UNCW Graduate Program Review

Self Study Report for

MS Computer Science and Information Systems
Summary

The MS CSIS Program admitted its first students in the Fall of 2005. The Program consists of 18 credit hours of Core Classes, half delivered from CSC faculty, half from MIS faculty. The remainder of the program consists of 12 hours of electives, and a 6 credit hour Capstone Experience (Project or Thesis). The curriculum is essentially unchanged since its inception.

Quantitative measures of the program represent success:

- Enrollment projections have been met
- Placement is near 100%
- Research output attributable to the Program is high

Stakeholder feedback (from alumni, employers, current students) confirms that the Interdisciplinary nature of the program is unique and valuable. In addition, the respective departments and the university benefit from the Program through improved faculty professional development and highly skilled graduate assistants. The Wilmington IT community benefits, with every major organization employing alumni from the Program.

The Program is not without its challenges. Budget cuts have hurt availability and support for technology. Electives are sometimes cancelled due to limited enrollment. The program can be resource-intensive due to Capstone Experiences and once-a-year graduate course preparations.

Multiple incremental improvements of the program were identified through stakeholder input and data gathering, including:

- Improving reporting capabilities
- Improving recruiting
- Including more teamwork and case method in the curriculum
- Improving elective offerings

In addition to the incremental improvements, several more significant changes might be considered:

- Increasing the number of students in the program
- Re-structuring the Capstone Experience
- Focusing the Program on a more narrow audience

Considering the success of the program thus far, any major change should be approached with great care.
1 History
The Request for Authorization to Establish a New Degree Program was submitted in October of 2004, after several years of planning. The degree officially accepted students in the Fall of 2005. The CSC department had been offering graduate level courses for several semesters, so some early students entered the program with coursework towards the degree program.

The program was initially staffed with 10 tenure-track CSC graduate faculty, and 4 tenure-track MIS graduate faculty. The program is now staffed with 11 tenure-track CSC graduate faculty, and 6 tenure-track MIS graduate faculty. However, several faculty members are in administrative positions that limit their involvement in the Program.

Fourteen(14) students were accepted in the first academic year. Admissions generally increased for the first five years, with a high of 22 admissions in the 2009-2010 academic year. Admissions have somewhat fallen, with 16 admissions in the 2011-2012 academic year. To date, 45 students have graduated from the Program (note that 2011-2012 contains expected graduations).

![Number of Students Accepted by Academic Year](image)
![Number of Graduates by Academic Year](image)

The Program began with Dr. Gene Tagliarani (CSC) as the director. In the Fall of 2006, Dr. Ron Vetter (CSC) assumed the directorship. In the Fall of 2011, Dr. Douglas Kline (MIS) assumed the directorship.

Several minor curriculum changes occurred since program inception, the main one concerning Capstone Projects. The hour requirement was standardized in the catalog so that both Project and Thesis options required 6 credit hours devoted to the Project/Thesis. This catalog change matched practice and made the requirements clearer.

2 Previous Program Reviews
The MS CSIS program has not undergone a formal program review since its inception. For the purposes of this program review, the “Request for Authorization to Establish a New Degree Program” document (See Appendix 1, referred to as the Planning Document henceforth) will be used to benchmark the current program. This will provide an “as-planned” versus “as-is” comparison.
From the Planning Document, the program was expected to begin with 20 Full Time and 5 Part Time students, and have, by Year 4, 40 Full Time students, and 15 Part Time students. Steady-state was expected to be 40 Full-Time, and 15 Part-Time students. The Program currently has 51 students pursuing the degree, but it is difficult to classify them clearly as full-time or part-time (many began as full-time, are now part-time, but may become full-time again). The graph below shows the planned credit hours versus the actual credit hours. In short, the Program met its enrollment projections, but has since fallen off from the projected enrollment. This appears to be partly due to the national graduate enrollment trends, and the cancellation of multiple electives in the past year due to resource constraints.

### 3 Program Characteristics

#### 3.1 Educational Objectives

The CSC and ISOM departments collaborated to establish the following learning objectives for the Program (see Appendix 13.11 Learning Goals for more details):

1. Discipline Specific Knowledge, Skills, Behavior and Values
2. Critical Thinking
3. Communication

These learning objectives are measured with the following instruments:

- Content Knowledge Assessments for each of the Core Classes
  - 10 questions from each Core class
  - Administered at completion of degree (previously at end of course)
- Oral Communication Assessments
  - In two courses: Systems Analysis and Software Engineering
  - Oral communication rubric completed by instructor for oral presentations
- Capstone Project/Thesis Evaluations
Completed by each committee member at final defense

Appendix B is the 2010-2011 Annual Assessment Report for the MS of CSIS. The report gives:

- Content Knowledge Assessments by Learning Objective (questions and results pg 11)
- Oral Communication Assessment Results (pg 25, Rubric in Appendix W)
- Capstone Evaluations Results (pg 24, rubric in Appendix X)

### 3.2 Program Objectives

Program Objectives were established by collaboration among the faculty of the CSC and IS areas. The Program Objectives are also aligned with the UNCW Strategic Goals. The Program Objectives are kept in mind as event, curriculum, and administrative decisions are made.

