College of Information Technology
Academic Plan 2004 – 2009
1. Introduction

The College of Information Technology at UNC Charlotte was established on July 1, 2000. It consists of two departments, three centers/institutes, and numerous laboratories (Figure 1).

Figure 1. College of Information Technology

The two departments have established extensive relationships with industry and other units within the University.

In addition to the two departments, the College of Information Technology has instituted the Board of Advisors. The Board consists of the representatives of the community, including business, government, and educational institutions. This broad composition of the Board will ensure that all COIT programs and services reflect the priorities of its target client base.

2. Process

Due to the fact that the Department of Software and Information Systems (S&IS) is a new department (started on July 1, 2001), there is no existing plan or process in place for that department. Hence, this year will be the first time S&IS has submitted a complete academic plan. The Department of Computer Science has participated in the 2000-2007 academic plan of the College of Information Technology. Consequently, its new plan represents an upgrade of the previous plan.
This draft of the strategic plan for the College of Information Technology was derived through numerous meetings of the faculty, staff, and leadership of the College of Information Technology, including its Dean, the Chair of the Computer Science Department, the Chair of the Software and Information Systems Department, the Associate Chair of the Computer Science Department, the Executive in Residence, and the Chairs of various College and departmental committees.

3. Assumptions
Several assumptions regarding the College of Information Technology motivate innovative programs and on and off-campus relationships:

- The student enrollment in IT is expected to grow, albeit at a slower pace in the next 2-3 years than it has in the past 4-5 years.
- The minority students will continue to be under-represented in both the student and the faculty body of the College.
- IT is still in a very formative stage of development and intellectual boundaries are quickly changing.
- IT knowledge is very quick to develop, change, and become obsolete.
- Resources for IT curriculum and research are broadly applicable to most every college in the University.
- IT continues to be one of the differentiating factors for competitive organizations of today and tomorrow.

Based on these assumptions, the College of IT intends to pursue a very dynamic and interdisciplinary approach to student and faculty recruitment, curriculum development, research programs, and community services.

Note: This strategic plan assumes that the new Science and Technology building will be built in the timeframe addressed by this plan, and that the College of Information Technology will occupy a major portion of that building. Therefore, this plan does not address the issue of space, which is clearly inadequate (currently) for the teaching and research responsibilities of the College.

4. Mission
The mission of the College of Information Technology should

- Emphasize WHY we do what we do, NOT WHAT we do
- Define our culture
- Guide our activities
- Be simple and straightforward

The following mission statement satisfies the above requirements:

*The mission of the College of Information Technology is to add value to the university, community, and society through creative and innovative educational programs, research, development, and application of information technology.*

This mission statement emphasizes the following main points:

- By concentrating on the issues of interest to the immediate and global community, this will help the College prioritize its resources, define research directions, direct hiring efforts, and encourage faculty development
- Teaching, basic and applied research, and service are equally valued
- Creativity and innovation are prerequisites for establishing and maintaining a leadership role in a discipline as dynamic as information technology

There is no need to modify the mission statement at this time.
5. Goals

The following goals have been established for the College of Information Technology:

I. Develop and maintain an adaptive learning environment that enables its students to graduate with the skills needed by the market at the time of their graduation
II. Establish a research culture that supports basic, applied, and interdisciplinary research
III. Serve the information technology needs of the community on and off campus through programmatic development, industry partnerships, and innovative application of information technology

These goals address the campus wide themes of (a) applied science and technology, (b) business and finance, and (c) urban and regional development.

