I - Cover Sheet

Name of Program: Information Sciences

Name of Program Chair: Phillip G. Clampitt

Date of Last Program Review: 2012

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II Narrative

Section A - Mission Statement and Program Description
History

Information Science began as a cooperative program among several interdisciplinary units to study information. Originally there was involvement from faculty in communication, management, mathematics, computer science, psychology, geography, linguistics, and logic. When ICS was created as a distinct interdisciplinary unit, it housed faculty from mathematics, communication, computer science, and psychology and these faculty offered disciplinary programs in computer science and in communication. Many of these faculty also collaborated in building several distinct IS courses to go along with the borrowed courses, mainly from computer science and communication.

Mission

The mission statement follows:

- The central organizing concept of the program in Information Sciences (IS) is information related to: its storage, access, and retrieval; its structures in verbal, visual, and quantitative forms; its analysis, interpretation, evaluation, and limitations; its packaging, presentation, distribution, and marketing; the communication of information to others; its inherent link to both technology/machines and people.
- Computing is an important dimension of the program, but students are also required to be well grounded in human language, cognition, information technologies, and communication, insuring against narrow technical preparation which usually leads to rapid obsolescence in rapidly changing fields, while preparing students to make the most creative and useful applications of information and communication technologies.
- The IS program is strongly interdisciplinary and problem focused in helping to meet the needs of the region's many employers who are integral parts of the area's information economy. The curriculum ranges across several disciplines, including computing, linguistics, communication theory, mathematics, data and information technologies, organizational communication, management, marketing, advertising/promotion, and language. The program educates students to identify, conceptualize, define, analyze, and solve information problems. Most courses are project oriented. Internship or practicum experience are encouraged in all the emphases.

The IS program supports the select mission by providing an innovative interdisciplinary, problem-focused educational experience for students. The mission above interlaces these themes around the concept of information with all the implicit challenges of the proper

gathering, storage, analysis and dissemination of information. The College of Arts, Humanities and Social Sciences has a unique mission that parallels the curriculum in IS (See Table below).

Students in the college:	IS Response
Are critical and creative thinkers	Properly storing, analyzing and disseminating information requires critical thinking about challenging information issues
Engage in high impact, hands-on learning experiences	Most of the courses involve real-world information problems
Learn in a diverse and inclusive environment in order to enable success and understand a global, multicultural world	Students are required to work in teams with others who differ in skill sets, orientations, and backgrounds
Develop an understanding of civic and global citizenship and promote this through our community connections	Many class projects focus attention on the management of information for community "clients" and have global implications
Can adapt to change and promote improvement	The program is founded on a continuous improvement mindset and the problems posed to students are constantly changing

Program Description

The interdisciplinary program in Information Science (IS) introduces students to complex information problems topics faced in the knowledge economy. Students will learn essential qualitative and quantitative skills demanded by employers in a digital media environment. Beyond these essential practical skills, students are taught the interpersonal and managerial skills needed to collaborate and coordinate among external stakeholders to achieve a common goal. Internships in Information Science provide qualified students with opportunities for faculty-supervised experience in professional settings outside the classroom. A major in Information Science provides the kind of integrative knowledge that is required for professional careers in a new and emerging media environment.

There are three emphases for the major: Data Science, Game Studies, and Information Technology.

- The **Data Science** emphasis is focused on data tools and analytical methods. Students learn to interpret and communicate their findings through courses from the social sciences,

computer science, statistics and management. In data science students are trained for deep analytical talent positions in areas such as healthcare, logistics, and insurance.

- The **Game Studies** emphasis offers a diverse range of sub-disciplines to develop students into well-rounded game professionals. Students can choose from classes in computer science, communication, psychology, art, business, and music to prepare for careers in game design, programming, journalism, and other related careers.

- The **Information Technology** emphasis offers a solid grounding in computing, mathematics, and communication skills and then builds on that grounding with a broad array of theoretical and applied approaches to information technologies. Also, students are expected to be thoroughly equipped with problem solving, collaborative, and presentational skills to prepare for careers in areas such as systems analysis, human resources, marketing and sales.