The Program Objectives are:

- Increase dialogue between industry and the MS CSIS Program
- Provide learning opportunities for faculty
- Improve student recruitment

Appendix B summarizes the Program Objectives, manner of implementation, summary of findings, and actions taken.

### 3.3 Curriculum

The Program consists of 36 graduate credit hours, in 3-credit hour courses.

<table>
<thead>
<tr>
<th>Component</th>
<th>Credit hours</th>
</tr>
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<tbody>
<tr>
<td>Core Courses</td>
<td>18</td>
</tr>
<tr>
<td>Capstone</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>

The Core is required of all students, and consists of the six 3-credit courses. Each Core class has a specific content pre-requisite that is typically satisfied by some undergraduate MIS or CSC course. The Core and prerequisites consist of:

- CSC 532 Design and Analysis of Algorithms
  - Undergraduate Data Structures
- MIS 534 Information Security Management
  - Undergraduate Networking/Telecommunications
- CSC 544 Network Programming
  - Undergraduate Networking/Telecommunications
- CSC 550 Software Engineering
  - Undergraduate systems analysis OR software engineering
- MIS 555 Database Management Systems
  - Undergraduate database
- MIS 565 Analysis, Modeling, and Design
○ Undergraduate systems analysis OR software engineering

The Capstone component can be satisfied with either a Project or Thesis. The Capstone is performed under the guidance of a committee of faculty, chaired by a graduate faculty member. The Capstone is typically accomplished over two semesters, and represents a significant contribution to the body of knowledge in IS/CSC Academia (Thesis) or IS/CSC Profession (Project). The Capstone requires a public proposal and a public final defense. The Capstone also requires a significant document in addition to deliverables agreed upon by the committee.

The twelve required elective hours can be made up of:

- CSC/MIS 591 Directed Independent Study
- CSC/MIS 592 Topics in Computing
- CSC/MIS 598 Internship
- CSC/MIS 5XX various offerings
- Other graduate courses aligned with career goals and approved by academic advisor

In addition to specific course prerequisites, there are also significant Program prerequisites. These not only give context to the application of core coursework, but also contain the concepts and language used in the core coursework. The program pre-requisites are:

- Introductory Computer Programming
- Intermediate Computer Programming
- Introductory Marketing
- Introductory Management
- Introductory Accounting
- Introductory Finance

3.4 Discussion

The main strength of the MS CSIS program is its interdisciplinary nature. This was a major motivation in its creation, and is supported by the current feedback from the stakeholders (Appendix M, Current Students, Alumni, IT Advisory Board, Employers). The Interdisciplinary nature of the program is represented by the Venn diagram below.
The three areas have these characteristics:

- Computer Science – technical theory, science, research, academic contributions
- Information Systems – technical application, implementation, professional contributions
- Business – business theory and application

The Venn diagram represents that none of the characteristics are exclusive of any one discipline. Faculty, courses, capstone projects, and students fall in various parts of the Venn diagram. We view this interdisciplinary nature as a strength of the program.

The Program is considered a Professional Science Masters (PSM) degree and is a member of the UNC Professional Science Master’s degrees (http://www.ncsu.edu/grad/psm/). These programs are typically terminal degrees geared towards professional employment, combining Business and Professional curriculum with Science, Technology, Engineering, and Match (STEM) curriculum.

The Program is delivered in a manner to serve both part-time local working professionals and full-time students. Courses are offered in the evenings or late afternoons. Where appropriate, courses are offered one evening a week.

The Program directly strengthens the Computer Science, Information Systems, and Business degrees at UNC Wilmington:

- CSIS Graduate Assistant activities
  - assist in CSC undergraduate courses (some serve general campus degrees)
  - assist in CSC department technical support
o assist in MIS undergraduate courses (some serve campus and business degrees)
o assist in MIS department, Cameron School of Business technical support
o assist in CSC faculty research (sometimes with other disciplines, e.g. Geography, Psychology)
o assist in MIS faculty research (sometimes with other disciplines, e.g. Finance, Marketing)
o assist in CSC and MIS grants
o co-author research with CSC faculty
o co-author research with MIS faculty
• CSIS faculty (CSC and IS) are developed professionally by
  o teaching graduate level courses
  o mentoring graduate students
  o participating in capstone projects
  o developing electives for graduate courses