5.1 Develop and maintain an adaptive learning environment that enables our students to graduate with the skills needed by the market at the time of their graduation

Objectives

- Develop, implement, and maintain state-of-the-art computing infrastructure, computing facilities, and software platforms
- Develop, implement, and continuously update flexible curricula that are aligned with the information technology needs of the community
- Improve the freshman experience
- Improve freshmen retention
- Improve the advising process
- Improve students’ interdisciplinary experience
- Increase the diversity of the student/faculty body
- Improve the faculty experience
- Improve faculty efficiencies in teaching
- Provide students with hands-on, real-life based project experience
- Develop and implement content delivery modalities (classroom, TV, Web, etc.) that are appropriate for the course material and convenient for the student
- Offer programs through satellite locations
- Increase the number and quality of graduate and undergraduate majors
- Support continuing education of the faculty
- Continuously improve employer satisfaction with graduates’ performance on the job, as indicated by employer response to “better prepared” question on SPART employer survey
- Increase student/faculty exposure to international/global experience

Proposed Actions

- Reduce reliance on part-time faculty and improve the quality and consistency of our introductory computer science major and service courses, advising, and retention of undergraduate students by creating a “freshmen teaching faculty” of twelve full-time non-tenure track Lecturer and Senior Lecturer positions
- Review our undergraduate baccalaureate and graduate programs to provide for new opportunities for students to select emphasis, tracks, and/or specialized programs appropriate to today’s information technology environment (Certificates in: Software Design and Engineering, Information Environments, Network and System Security, Communication Networks; Masters Programs in: Bioinformatics, Communication Networks, and Knowledge Discovery in Databases; Bachelor of Arts in Software and Information Systems; New Department in Bioinformatics/Biomedical Systems; Vendor Certifications)
- Establish an Honor’s Program in Computer Science to attract and challenge outstanding high school graduates
- Establish a chapter of the Computer Science Honor Society on campus
- Participate fully in the University’s Freshmen Learning Community
• Restructure the introductory course sequence
• Substantially restructure the S&IS BA program to reflect more accurately the intellectual domain of the Department
• Increase Ph.D. only course offerings to (on average) six sections per year
• Provide out of state tuition waiver for all full-time Ph.D. students supported by graduate assistantships
• Develop an undergraduate course on IT Applications that would contribute to the University’s General Education Program
• Establish cooperative programs with local and regional technology oriented magnet schools and community colleges
• Rename the S&IS undergraduate program to a name that provides proper and recognizable branding to the program
• Develop new S&IS course(s) at freshman/sophomore level that reflect(s) the intellectual domain of the Department
• Explore the possibility and potentially develop new S&IS degree programs (or new tracks within existing programs) at both undergraduate and graduate levels in areas such as information security and privacy, software engineering, information environments, trusted system design, and network and system security
• Start an Undergraduate Research Opportunities in Computing (UROC) Program to encourage and support the participation of undergraduates in IT research
• Establish centers/institutes that will support research and curricular activities of students and faculty (Bioinformatics, Security and Privacy, KDD/Data Mining/Business Intelligence, Biomedical Engineering – with COAS and COE, Institute for Quality and Technology in Education – with COEd, Data Visualization Research – with COA)
• Develop strategies and programs to recruit and retain women and minority students into our undergraduate and graduate programs at a rate that exceeds the national average for Ph.D.-granting computer science departments --> establish the Diversity in IT Institute (DITI)
• Continue the S&IS’ partnerships with Historically Black Colleges and Universities such North Carolina A&T State University
• Continuously evaluate our curriculum to ensure that it reflects industry practice and needs, while also balancing market demand for specific content in our programs with wisely chosen fundamental material
• Maximize the student experience with the eBusiness Technology Institute and the Center of Excellence in Information Assurance. Extend that experience to other vertical industries
• Continuously improve employer satisfaction with graduates’ performance on the job, as indicated by employer responses to appropriate surveys
• Reduce class sizes and increase the number of small group projects
• Strengthen the advisor-advisee relationship
• Distribute marketing sheets on our programs to high school counselors and potential students
• Develop a summer program in computer science for gifted high school students
• Present International Program to Freshman ITCS 1214 and ITCS 1215 classes
• Enhance international study and travel opportunities for the undergraduate students
• Review and revise our M.S. program to strengthen its relationship to both our undergraduate and Ph.D. programs
• Develop the process and secure the funds for continuing development of a state-of-the-art computing infrastructure
• Implement an all-laptop, wireless environment
• Design and equip classrooms with multimedia facilities and Internet access
• Establish new departments (e.g., Bioinformatics, Communication Networks) reflecting new intellectual domains
• Secure funding and recruit new faculty (in adequate numbers)
• Increase the number of teaching assistants supporting the instructors
• Encourage students to minor in other disciplines by concentrating on the use of information
technology in those disciplines
• Increase the financial compensation of the faculty
• Define the process and the teams for innovative content-delivery methods
• Secure funds and select programs for the continuing education of the faculty
• Involve industry representatives in curriculum evaluation
• Offer for-credit certification programs
• Secure the funds for the team that will develop student communication applications
• Establish and adequately staff a College Student Services office in order to provide needed services
for the students
• Automate all administrative aspects of the student-institution communication, e.g., discussion groups,
class assignments, intermediate grade reporting, etc.
• Offer programs in Ballantyne and uptown locations
• Promote relationships with K-12, Universities, industry, and government labs