Section B - Program Changes Since Last Review

This program originally consisted of courses borrowed from other units, primarily Computer Science and Communication. Over the years, partly in response to recommendations from earlier program reviews to establish its own identity, a number of courses with an IS prefix were created.

Since the last review, four primary changes have occurred:

First, the curriculum has shifted to include three areas of emphasis to mirror current academic and employment trends:

- **Information Technology** – This emphasis offers a solid grounding in computing, mathematics, and communication skills and then builds on that grounding with a broad array of theoretical and applied approaches to information technologies. Also, students are expected to be thoroughly equipped with problem solving, collaborative, and presentational skills to prepare for careers in areas such as, systems analysis, human resources, marketing and sales.

- **Game Studies**- This emphasis offers a diverse range of sub-disciplines to develop students into well-rounded game professionals. Students can choose from classes in computer science, communication, psychology, art, business, and music to prepare for careers in game design, programming, journalism, and other related careers.

- **Data Science** - This emphasis focuses on data tools and analytical methods. Students learn to interpret and communicate their findings through courses from the social sciences, computer science, statistics and management. In data science students are trained for deep analytical talent positions in areas such as healthcare, logistics, and insurance industries.

Second, course staffing has significantly shifted over time. Over the years, faculty who built many of the courses have retired or been reallocated (Girard, Larmouth, Matter, Abbott, Baulieu, Meyer). Faculty who had had an occasional presence in the program (Clampitt) have

been pulled away by more pressing needs in other programs. One source of relief for the staffing cutbacks was the hiring of new faculty in both the Communication and Computer Science programs that could contribute to the Information Science program (Fernandez, Carr, Geisler, Anan, Coman, Turkiewicz, and Chattopadhyay).

This strategic decision was working well until more recent events significantly changed the staffing landscape: a) Professor Fernandez moved onto another job at her alma mater and was not replaced, and b) a decision by the administration to move the Computer Science faculty to another college in the Summer of 2018. Bottom line: the uncertainty surrounding a replacement for Professor Fernandez and the organizational change associated with Computer Science places the entire program in a very tough spot.

Third, retirements resulted in a program with only one tenured faculty member in the entire program (Clampitt) who acted as department chair for Information Science, Computer Science, Communication, and the budgetary unit. This was not ideal. Fortunately, many untenured members of the units took on additional duties. And, two members of the unit should be tenured in the coming academic year. This also meant that merit and retention reviews were conducted with a committee that consisted of only one member who had real-time direct knowledge of the students and program.

Fourth, the program created an application process for students seeking admission to the program. The process was designed to highlight faculty expectations, start building student commitment to a continuous improvement mindset, and screen out students not well suited to the program's approach to learning.

Reactions in previous program reviews have been consistent on the program's strengths (a unique and valuable interdisciplinary niche, strong internship relations with area companies, an emphasis on group work and case studies), but not always on the program's weaknesses. In 2000, the AAC was concerned about the small size of the program but argued that program changes such as eliminating the major or becoming a track within Communication would offer no resource advantages. In 2008, the AAC was concerned about "low visibility" of the program and argued for increased distinctiveness from CS and COMM with more resources or conversion to a minor in COMM. The Dean argued that the program was sustainable but would need resources to grow. In the spring of 2012 on the occasion of Tim Meyer's retirement, ICS took stock of all of its program resources and needs and argued for several new positions across its three programs (CS, IS, and COMM). The response from the administration was to allocate two positions to COMM. Those decisions, coupled with some innovative administrative moves, allowed us to offer the Game Studies and Data Science areas of emphasis. Although they have not proven as attractive as we originally hoped, we believe that in the future they will become as robust as the Information Technology track (see graph).