Less overtly apparent are these benefits to the campus and community:

• CSIS students are employed by other academic departments and non-academic offices on campus
  o Information Technology Services
  o Admissions
  o Housing and Residential Life
  o Continuing Education
  o Graduate School
• CSIS students are employed as interns, part-time employees, and full-time employees by local businesses
  o GE-Hitachi
  o Visionair
  o PPDI
  o Many others
• CSIS students support grants in other disciplines
  o Chemistry
  o Biology
  o Psychology
• CSIS Capstones projects have become production systems used by campus agencies
• CSIS students and faculty co-author research with faculty from other disciplines on campus
  o Marketing
  o Psychology
  o Finance
  o Operations Management
  o Mathematics
Graduates of the Program are well-received by employers. Forty five (45) students have graduated since inception, with 98% employment within the IT profession. (During the economic downturn, employment was not necessarily immediate upon graduation.) In fact, many students accept employment offers before graduating. The average starting salary for graduates since 2005 is approximately $60,000. The average starting salary for graduates from Fall 2009 to the present is approximately $63,000. Employers include, but are not limited to:

**Local**
- Pharmaceutical Product Development, Inc. (PPDI)
- GE-Hitachi
- Corning
- TranS1
- UNC Wilmington
- New Hanover Regional Medical Center
- Visionair
- ATMC
- Construction Imaging
- Specialty Soft
- Guilford Mills
- Engineering Software Solutions

**Non-local**
- American Eagle (Chicago)
- Deloitte and Touche (Charlotte)
- Price Waterhouse Coopers (Washington, D.C.)
- AT & T (Raleigh, Atlanta)
- DAK Americas (Raleigh)
- SciQuest (Raleigh)
- Credit Suisse (Raleigh)
- CTG (Raleigh)
- LabAnswer (Jacksonville)
- Lideli (Okinawa, Japan)

### 4 Certification, Interdisciplinary Aspects and Synergistic Programs

The Program falls under UNC Wilmington’s accreditation by the Southern Association of Colleges and Schools (SACS, [http://uncw.edu/planning/sacs.html](http://uncw.edu/planning/sacs.html)). Furthermore, the Program falls under the Cameron School of Business accreditation by the Association to Advance Collegiate Schools of Business (AACSB). The Program is also a Professional Science Master’s degree, and participates in the University of North Carolina System-wide Professional Science Master’s Programs.

The Computer Science department’s Bachelor of Science degree is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

### 5 Facilities

The Program is mainly housed within the Computer Information Systems (CIS) building on the UNC Wilmington campus. CSC and IS faculty offices are located on the second floor of the CIS building. The CIS building also features:

- **CIS 2005** – computer classroom with PC computers, projector
- **CIS 2006** – computer classroom with PC computers, projector
- Multiple lecture classrooms with projectors
- **CIS 1003** – financial engineering classroom with dual-screen PC computers
- **CIS 2003** – networking lab
  - 35 laptops
  - Flexible workspace including tables, seating, projection
- CISCO academy equipment for CISCO curriculum
- Electric outlets and network ports every 4 feet around room
- Network patch panel with network isolation

- Three “Sandboxes”
  - Flexible meeting space
  - Large flat-panel screens
  - White boards

- Digital Arts Lab
  - Macintosh computers
  - Large Screens
  - Specialized Input Devices
  - Specialized Software

- CIS 2004 – large open computer lab, with software specific to CSC, IS, CSIS (key-card access)
- CIS 2055 – graduate student lab
  - Cubicles for graduate assistants with power, network, and file drawer
  - Shared printer
- CIS 2035 – large research area
  - 3 distinct rooms
  - Flexible research area for students and faculty
  - Priority given to grant-funded activities
  - Secure server room with several server racks

- Casual seating in many places around building with WI-FI coverage and power outlets

The Program is administered through the Cameron School of Business Graduate Programs office in CIS Suite 1020 (first floor of CIS building). This office administers the MS CSIS program, as well as the Professional Masters in Business Administration, the Masters of Science in Accountancy, and the International Masters in Business Administration program.

The Computer Science department employs a full-time computer support technician, and allocates a graduate assistant to computer support for CSC faculty (14 faculty and staff). The Information Technology Services provides part of a full-time support technician for the entire Cameron School of Business (112 faculty and staff). This technician is limited to generic desktop support. In addition, the Cameron School of Business hires a graduate assistant to assist with the web site and general desktop support.