**Evaluation**

• Develop an exit interview with all graduating students to evaluate (a) the number and quality of
employment offers they received before the day of graduation and (b) their evaluation of the quality of
education they received at COIT  *(Responsible: Olin Broadway, Timeframe: 3/1/2003)*

**Use of Evaluation Results**

• Review and update the above action items bi-annually, based on the results of the evaluation criteria

5.2 Establish a research culture that supports basic, applied, and interdisciplinary research

**Objectives**

• Increase the number of large grants and the average per tenure track faculty member external
funding to at least $100,000 by academic year 2003-2004 and to $150,000 by academic year 2006-
2007
• Establish 4-5 major research thrusts (centers of excellence) in the College. The current ones include
(1) knowledge technologies; (2) information integration, security, and environments; and (3)
multimedia computing and communications.
• Produce a significant quantity of high quality, visible research publications on a continuing basis
• Increase participation in interdisciplinary research (e.g., computer engineering, precision
manufacturing, optoelectronics, education, communications/networking, e-business, biology,
geoigraphy, education, environment, health, architecture, arts)
• Continue to improve the quality of our graduate students and increase the number of full-time Ph.D.
students to a ratio of 4 per tenure track faculty
• Provide financial support for all Ph.D. students in the College

**Proposed Actions**

• Establish an endowed chair position for at least three of the thrust areas
• Focus resources on the activities surrounding the thrust areas. Establish centers/institutes that will
support research activities of students and faculty (Bioinformatics, Security and Privacy, KDD/Data
Mining, Biomedical Engineering – with COAS and COE, Institute for Quality and Technology in
Education, Data Visualization Research – with COA).
• Establish a new department in the area of Bioinformatics/Biomedical Systems.
• Increase our tenure track faculty to at least 50 positions to help us achieve and maintain an effective
and equitable student-faculty ratio to support both a balanced portfolio of courses and develop 4-5
core research areas in which we can excel
• Reduce the average tenure track faculty teaching load to three courses per year
• Increase our name recognition and visibility at Southeastern US Colleges and Universities through
development of a graduate program recruiting poster, faculty visits to those schools to give talks and
meet with potential graduate students, and professional and personal contacts with faculty advisors at
those schools
• Identify and encourage our best undergraduates to continue on to graduate study in the College
• Create strategies for recruiting outstanding students from related disciplines into our Ph.D. program in
Information Technology
• Develop joint relationships and programs with strong universities in other countries to help attract the
best international students into our program
• Provide financial support and tuition remission to every full-time Ph.D. student in good standing and
the best M.S. students at a level that is competitive with other Ph.D.-granting Colleges
• Institute an annual review of all Ph.D. students by the entire faculty to ensure that they are fully
engaged as part of our academic community and making appropriate progress in completing their
degree
• Hire pre-award, post-award, and proposal-writing staff who will support principal investigators
• Support the junior faculty in their efforts to secure external funding (mentoring, course reduction,
summer support, conference attendance, visits to funding agencies, visits to their collaborators in
industry and at other universities, etc.)
• Adequately reward the faculty who continuously secure external funding for their research and
professional activities (consider both monetary and non-monetary methods)
• Secure the funding for state-of-the-art computing infrastructure, laboratories, and facilities to be used
by research faculty and students
• Secure the funding for the support staff
• Increase the number of support staff; both technical and non-technical
• Promote relationships with K-12, Universities, industry, and government labs