ICS Majors & Emphases Data

Major	Count
InfoTech	35
Game	5
Data Science	5
IS Major	48
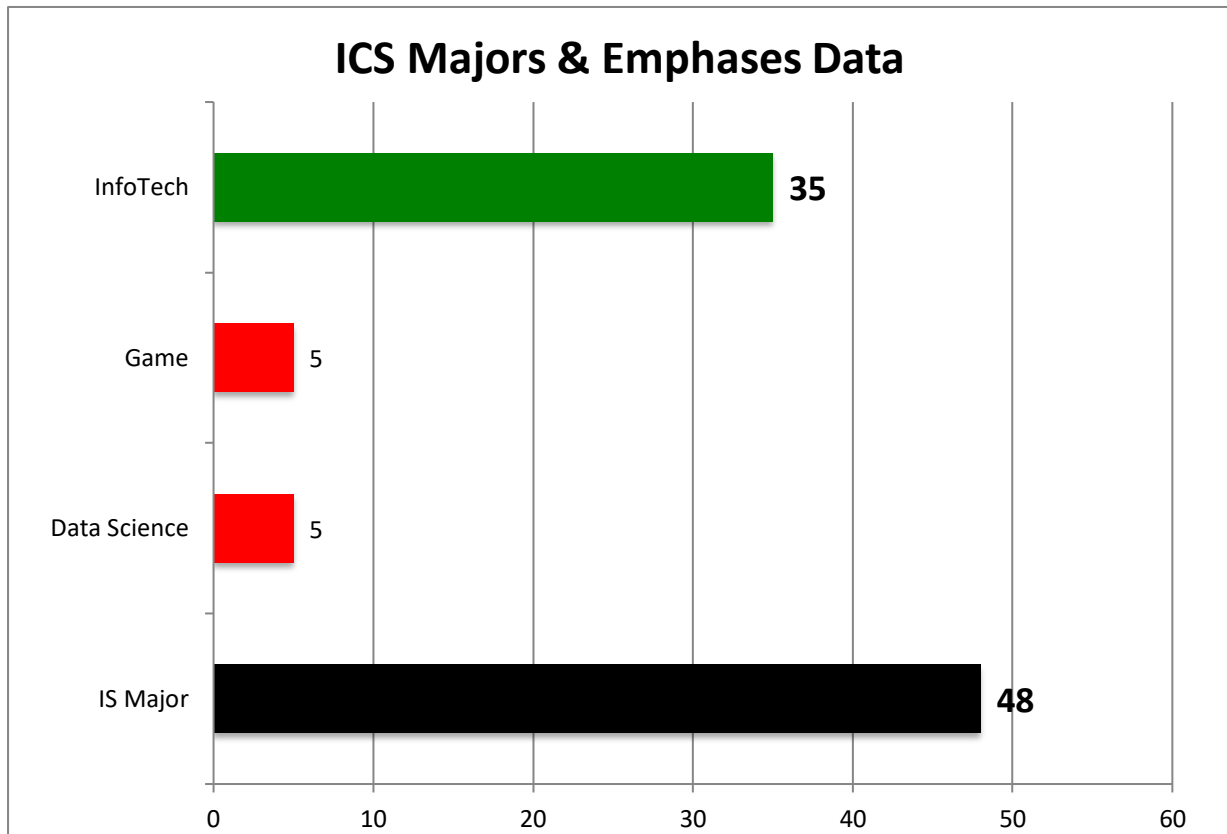
Section C - Student Outcome Assessment

- *Learning Outcome #1* Graduates will be qualified for entry-level information-related positions in either the private or public sector or for graduate-level training in information sciences or related fields (e.g., communication, management of information systems).
- *Learning Outcome #2* Students will show commitment to breadth and innovation as problem-solving strategies and incorporate the ethical dimension that is an inherent part of using technology and/or information; of particular note is the emphasis on audience analysis strategies and in the ethical dimension on issues relating to gender and ethnicity.
- *Learning Outcome #3* Students will show a command of various information skills: computer; visual; information search; interpersonal and written; packaging and presentation; evaluation for relevance, currency, accuracy, validity, source credibility, and limitations; and problem solving.
- *Learning Outcome #4* Students will show knowledge of fundamental concepts in the following fields: communication; discrete mathematics; language structure; information processing; information/data storage, access, and retrieval; computer software design;

management and organizational communication; information technologies; the information society, including issues of audience diversity; and information regulation and control.

Assessment in 2007 consisted of seven measures and was called "well developed" by AAC and the Dean:

- exit interviews
- job placement
- alumni satisfaction
- portfolio review
- group work embedded in three courses
- capstone course survey
- internship and practicum satisfaction

In an effort to economize during recent years, we've evaluated one learning objective per year that matched up with efforts in the related programs (Communication and Computer Science). This has resulted in mostly positive results and some incremental changes in core courses. For example, we've provided more extensive training in how to manage group conflicts through establishing group rules at the beginning of all projects.