The Program has special computing needs that are beyond the base needs required by other campus offices and programs. Due to recent budget challenges, the equipment and support for these specialized needs has fallen significantly. Much of the hardware is in need of replacement. Support staff to specify, plan, coordinate with central ITS, purchase, install, and manage new equipment is unavailable. Equipment purchases, even when funds are available, have become more difficult to accomplish.
6 Personnel

6.1 Computer Science
The CSC department is comprised of the following personnel:

- Tenure Track
  - Sridhar Narayan, Professor, Department Chairperson
  - Gur Adhar, Professor
  - David Berman, Professor
  - Clayton Ferner, Professor
  - Curry Guinn, Assoc Professor
  - Eric Patterson, Assoc Professor
  - Laurie Patterson, Assoc Professor
  - Devon Simmonds, Asst Professor
  - Karl Ricanek, Assoc Professor
  - Gene Tagliarini, Professor
  - Ron Vetter, Professor

- Non-tenure Track
  - Ralph Bradley, Lecturer
  - Marni Ferner, Lecturer
  - Jack Tompkins, Lecturer, Assistant Chairperson

- Staff
  - Emma Kay Thornton (Admin Asst)
  - Eddie Dunn (Tech support)
  - Melinda Miles (Admin Asst – grant support)

6.2 Information Systems
The Information Systems faculty are part of the Information Systems and Operations Management (ISOM) department. The following are personnel from the ISOM department that support the CSIS program:

- Department Chairman
  - Cem Canel (Professor, Operations Management)

- IS Tenure Track
  - Jeffrey Cummings, Asst Professor (beginning Fall 2012)
  - Judith Gebauer, Assoc Professor
  - Tom Janicki, Professor
  - Douglas Kline, Assoc Professor
  - Bryan Reinicke, Asst Professor
  - George Schell, Professor
  - Ulku Yaylacicegi, Assoc Professor

- Non-tenure Track
  - Cheryl Fetterman, Lecturer
Kevin Matthews, Lecturer

Staff

Karen Powell (Admin Asst)

The following Appendices give details about the IS faculty:

- Appendix P – Curriculum Vitae
- Appendix Q – Faculty Awards
- Appendix R – Faculty Publications
- Appendix S – Presentations
- Appendix T – Public Service

7 Student Body

The quantitative metrics for the Program student body are summarized in the table below. Each column represents an average for the academic year beginning Fall term, i.e., column one represents Fall 2005, Spring 2006, and Summer 2006. The final column represents all data from 2005 through Spring 2012. This data includes students accepted; not all accepted students entered the Program. Students that took the GMAT (increasingly few, due to the expense), did not take the GRE, and vice versa. Not all students reported their demographic information; the Age and Percentage in the bottom portion of the table represent confirmed values, i.e., percent international represents those that are confirmed international – there may be more.

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<tbody>
<tr>
<td>GMAT</td>
<td>400</td>
<td>570</td>
<td>513</td>
<td>563</td>
<td>538</td>
<td>570</td>
<td>575</td>
<td>542</td>
</tr>
<tr>
<td>GRE Quant</td>
<td>607</td>
<td>653</td>
<td>586</td>
<td>713</td>
<td>602</td>
<td>620</td>
<td>638</td>
<td>625</td>
</tr>
<tr>
<td>GRE Verbal</td>
<td>488</td>
<td>487</td>
<td>409</td>
<td>460</td>
<td>454</td>
<td>473</td>
<td>451</td>
<td>473</td>
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<tr>
<td>GPA</td>
<td>3.5</td>
<td>3.3</td>
<td>3.3</td>
<td>3.3</td>
<td>3.0</td>
<td>3.2</td>
<td>3.3</td>
<td>3.2</td>
</tr>
<tr>
<td>Age</td>
<td>28</td>
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<td>27</td>
<td>30</td>
<td>29</td>
<td>31</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Pct Male</td>
<td>93%</td>
<td>86%</td>
<td>53%</td>
<td>85%</td>
<td>82%</td>
<td>83%</td>
<td>75%</td>
<td>79%</td>
</tr>
<tr>
<td>Pct UNCW IS</td>
<td>0%</td>
<td>29%</td>
<td>13%</td>
<td>21%</td>
<td>23%</td>
<td>28%</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>Pct UNCW CSC</td>
<td>93%</td>
<td>50%</td>
<td>20%</td>
<td>36%</td>
<td>36%</td>
<td>22%</td>
<td>13%</td>
<td>37%</td>
</tr>
<tr>
<td>Pct Int'l</td>
<td>0%</td>
<td>4%</td>
<td>20%</td>
<td>14%</td>
<td>14%</td>
<td>11%</td>
<td>13%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Several promising trends are apparent:

- More students with non-UNCW degrees are being accepted
- GMAT scores are trending upward
- GRE Verbal scores are trending upward

Ethnicity is summarized in the table below:

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pct White</td>
<td>100%</td>
<td>79%</td>
<td>80%</td>
<td>43%</td>
<td>80%</td>
<td>78%</td>
<td>69%</td>
<td>77%</td>
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</tbody>
</table>
In general, students who desire graduate assistantships have been able to obtain them, either through the CSIS program, or with other academic or administrative departments on campus. The table below summarizes the graduate assistantships and support funds granted, by year. Note that in 2011-2012, 6 additional graduate assistantships were available through grants with the Chemistry and Psychology departments.