Evaluation
• Develop a set of criteria for measuring the research output of the College, e.g., annual research
expenditures, number of papers in top-level journals, number of students participating in research
activities (Responsible: Hodges, and Chu, Timeframe: 3/1/2003)

Use of Evaluation Results
• Review and update the above action items annually, based on the results of the evaluation criteria

5.3 Serve the information technology needs of the community

Objectives
• Establish COIT as the premier source of information technology expertise, services, and facilities in
the region
• Establish an income stream (from offered services) of $1,000,000 per year by year 2004, increasing
by 10% per year thereafter

Proposed Actions
• Establish centers/institutes that will support applied research needs of the community (Bioinformatics,
Security and Privacy)
• Improve faculty competency through available sources, such as industry exchanges and short
courses
• Implement a colloquium series with graduate students and industry participation (partially supported
by industry)
• Build new relationships with local industry, leading to consortia, internships, scholarships, and senior
projects
• Develop strategies and programs to recruit and retain women and minority students into our undergraduate and graduate programs at a rate that exceeds the national average for Ph.D.-granting computer science departments
• Establish an alliance program offering services to the community, including programmatic development, consulting, access to research results, innovative application of information technology, test labs, executive continuing education classes, forums, panels, and seminars
• Create centers of excellence in information technology areas of interest to the community (Bioinformatics, Security and Privacy, KDD/Data Mining, Biomedical Engineering – with COE and COAS, IQTE – with COEd, Data Visualization Research – with COA)
• Maintain the Board of Advisors of leading information technology practitioners from the major sectors of the community
• Establish a continuing education program, in partnership with external partners (brokering), which will offer a spectrum of information technology offerings to the community, thus solidifying the role of the College of Information Technology as the dominant provider of IT in the region
• Promote relationships with K-12, Universities, industry, and government labs

Evaluation
• Develop an annual survey, distributed to the community through the Information Technologies Council of the Charlotte Chamber of Commerce, collecting data on community’s perception of the role of COIT as the information technology leader and strategic resource (Responsible: Olin Broadway, Timeframe: 3/1/2003)

Use of Evaluation Results
• Review and update the above action items annually, based on the results of the evaluation criteria

6. Student Learning Outcomes

Computer Science Department

Assessing student learning outcomes for SACS accreditation has been administered throughout the Computer Science programs. The assessment process will be continuously reviewed and updated. The criteria used in the Computer Science Department include:

a) Ability to apply knowledge of mathematics, science, and information technology

<table>
<thead>
<tr>
<th>Measure:</th>
<th>Grades on Senior Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment:</td>
<td>Senior year</td>
</tr>
<tr>
<td>Frequency:</td>
<td>Once per semester</td>
</tr>
<tr>
<td>Student Sample Size:</td>
<td>40-80 students</td>
</tr>
<tr>
<td>Expected Performance Level:</td>
<td>90% of students receive A or B on their senior project reports</td>
</tr>
</tbody>
</table>

b) Ability to design and conduct experiments, as well as analyze and interpret data