The results of the institutional surveys of graduating seniors and alumni are based on small numbers for IS so one should be cautious about interpretations. In general, the responses were positive but there were some concerns about Computer Science courses. Those were largely a result of staffing levels.

The best way to show that students are meeting Learning Outcome #1 (that students are qualified for entry-level positions) is to recognize that they are, in fact, getting jobs, and in many instances, very well-paying jobs.

Regarding Learning Outcome #2 (problem solving and ethics) the results of the assessment survey administered in the capstone course indicated that students had a very high level of satisfaction with their knowledge in these areas.

For Learning Outcome #3 (information skills) the alumni survey and the capstone survey showed that students were satisfied in this area.

Regarding Learning Outcome #4 (knowledge of fundamental concepts in several fields) no single assessment tool is providing us with useful information beyond the aspirations of the required courses to cover the concepts. We need to look at this in more depth.

At this point, the evidence we have on the assessment of student learning does not identify major problems or compromises of program quality. Therefore, suggestions for change are

more likely to come from our struggles with resource issues than from the experiences in student learning.

Section D - Program Accomplishments and Student Success

The program has survived in spite of limitations. In fact, we've had considerable success with a number of our students getting very respectable, high-profile positions. In fact, a number of our graduates work for UWGB. We've managed to re-shape the curriculum in a positive, future-oriented direction. It's a major accomplishment that we've managed to operate a viable program with only one tenured faculty member and a Computer Science program on life-support.

Section E - Program Enrollment Trends and Analysis

Enrollments are growing, roughly doubling in over ten years from 22 to 48, with about 12 graduates per year. Most students don't declare until late in their programs. Transfers are increasing. As the number of Computer Science majors increases, we suspect that many students will shift to Information Science as a backup plan.

The department has analyzed the enrollment trends and developed an approach to evaluate flows into the program. As far as our market, we roughly divide it into two categories: 1) those students who are on a **directed path**, and 2) those who are on a **discovered path**. Those on a **directed path** pursue a major/emphasis right out of high school. Those on a **discovered path** are students who discover the major/emphasis after being on campus. They do so by talking to other UWGB students or "fall into" in the major because of dissatisfaction with their current major/emphasis. The charts below indicate our current analysis of the situation, coupled with tools designed to address enrollment challenges.

	Directed Path	Discovered Path	Number of Majors
Information Sciences			**48**
• Game Studies	5%	95%	5
• Information Technology	5%	95%	35
• Data Science	5%	95%	5
Old Program →→→			(3)

	Tools to Attract Students in the Directed Path	Tools to Attract Students in the Discovered Path
Information Sciences • Game Studies • Information Technology • Data Science	○ Jingle Brawl ○ Global Game Jam	○ Advising dissatisfied CS Majors ○ Jingle Brawl ○ Outreach to 2-year campus professors ○ Global Game Jam

Section F - Conclusions and Vision for Future Development

The future is largely uncertain for two reasons: First, the move of an understaffed Computer Science faculty to a new college presents a major challenge. How long the Computer Science faculty will stay committed to an essentially hybrid program remains unclear. This is particularly true as they will be under great pressure to grow the number of majors. And they will have to do so with few resources and below-market salaries. Second, the continued support of the program from decision-makers remains ambiguous. What will happen to these hybrid programs if the university continues to make cutbacks?

Given the fundamental uncertainties, there are three possible futures: demise, muddle-through, or growth.

Demise

The program could be eliminated, backed by a decision to focus energies on the Communication and Computer Science programs. However, eliminating the program would save few resources since many of the courses are required for other programs. Eliminating the program would only reduce the options that students have for completing their degrees.

Muddle-Through

The program could continue to muddle-through as administrators wait for conditions to change in a more favorable direction. In this scenario, ad hoc faculty and faculty overloads would be needed to fill the gaps.

Growth

Decision-makers could target the program for growth and make some modest investments in one or two new faculty positions. Such a move would seize on current employment trends in the area of Data Science and Gaming. It would lead to a more robust and viable program that should attract many students while providing a viable alternative to some Computer Science students.