<table>
<thead>
<tr>
<th>Pct Black</th>
<th>0%</th>
<th>0%</th>
<th>0%</th>
<th>21%</th>
<th>5%</th>
<th>11%</th>
<th>19%</th>
<th>7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pct Hispanic</td>
<td>0%</td>
<td>14%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Pct Asian</td>
<td>0%</td>
<td>7%</td>
<td>7%</td>
<td>7%</td>
<td>5%</td>
<td>6%</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>Pct Nat Amer</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>14%</td>
<td>5%</td>
<td>6%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Pct Other</td>
<td>0%</td>
<td>0%</td>
<td>7%</td>
<td>0%</td>
<td>5%</td>
<td>0%</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>Pct unknown</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>14%</td>
<td>0%</td>
<td>0%</td>
<td>6%</td>
<td>2%</td>
</tr>
</tbody>
</table>

| AsstShips | 10 | 10 | 10 | 10 | 12 | 12 | 12(+6) | 70 |
| $1000 Scholarships | 7 | 3 | 3 | 2 | 3 | 4 | 22 |
| $500 Scholarships | 8 | 12 | 12 | 10 | 6 | 48 |
| Tuition Rem’n | 1 | 1 | 3 | 2 | 5 | 12 |

In general, students who desire graduate assistantships have been able to obtain them, either through the CSIS program, or with other academic or administrative departments on campus. The table below summarizes the graduate assistantships and support funds granted, by year. Note that in 2011-2012, 6 additional graduate assistantships were available through grants with the Chemistry and Psychology departments.

Students who are admitted attend a one-day Orientation at the beginning of the Fall semester. The Orientation includes program information, research presentations from faculty, a Meyers-Briggs assessment, professional etiquette session, and a team-building low-ropes course. Appendix V shows the CSIS class profile booklet that is created each year. Once each Fall and Spring, a Capstone Orientation is held covering the details of topic selection, committee selection, and administration of capstones. At the end of the Spring semester, a Graduation dinner is held (in addition to the UNCW Commencement) to celebrate graduates along with their families. A variety of other activities are available to them through the departments: IT Career Night, Wilmington IT Exchange and Expo, Business Week, IT Advisory Board Meeting, and ad hoc meetings with IT professionals.

In general, funding is available for students to give research presentations. However, the MS CSIS program does NOT have a budget to fund student travel. The funding is procedurally difficult to obtain, coming from multiple sources, each with their own requirements and procedures. Sources for student funding include:

- $ from the Cameron School of Business
- $ from the ISOM Department
- $ from the CSC Department
- $ from the UNCW Graduate School
- $ from the UNCW Graduate Student Association
- $ from ad hoc grants
8 Affirmative Action
The CSIS program embraces diversity. Faculty and Staff represent a variety of racial backgrounds, religious viewpoints, and genders. Admissions decisions consider diversity, and have resulted in good diversity in the student body. Appendix Y gives the Affirmative Action statement from the UNC Wilmington Graduate Catalog.

9 Research and Scholarship
9.1 CSC Faculty
The Computer Science Faculty Activities are represented in the following appendices:

- Appendix AC – CSC Faculty Vitae
- Appendix AD – CSC Faculty Awards
- Appendix AE – CSC Faculty Publications
- Appendix AF – CSC Faculty Presentations
- Appendix AG – CSC Public Service
- Appendix AH – CSC Funded Projects

In general, the CSC Faculty are active in Teaching, Service, and Research. The bullets below summarize the faculty, research areas, teaching area, and special service activities. Faculty identified with an asterisk (*) have been active in teaching and/or participating in capstones in the CSIS program.