<table>
<thead>
<tr>
<th>Measure:</th>
<th>Grades on related CSCI 2214 project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment:</td>
<td>Mid-semester</td>
</tr>
<tr>
<td>Frequency:</td>
<td>Once per semester</td>
</tr>
<tr>
<td>Student Sample Size:</td>
<td>Entire class (50 students/section)</td>
</tr>
<tr>
<td>Expected Performance Level:</td>
<td>85% of students receive an acceptable grade (C or better) on their project reports</td>
</tr>
</tbody>
</table>

c) Ability to design a system, component, or process to meet desired needs.
**d) Ability to function on multidisciplinary teams**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Grades on CSCI 1215 final team project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment</td>
<td>End of semester</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once per semester</td>
</tr>
<tr>
<td>Student Sample Size</td>
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<tr>
<td>Expected Performance Level</td>
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</table>

**e) Ability to identify, formulate, and solve information technology problems**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Grades on written portion of CSCI 3155 team projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment</td>
<td>End of semester</td>
</tr>
<tr>
<td>Frequency</td>
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</tr>
<tr>
<td>Student Sample Size</td>
<td>Entire class (50 students)</td>
</tr>
<tr>
<td>Expected Performance Level</td>
<td>85% of students receive an acceptable grade (C or better) on their presentations and reports</td>
</tr>
</tbody>
</table>

**f) Understanding of professional and ethical responsibility**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Grades on CSCI 3688 presentation and report #1 on ethics and professional responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment</td>
<td>During the semester</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once per semester</td>
</tr>
<tr>
<td>StudentSample Size</td>
<td>Entire class (25 students/section)</td>
</tr>
<tr>
<td>Expected Performance Level</td>
<td>85% of students receive an acceptable grade (C or better) on their presentations and reports</td>
</tr>
</tbody>
</table>

**g) Ability to communicate effectively**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Grades on CSCI 3688 oral presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment</td>
<td>During the semester</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once per semester</td>
</tr>
<tr>
<td>Student Sample Size</td>
<td>Entire class (25 students/section)</td>
</tr>
<tr>
<td>Expected Performance Level</td>
<td>85% of students receive an acceptable grade (C or better) on their presentations</td>
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</table>

**h) Understand the impact of information technology solutions in a global and societal context**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Grades on CSCI 3688 oral presentation and its report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(s) of Assessment</td>
<td>During the semester</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once per semester</td>
</tr>
<tr>
<td>Student Sample Size</td>
<td>Entire class (25 students/section)</td>
</tr>
</tbody>
</table>
Expected Performance Level: 85% of students receive an acceptable grade (C or better) on their presentations and reports

i) A recognition of the need for and an ability to engage in life-long learning

**Measure:** Grades on CSCI 3688 report on Hopper video  
**Time(s) of Assessment:** During the semester  
**Frequency:** Once per semester  
**Student Sample Size:** Entire class (25 students/section)  
**Expected Performance Level:** 85% of students receive an acceptable grade (C or better) on their reports

j) Knowledge of contemporary issues

**Measure:** Grades on CSCI 3688 final report  
**Time(s) of Assessment:** During the semester  
**Frequency:** Once per semester  
**Student Sample Size:** Entire class (25 students/section)  
**Expected Performance Level:** 85% of students receive an acceptable grade (C or better) on their final reports

k) Ability to use the techniques, skills, and modern information technology tools necessary for information technology practice

**Measure:** Grades on Senior Projects  
**Time(s) of Assessment:** Senior year  
**Frequency:** Once per semester  
**Student Sample Size:** 40-80 students  
**Expected Performance Level:** 90% of students receive A or B on their senior project reports

Software and Information Systems Department

For each criterion on student learning, a course is selected by the Department to perform outcome assessment. A “Course Assessment and Improvement Synopsis” form is filled and reported by instructors of the selected courses at the end of each semester. The result of each individual measure comparing with the expected student performance for the criterion is listed below.

a) Ability to apply knowledge of information technology to practical problems

**Measure:** Grades on Senior Projects  
**Expected Performance Level:** 90% of students receive A or B on their senior project reports

b) Ability to design and conduct experiments, as well as analyze and interpret data