III Required Attachments

1. Tables supplied by Office of Institutional Research and Assessment

2. Current Catalog description

http://catalog.uwgb.edu/undergraduate/programs/information-sciences/#text

3. AAC and Dean's conclusions and recommendations from last program review

See assembled documents below

To: Sue Hammersmith, Provost and Vice Chancellor for Academic Affairs
From: Scott Furlong, Dean of Liberal Arts and Sciences
Date: April 17, 2008
Re: Report on the Information Sciences Program Review

I have examined the Self-Study Report prepared by the faculty in Information Sciences, as well as the Program Review conducted by the Academic Affairs Council. Based on my examination of these materials I recommend continuation of the Information Sciences program. Specific comments that I made to the faculty include the following:

1. Information Sciences serves a unique interdisciplinary niche at the University as well as beyond and addresses the information issues in a broad way. The interdisciplinary nature of the program provides a unique education to our students that can be valuable to potential employers.

2. Infom1ation Sciences internship program, as well as its focus on group work and case studies is extremely valuable for their students. Its assessment plan is extensive and relates to student learning and feedback to the curriculum.

3. The size of the program now is sustainable given existing resources. There have not been active attempts to significantly increase the size of the major, but this could happen with additional resources.

4. With a number of recent efforts by the campus to incorporate information literacy into the curriculum, and the potential that this be a skill we want all of our student to possess, it would make sense to have more involvement by the faculty of Information Sciences on this issue campus-wide and potentially in general education.

To: William Shay
Chair, Information and Computing Science
From: Scott Furlong
Dean of Liberal Arts and Sciences

Date: April 17, 2008

Re: Report on the Information Sciences Program Review

The Information Sciences program at the University of Wisconsin-Green Bay is an interdisciplinary program that is oriented toward information problem solving and data analysis, and is quite unique in its attention to these issues. The program draws upon faculty primarily from Communications and Computer Science. The faculty has been diligent in using assessment results to monitor student learning and utilizes group work and case studies to assess student knowledge. It has a successful internship program and serves a potentially important area dealing with information problems in a growing field.   •

Enrollment Trends/Resource Issues:
Majors take courses from Communications, Computer Science, and Information Sciences. The number of Information Science majors over the past five years has been 28.6 with 33 minors, with some declines over the past couple of years. As noted by the unit, they have not actively marketed the program because of resource issues related to the other programs. ICS would not want to see the major grow too significantly given existing resources, and believes it can maintain the current number of students indefinitely without additional resources. ICS has requested growth agenda positions specifically to deal with resource issues that would allow it to grow the major.

Assessment:
The Information Sciences program has a well-developed assessment program that uses a variety of data points to glean information from stakeholders. The data sources include: exit interviews with students, monitoring job placement, an alumni survey, group work and case study evaluation, capstone course evaluation, and internship evaluation. This information is reviewed and fed back into the curricular planning process for the program. Decisions regarding curriculum appear to stem from these assessment results. For example, the capstone course was added to provide opportunities for students to integrate prior learning to information problems. Students were also provided the option of taking a statistics course rather than Discrete Mathematics II, which is probably a more useful course for the Information Science majors.
The AAC noted that some Information Sciences students feel isolated and uncomfortable in the Communication classes. This is likely due to the nature and dynamic of these courses and according to the Chair of ICS does not occur, all of the time. If it is an issue, it seems that some mentoring or advising in the lower level information sciences courses on what to expect in the communications courses would be useful.

Curriculum Development/General Education:
Information Sciences has made appropriate adjustment to their curriculum in response to changing issues and concerns. They have paid particular attention to courses that stress the interdisciplinary theme of the major. Resource issues likely prevent them from spending as much time on the curriculum or adding additional as they may want. The use of tean1 and group projects as well as a strong internship program serves students extremely well in this field and are to be commended.

Like the Communication program, the issue of the missing connection between Information Sciences and general education is problematic. The University has made some initial efforts in the area of information

literacy, and it seems that the faculty in Information Sciences would be ideal in helping the institution improve in this area. The faculty are willing to do so, but as noted have resource issues that may prevent this.