- *Gur Adhar
  - Full Professor, tenured
  - Teaching: Design and Analysis of Algorithms
- *David Berman
  - Full Professor, tenured
  - Research: Combinatorial Designs, Theoretical Computer Science
  - Teaching: Design and Analysis of Algorithms
  - Service: UPE Honor Society
- *Clayton Ferner
  - Full Professor, tenured
  - Research: Parallel and Distributed Computing, Parallel Compilers
  - Teaching: Grid Computing, Parallel Computing
- *Curry Guinn
  - Assoc Professor, tenured
  - Research: Spoken Dialog Systems, Virtual Humans and Collaborative Agents, Natural Language Processing
  - Teaching: Natural Language Programming
- Sridhar Narayan
  - Full Professor, tenured
• Research: Computational Intelligence, Neural Networks, Genetic Algorithms and their applications
  • Service: Computer Science Department Chair

*Eric Patterson
  • Assoc Professor, tenured
  • Research: Audio-Visual Speech Recognition, Digital Arts, Computer Animation
  • Teaching: Pattern Recognition, Computer Animation, Real-time Graphics

*Laurie Patterson
  • Assoc Professor, tenured
  • Research: Women in Computer Science, Computing and Information Technology, Web-Based Learning
  • Service: WITX committee member

*Devon Simmonds
  • Asst Professor, un-tenured
  • Research: Software Engineering, Model-driven development, Component-based Software Engineering, Aspect-Oriented Design
  • Teaching: Software Engineering, Component-based Software Development

*Karl Ricanek
  • Assoc Professor, tenured
  • Research: Biometric Systems, Computer and Machine Vision, Signal Processing, and Digital Intelligence
  • Teaching: Biometrics, Digital Image Processing
  • Service: WITX Committee member, MS CSIS Advisory Committee member

*Gene Tagliarini
  • Full Professor, tenured
  • Research: Biologically-inspired computing including neural networks, fuzzy logic, and evolutionary programming
  • Teaching: Design and Analysis of Algorithms, Artificial Intelligence

*Ron Vetter
  • Full Professor, tenured
  • Research: Computer Networks, Mobile Computing, Parallel and Distributed Systems, Web-based Technologies
  • Teaching: Network Programming
  • Service: WITX Committee member, MS CSIS Advisory Committee member

9.2 IS Faculty
The IS Faculty Activities are represented in the following appendices:

• Appendix P – IS Faculty Vitae
• Appendix Q – IS Faculty Awards
In general, the IS Faculty are active in Teaching, Service, and Research. The bullets below summarize the faculty, research areas, teaching area, and special service activities. Faculty identified with an asterisk (*) have been active in teaching and/or participating in capstones in the CSIS program.

- **Jeffrey Cummings**
  - New Asst Prof beginning Fall 2012, untenured
  - Teaching: IT Project Management, Telecommunications

- ***Judith Gebauer, Assoc Professor**
  - Assoc Professor, tenured
  - Research: Task Technology Fit, IT Flexibility
  - Teaching: E-Commerce, IT Strategy
  - Service: Annual Site Visit to EMC, AT&T, IBM, CISCO

- ***Tom Janicki, Professor**
  - Full Professor, tenured
  - Research: IS Pedagogy
  - Teaching: Web Programming, IT Project Management
  - Service: Endowed Professor, Internships, Event Organization, IT Adv Board

- **Douglas Kline, Assoc Professor**
  - Assoc Professor, tenured
  - Research: Neural Network Methodology, User Perceptions of Security
  - Teaching: Database, Windows Administration
  - Service: Director of CSIS

- **Bryan Reinicke, Asst Professor**
  - Asst Professor, untenured
  - Research: Technology Integration, IT Mergers
  - Teaching: Systems Analysis

- **George Schell, Professor**
  - Full Professor, tenured
  - Research: IT Management, Strategy
  - Teaching: Programming, Database
  - Service: Assoc Dean of Business School

- **Ulku Yaylacicegi, Assoc Professor**
  - Assoc Professor, tenured
  - Research: Healthcare IT, Technology Diffusion
  - Teaching: Telecommunications
  - Service: CISCO liaison, Cyber Defense Competition, MS Academic Alliance

### 9.3 Student Output
Appendix Z lists the research that is attributable to the Program. This research mainly comes from capstone projects and theses, but also comes from classroom assignments, or independent studies. The research outlet for most is refereed conference proceedings, but also includes refereed journal articles in journals such as Computer, Journal of Information Systems Applied Research, and Journal of Information Systems Education.

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10 Goals and Objectives: Strengths and Weaknesses

As part of the program review, the following activities were planned and executed:

- IS/MSCSIS Advisory Board Meeting Breakout (Feb 1, 2012, Appendix M)
- Program Review Kickoff Meeting (Feb 3, 2012, Appendix L)
- Current Student Focus Group (Feb 16, 2012, Appendix U)
- ISOM Faculty Meeting Feedback (Feb 24, 2012, Appendix AB)
- CSC Faculty Feedback (March 5, 2012, Appendix AA)

In particular, the IS/MSCSIS Advisory Board Meeting and the Current Student Focus Group offered well-reasoned, thoughtful, constructive feedback.