**Measure:** Grades on related ITCS 1215 project  
**Expected Performance Level:** 85% of students receive an acceptable grade (C or better) on their project reports

c) Ability to design a system, component, or process to meet desired needs
Measure: Grades on written portion of ITIS 3155
team projects

Expected Performance Level: 85% of students receive an acceptable grade (C or better) on their project reports

d) Ability to function on multidisciplinary teams

Measure: Grades on ITIS 3155 team projects

Expected Performance Level: 85% of students receive an acceptable grade (C or better) on their project reports

e) Ability to identify, formulate, and solve information technology problems

Measure: Grades on written portion of ITIS 3155 team projects

Expected Performance Level: 85% of students receive an acceptable grade (C or better) on their presentation and reports

f) Understanding of professional and ethical responsibility

Measure: Grades in ITCS 3688 for the first peer review paper on ethics and professional responsibility

Expected Performance Level: 90% of students receive an A grade on their reports

g) Ability to communicate effectively

Measure: Grades on ITCS 3688 oral presentation

Expected Performance Level: 90% of students receive a grade of A or B on their presentations

h) Understand the impact of information technology solutions in a global and societal context

Measure: Grades on ITCS 3688 oral presentation

Expected Performance Level: 90% of students receive a grade of A or B on their presentations

i) A recognition of the need for and an ability to engage in life-long learning

Measure: Grades on final ITCS 3688 report

Expected Performance Level: 90% of students receive a grade of A on their reports

j) Knowledge of contemporary issues

Measure: Overall ITCS 3688 final grade

Expected Performance Level: 90% of students receive a grade of A or B on their final reports

k) Ability to use the techniques, skills, and modern tools necessary for IT practice

Measure: Grades on Senior Projects

Expected Performance Level: 90% of students receive A or B on their senior project reports
7. Planning Elements

A. Trend of Increased Enrollments

The College has initiated the planning process for improving the recruitment among the high school graduates in the region. Special attention will be paid to the recruitment of minorities and women. Also, we expect that the number of graduate applicants will decline in the near future due to the political and economic situation in the world. We are working on establishing better contacts with major universities throughout the world to secure the continued pool of graduate applicants.

Enrollments in MSIT and the two graduate certificate programs offered by the S&IS department have been increasing at robust rates. Based on inquiries of potential students interested in graduate programs offered by the Department, the pipeline of new students appears to be very healthy. The current BA program, on the other hand, appears to have limited growth potential for the following reasons:

- The S&IS BA program lacks name recognition that students and their potential employers can easily identify
- The curriculum is not sufficiently different from that of comparable Computer Science programs

B. Distance Education

Distance education programs in the College of IT will be carefully evaluated and implemented. The College has already successfully tested a distance learning offering at the international level, working with our colleagues in Poland. Since this decision is based on the available resources, it is not something that the College will get into without careful consideration and planning.

The S&IS department will continue to offer targeted distance learning programs through its collaborations with NC A&T State University under the Carolinas Cyber Defender Scholarship program. This model can be expanded to include more targeted groups if appropriate circumstances arise.

C. Internationalization

The College already has a very substantial population of international students and faculty. The challenge will be to devise study abroad/exchange programs that will motivate American students to go overseas to fulfill part of their degree requirements. We will work closely with the International Office to plan and implement such initiatives.

D. Outreach and Engagement

The College is currently in the planning stage for implementing a Management of IT graduate certificate program at the new Ballantyne location. The College is also making preparations for offering vendor certifications on campus through broker-based arrangements.

E. General Education

The application of information technology is pervasive in our society. The current general education program does not contain a course that educates our students about basic concepts of information technology. The College plans to offer such a course that could be part of the general education curriculum.

F. Research and Creativity Activity

The College has secured over $3M dollars this year in Federal and private funding. Given its size, the College is making a major contribution toward obtaining the Doctoral/Research Extensive status for the
University. Currently, three major research areas have been identified, with additional two expected to be identified within a couple of years.