In summary, the program in Information Sciences serves a unique niche at the University that potentially can grow and also be more actively involved in campus-wide learning outcomes. In my opinion the focus on information problems is important and provides a wide range of opportunities both inside and outside the classroom. Because of research issues with the Communication and Computer Science program, Information Sciences may sometimes get "lost" in the shuffle, but there are possibilities for remedies.

Cc: Mark Everingham, Academic Affairs Council
   Tim Sewall, Associate Provost

March 26, 2008
To: Sue Hammersmith, Provost and Vice Chancellor for Academic Affairs
From: Mark Everingham, Academic Affairs Council chair
Re: Information Sciences Program Review Self-Study Report

<u>Introduction</u>

   The Information Sciences program is part of an interdisciplinary combination with Communication and Computer Science. Information Sciences fill a niche in the curriculum oriented toward information problem solving and data analysis. The program is a unique mixture of faculty members and courses not commonly found at other universities.

<u>Student Learning</u>

   Learning outcomes are tightly linked to student success in job placement and career paths. The program relies on exit interviews and monitoring job placement after graduation to assess student perceptions of the value of the program in terms of job skills and career opportunities. There is a strong correlation between student career success and perceptions of the importance of the program's educational experience. The program utilizes group work and case studies in courses such as COMP SCI 451 Database, COMP SCI 331 Internet Programming, and COMP SCI 460 Systems Analysis to assess student knowledge of data access and searching techniques, software design, computer skills, and visual presentation skills. The capstone course on advanced information problems entails the presentation of group projects. The internships assess student ability to function independently outside of the classroom in both private and public sector workplaces.

<u>Program Accomplishments</u>

   The program serves student demand for knowledge and career training related to growing fields in information-based companies and organizations. The program is a small, but important part of broader course offerings in Communication and Computer Science. The internship program shows recent healthy expansion and good connections with areas companies and organizations.

<u>Areas in Need of Attention</u>

1. The program has low visibility on the campus and is often difficult to distinguish from Communication and Computer Science.
2. There is little collaboration among Information Sciences, Communication, and Computer Science faculty members.
3. Faculty hires rarely establish interdisciplinary connections among Information Sciences, Communication and Computer Science.
4. Majors in Information Sciences must take courses in Communication in which they feel isolated and uncomfortable.

<u>Recommendations</u>

   The size of and faculty commitment to Information Sciences raise some concern about its sustainability as a major over the long term. Information Sciences could be converted to a minor under an umbrella of Communication with little impact on access and functiona

4. Program's Assessment Plan Student learning outcomes:

- *Learning Outcome #1* Graduates will be qualified for entry-level information-related positions in either the private or public sector or for graduate-level training in information sciences or related fields (e.g., communication, management of information systems).
- *Learning Outcome #2* Students will show commitment to breadth and innovation as problem-solving strategies and incorporate the ethical dimension that is an inherent part of using technology and/or information; of particular note is the emphasis on audience analysis strategies and in the ethical dimension on issues relating to gender and ethnicity.
- *Learning Outcome #3* Students will show at least an adequate command of various information skills: computer; visual; information search; interpersonal and written; packaging and presentation; evaluation for relevance, currency, accuracy, validity, source credibility, and limitations; and problem solving.
- *Learning Outcome #4* Students will show knowledge of fundamental concepts in the following fields: communication; discrete mathematics; language structure; information processing; information/data storage, access, and retrieval; computer software design; management and organizational communication; information technologies; the information society, including issues of audience diversity; and information regulation and control.

Methods used to evaluate achievement of outcomes:

- job placement
- exit interviews
- internship feedback
- capstone course questionnaire
- graduating senior questionnaire
- alumni questionnaire

Description of which methods are used to assess each outcome:

- #1 assessed through job placements and alumni questionnaire
- #2 assessed through capstone questionnaire and internship feedback
- #3 assessed through exit interviews, internship feedback, capstone course questionnaire, and graduating senior questionnaire
- #4 assessed through exit interviews

Timeline for implementation of methods:

- We assess one learning outcome per year.
- We develop an annual update and discuss results with all faculty.

Those responsible for coordinating data collection:

- chair responsible for exit interviews
- instructors of capstone course responsible for capstone course questionnaire
- internship supervisors responsible for internship feedback
- OIRA responsible for graduating senior and alumni surveys