The bullet items below summarize the feedback from all these stakeholders.

Strengths

- Interdisciplinary nature of program
- Applied nature of program
- Smaller size of program
- Student Aid (assistantships)
- Placement of graduates / Job opportunities
- Ability to personalize program/flexibility
- Quality of faculty
- Professional networking opportunities
- Friendly and helpful staff
- Wilmington location – tourist destination

Weaknesses
• Lack of Global IT component
• Too few electives
• Faculty resources (too few faculty)
• Lack of an “integrative” class
• Cross-listing of courses; very similar graduate/undergraduate courses
• High Variability in entering student skill sets (technical, business, and applied)
• Lack of discretionay program budget
• Large number of pre-requisites
• Large class sizes (in some cases) / variability of class size

Opportunities

• Foreign student recruitment
• Recruitment outside UNC Wilmington
• Upcoming undergraduate IT major
• Economic recovery
• UNCW’s goal of developing graduate programs
• Graduate Business Certificate – (easier to achieve business pre-requisites)

Threats

• Faculty Workload
• Conditional Admits
• Exhaustion of local market
• Lack of involvement from some faculty
• Divide between CSC and IS faculty / departments
• Hardware and technical support
• Changing technologies

Suggestions

• Benchmark more closely with other Prof Science Masters degrees
• Make capstone projects optional (due to too few faculty)
• Include Professional mentoring as part of program
• More teamwork
• More case study methodology
• More Microsoft / .Net – less Java
• Student-to-student mentoring

Many of the positive AND negative items above come from the fact that the Program is very broad and serves multiple purposes:

• Full-time students & Part-time students
• Phd-bound students & profession-bound students
• Multiple technology foci: telecommunications, software development, project management, etc.
• Multiple student backgrounds & skillsets: MIS / CSC
• Content from multiple disciplines: MIS/CSC/Business
• Theory & Application

10.1 Operational Challenges and Incremental Improvements

10.1.1 Central Database for MS CSIS program
The MS CSIS program poses operational challenges that other programs may not have. First, the program is not lock-step in nature. Students enter in the Fall or the Spring, and proceed at their own pace. Second, the program is relatively large. In short, it is difficult to generate accurate reports, and make operational decisions.

A central database for the program would be extremely helpful for operational decision making. The database could cover the following aspects of the program:

- Capstones
- Recruitment
- Degree requirement progress
- Alumni tracking
- Assessment

10.1.2 Review Core Courses
The MS CSIS program accepts students from a variety of disciplines, schools, and professional backgrounds. The Core courses are required by all students in the program. Based on alumni and current student feedback, there is a wide variance in the view of the core courses. On one hand, a student with a UNC Wilmington MIS degree might find the MIS555 Relational database course to be “too much review”. On the other hand, the course can be extremely challenging, with essentially no review material for students with a different background.

The wide variance in backgrounds is handled differently, depending on the faculty member. Some faculty might adjust and teach to the lowest skill level in the class. Other faculty might teach to the highest level and students must “sink or swim”. In either case, some set of students is under-served.

Additionally, students, alumni and advisory board members all mentioned Teamwork and Case Methodology as desirable aspects for our courses. In summary, the core courses should be reviewed for content and approach, and in consideration of the following items:

- Teamwork
- Case Methodology
- Remediation versus Advanced Content
10.1.3 Review Elective Offerings
The elective offerings have been sparse and inconsistent. This is partly due to budget constraints, faculty scheduling constraints, and difficulty in assessing elective needs. For convenience and resource efficiency, many of the electives have been cross-listed with undergraduate courses, or courses designed for other programs have been accepted as electives in the CSIS program. Students have had little input into the choice of elective offerings. It has been very difficult for students to plan their path to program completion. In summary, the elective offerings should be reviewed with these items in mind:

- Fewer cross-listings
- Regular rotation of electives
- Selection of electives (which electives should be offered?)

10.1.4 Improve Marketing and Recruitment
In general, having a larger applicant pool would improve many of the metrics on which the program is evaluated. Growing the applicant pool while keeping the number of admissions the same would lower our acceptance rate, and increase our average incoming metrics such as average standardized test scores and average grade point average.

The Program marketing to date has been limited, mainly due to budget and human resource constraints. However, there are likely creative marketing options that could improve our applicant pool. A concerted effort in this regard would likely prove fruitful.

10.1.5 Continue to cultivate internship and placement opportunities
The MS CSIS program enjoys excellent relationships with employers. These relationships benefit us in many ways:

- Employment and internship opportunities for students and alumni
- Professional development for faculty
- Access to advanced technologies
- Influence on curriculum

The Program should continue to cultivate these relationships, and leverage them to improve the program.