Adequate support in faculty lines, lecture positions, staff positions, and the development of policies with appropriate incentives are critical success factors to place the College among one of the leading research Colleges in the nation.

G. Information Technology

First, let us examine the assumptions that will characterize COIT over the next five to seven years:

1. **COIT graduates will be exposed to multiple operating systems and hardware.**

   Not only is the Wintel platform (Windows 95/98/NT/2000/xxx O.S. on Intel/AMD/xxx hardware) essential due to its widespread deployment in industry, so is Unix (Linux/Solaris/Irix/AIX/xxx). Arguments can be made for further expanding the exposure to include Be (for embedded systems and Network Appliances), and other niche operating systems. Technology support needs within the COIT will reflect the increased university/community role the new college is expected to play. These needs will be significantly greater on an ongoing basis than they have historically been.

2. **COIT computing needs will be diverse and will include both more specialized operating systems and more sophisticated cross-platform/operating-systems communications.**

   Since its inception, Project Mosaic has provided much of the computing technology support for the CSCI department. However, for several years now the CSCI department has supported two operating systems, (Irix and Linux), in addition to the two supported by Project Mosaic (Solaris and Windows NT). Additionally, the CSCI department has supported Oracle for academic database use, and PVM for parallel computing. None of these have had any significant use by the COE’s other academic units; they support almost exclusively unique needs of the CSCI (and now the COIT).

   Also, COIT students should be allowed to gain administrative control over their computers. While many students own computers, the current infrastructure does not let students’ personal computers effectively share important parts of the unique resources (e.g. expensive software) that are typically available only at the university. In addition, the current computing paradigm does not have an adequate model for supporting emerging computing paradigms (e.g. the new department is developing a curriculum on information environment which may involve smart phones, personal digital assistants, wearable computers, and biometric-based authentication).

3. **COIT graduates will have exposure to current technological solutions of the computer industry generally and the Charlotte IT community in particular, with a heavy emphasis on web-enabled applications.**

   Network-level data communications and database driven web-based applications are obviously highly visible aspects of the COIT from an industry perspective. However, the COIT has significant research and teaching efforts in a wide range of additional fields including graphics and visualization, robotics, genetic algorithms, artificial intelligence, manufacturing systems integration, and various facets of computer engineering. COIT technology support needs can be expected to grow significantly as the new college expands its commitments.

4. **COIT faculty will be collaborating closely with faculty of other disciplines, sharing files and applications as part of their collaborative research and teaching efforts.**

   A robust cross-platform mechanism for sharing files in a secure and backed-up manner will facilitate this goal.
5. **COIT students at some level (perhaps all students in COIT courses, perhaps all majors and minors, perhaps only advanced undergraduates and graduate students, perhaps only the graduate students) will be expected to provide at least a part of their own computing capability via laptop computers.**

The COIT will employ the computing technology solutions most appropriate to its role in the education of its students, but in so doing, will not disenfranchise or otherwise unduly burden non-COIT majors.

In turn, these assumptions carry with them some implications for services and systems:

1. The first and fourth assumptions above imply that the COIT needs a stable, robust, industry-supported, file system and associated services, including cross-platform file- and application-sharing, backup, printing, and email. A university-wide solution is preferred to “island-type” solutions that prevent interdisciplinary collaboration.

2. The second and third assumptions above imply a mission-based requirement for information technology support that is broader than for any other unit on campus. While much synergy is gained though interim use of the COE’s Project Mosaic infrastructure, the more diverse needs of the COIT will require resources unique to its programs. Prior to the formation of the COIT, Computer Science had requirements for information technology infrastructure that were neither shared, nor supported, by the COE; these support requirements will only increase given the expanded mission.

3. The fifth assumption above argues for a careful analysis of the requirement that all entering COIT students be required to provide/buy/lease their own laptop computing facilities.

