks like alumni and student related support in the admit/enrollment areas which will require more than one new person to sustain this role. Doing a transition hire here allows support for the Dublin development and some “catch up” for critical functions discussed above which there are no resources available to handle now.

It is a smart/strategic interim step that will be offset by a retirement. The crossover time will offset Dublin development impact, allow special efforts on current challenges internally and help transition Barb Moran’s successor. It is low risk, strategic and good academic management for a very stretched (by human resource standards) and productive unit. It also encourages the entire ITS team to move forward at a time when it would be easy to get tired and discouraged about an uncertain future.

In short, OU wins with a low risk, reasonable return, strategic investment which will get made later anyhow, with less potential return. It is a single response to a window of opportunity.

The final issue in this section of reasonable concern is the unit’s sensitivity to expanding diversity in the McClure School. Efforts such as the Women in IT initiative are commendable but if you understand the context at the national level you realize that this field suffers from a shortage of women and minorities, as do many STEM area programs. Continued efforts should be supported and a willingness to realize that diversity must be valued beyond the obvious color or gender markers if we truly believe in real value of diversity. This includes international and it includes a very diverse set of fields from which to draw students to ITS programs.

Investing inordinately to try to fix this area is likely to achieve less than making a continuous effort and seizing special and occasional opportunities to impact it.
Dr. David Ingram  
Chair, Program Review Committee

Dear David,

I have reviewed the draft of the ITS program review dated November 14, 2016, and updated by you on January 7, 2017; I appreciate the correction of the few errors we noted, and the inclusion of Dr. Steele’s separate comments.

I truly appreciate the effort and time the review team put into the site visit and the final report. I also note that we had a number of very insightful and productive conversations during the site visit.

Both the “Concerns” and the “Recommendation” sections address resource and staffing issues created by the combination of our plans to utilize the Ohio Dublin location, as well as the proximity of several faculty and staff to retirement. We agree with the assessment of the reviewers and are currently developing a series of recommendations to the Scripps College leadership. It is our hope to implement proactive solutions which will avoid disruptions of our plans.

We will continue our efforts towards greater diversity in the undergraduate ITS student population, drawing on the expertise of the IT industry which is attempting to address the same problem. We will mindful of Dr. Steele’s advice to recognize especially the lack of gender diversity in ITS as a structural problem pervasive in the industry.

Sincerely

Hans Kruse, Ph.D  
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Adjunct Associate Professor of Electrical Engineering and Computer Science  
Ohio University

cc: Dr. Scott Titsworth, Dean, Scripps College of Communication.