10.1.6 Resources
The MS CSIS Program has suffered from budget cuts. The quantity and quality of available hardware is affecting instruction. Furthermore, the technical support staffing is very limited. Because of the technical nature of the Program, there is a need for consistent technical support for the specialized technologies necessary for the Program.

Some of the resource limitations are being addressed through creative uses of technology such as virtualization. Also, faculty and graduate assistants are being used to effectively back-fill technical support gaps.
However, the slow technology-refresh cycle, and lack of sustained technical support is a serious threat to the Program.

10.2 Strategic Challenges and Program Re-engineering

10.2.1 Increase the number of admissions to the Program
Several recurring themes have appeared in the feedback from stakeholders, and review of the data to date:

- Too few elective offerings
- Cross-listing of electives (to have sufficient enrollment)
- Cancellation of electives due to low enrollment
- High variation in class sizes (as low as 5, as high as 26)
- One graduate preparation per year (difficult for faculty)
- Class scheduling is difficult, since courses are offered only once per year

It is possible that increasing the number of students admitted to the program might solve some of these problems. In short, a larger program might allow:

- Core course to be offered Fall and Spring (fewer 1-time preparations for faculty)
- More consistent class sizes
- Fewer elective courses cancelled due to low enrollment
- Fewer cross-listed electives
- Easier scheduling for students

The specifics of what a larger program might look like are not in the scope of this document. A task force would need to review the possibilities and bring a proposal to the departments.

Based on the universities’ goal to increase graduate enrollment, it may be an opportune time to consider enlarging the program.

10.2.2 Re-structure Capstone Projects/Theses
The capstone experience in the MS CSIS program produces significant benefits to students, and the other stakeholders. However, it is also a very resource-intensive part of the curriculum. It might be possible to retain the benefits of the Capstone while using resources in a more efficient manner. Some possibilities that have been suggested, or exist in other programs:

- Smaller committees
- Allow group/team capstones
- Increase the credit hours of capstones to better align with the resource requirements
- Allow a coursework option (no capstone)
- Move some of the Capstone experience to a class setting, e.g., have a “Writing your proposal” class
Because the Capstone is a central part of the Program, caution should be used in restructuring the Capstone. However, it may be that Capstones could be more efficiently provided.

10.2.3 Choose a Program Focus
As mentioned earlier, the Program serves many audiences: full-time and part-time; Computer Science and Information Systems backgrounds; PhD-bound students and workforce-bound students; various technologies, etc. This comes with benefits and disadvantages.

In some respects, serving multiple audiences might lessen the quality to a single audience. A focus on a single audience might better serve that audience, but at the sacrifice of other audiences. For example:

- Focus on Full-time or Part-time students
- Focus on PhD-bound or Workforce-bound students
- Focus on one or more specific technologies

However, a change in this regard would like significantly change the nature of the program. Any change of this type should be considered and reviewed carefully.
This memorandum is in response to the external program review report of the MS CSIS program by Professors Alfred Weaver and Upkar Varshney.

In general, the report was very positive, finding no significant deficiencies in the program. However, several opportunities and suggestions were offered with regard to:

1. Recruiting
2. Capstone component
3. Elective offerings
4. Financial Support

Based on the report, for the next five years we will focus on improving the quality of the program, rather than increasing the quantity of students.

Specific actions to be taken:

- Improve the program web site.
  - Release capstone documents as a serial publication with Google Scholar links. Create cover pages for all capstones that link directly to the main program page.
- Incorporate social media.
  - The program has established a Facebook presence, and uses LinkedIn for public announcements of proposals, defenses, and other events. Members of the MS CSIS group in LinkedIn are now national and international. Over time, usage should increase and benefit word-of-mouth advertising.
- Undertake a region-specific Google Adwords marketing campaign
  - Candidate regions might include Washington, D.C., New York City, and large international cities.
- Maintain and cultivate the value from the Professional Science Masters designation.
  - There is anecdotal evidence that this affiliation is significant in attracting applicants. We will continue to participate.
- Consider options for addressing Capstone workload
  - Increase capstone credit hours to align with student and faculty work load
  - Offer Capstone course to “batch” students, and more effectively use faculty resources.
  - Allow Team Capstones
- Continue to seek grants and/or donors, as appropriate.
  - Small Sloan Foundation grant submitted Aug 2012.
- Work with CSC and ISOM chairs to rationalize elective offerings
- Develop funding sources for:
  - Scholarships
  - Student travel for presentations
  - Marketing of the program
We found the program review process to be very helpful. The formal reflection of all stakeholders confirmed that the program is successful and is on the right path. In addition, many truly helpful suggestions were made that will guide us for the next five years.