I) Description of the “ideal” computing environment within the COIT:

The “ideal” computing environment would include a distributed file system supporting multiple platforms and operating systems, with an authentication system permitting single username / password / login, multiple-platform and operating system file access, uniform email and printing, and seamless operation from home/office/on-the-road. Further, it would permit the user to check out all or part of their campus file system, use it off-line, and resynchronize when next logging into the campus system. It would have excellent security, permit laptops to roam, (potentially around the world), yet provide file access and shared services. This “ideal” would provide infrastructure support for laptops, as well as “next generation” wireless personal devices, assisting the users to fully utilize campus services and facilities. Finally, hardware and software support would reside in the same organization to reduce “finger pointing” when the inevitable problems occur. This “ideal” is a level of computing well above what is presently provided by Computing Services and encompasses aspects not yet supported by the COE’s Project Mosaic. Thus, it represents a significant improvement to the campus educational computing environment and will carry a corresponding price tag. However, we in the COIT feel that this is a direction immensely beneficial to the non-COIT students, essential to the COIT students, and well worth the university’s commitment of resources.

The COIT’s mission includes teaching and research; it does not focus on technology support. Logically, the support for centralized services that are share-able and which gain structural efficiencies and eliminate duplication should be located at a level higher than the COIT. However, we are willing to provide the needed support infrastructure to fulfill our primary missions if that higher level is unwilling or unable to do so. In examining any option for achieving this “ideal” computing infrastructure, it is essential to remember that simply slicing the pie differently DOES NOT create more pie. Only structural efficiencies associated with development efforts that are truly shared, rather than merely duplicated, have the potential to create more “usable” pie by eliminating unnecessary duplication. No matter the approach to supporting COIT computing infrastructure, a significant number of additional IT support positions are necessary if the COIT is to fulfill its mission. The primary decision relates to whether the university will choose to put a relatively small amount of resources into support of only the COIT, or will choose to structure additional resources in a way that offers support to other colleges as well.
II) Recommendation for computing infrastructure support of the COIT:

We believe the optimum solution for meeting the needs of the entire campus is a Campus-wide Enterprise “Ideal” Solution. However, should the funding not immediately be available to pursue a full campus rollout, we recommend

III) Integration of student laptops
The decision of whether or not to require student-supplied laptops is a separate issue from whether or not the technical support staff and equipment will be provided to meet other infrastructure and educational needs, both in the COIT and in other colleges. The integration of laptops into mainstream coursework, whether in the COIT only or across campus, must be built upon the foundation of that basic computing infrastructure. Several universities have a history of supporting student laptop computing, while others are slowly integrating them one year at a time beginning with the incoming freshman students. In all cases these universities have significantly increased the “Help Desk” level user support specifically to address the laptop support issues. These increases appear to be proportional to the number of laptops supported and generally fall in a range of one support person per 100-200 laptops. Chapel Hill, for example, began requiring laptops for all entering freshmen this Fall and added approximately 100 technical user support staff (at the university level) to accommodate the increased user support load.

The Gartner Group is on record as believing that one user support position is required for every 50-75 laptops, while Drexel and the University of Maryland staffing levels fall more in the range of one support person per 150-200 laptops. Chapel Hill falls closer to the Gartner Group’s staffing estimates than to the staffing levels of the other universities. No university has been able to replace all of its discipline-specific computer laboratories with student-supplied laptops. All have continued to support discipline-specific software in central computer laboratories, although the need for many of the general-purpose usage (word processing, spreadsheets, Internet access, etc.) laboratories has been eliminated.

8. Use of Assessment Data
The data collected through the assessment procedures will be evaluated on a semester basis. The conclusions reached (lessons learned) will be used to devise a course of action to remedy the shortcomings. The Chairpersons of the units within the College will be responsible for the process. This subject will be discussed, on a semester basis, at the Information Technology Advisory Council meetings.