



University of  
West Florida

**PROGRAM REVIEW  
EXECUTIVE SUMMARY  
2005 - 2007**

**Department of Computer Science  
College of Arts and Sciences**

**11.0101, Computer Science, B.S.  
Computer Science Specialization  
Computer Information Systems Specialization**

**11.0101, Computer Science, M.S.  
Computer Science Specialization  
Software Engineering Specialization**

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# Computer Science Program Review

## Executive Summary

2006-2007

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**CONFIRMATION OF PROCESSES  
FOR  
ACADEMIC PROGRAM REVIEW**

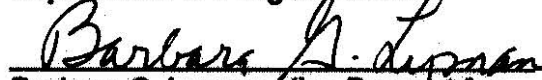
I hereby confirm that the enclosed program review for Computer Science has included all processes outlined in Board of Governors requirements:

- a delineation of the specific academic programs (with levels) that were included in review
- a brief description of the nature of the review and whether it was part of an accreditation review or self-study with external consultant
- directory information on the external consultant
- a synopsis of actions taken as a result of earlier program reviews
- a copy of the Academic Learning Compact for each reviewed baccalaureate degree program
- a summary of program strengths, weaknesses, opportunities, and threats (SWOTs)
- recommendations based on review findings.


These items are included in the Executive Summary. Further, each program review was conducted according to University of West Florida approved university policy.

  
\_\_\_\_\_  
Department or Program Head

5-24-07  
Date

  
\_\_\_\_\_  
Barbara G. Lyman, Vice Provost for  
Programs and Planning

5-30-07  
Date

  
\_\_\_\_\_  
John C. Cavanaugh, UWF President

6/25/07  
Date

The University of West Florida  
Academic Program Reviews

Program Review Report—Executive Summary

THE UNIVERSITY OF WEST FLORIDA

Academic Program Review  
Executive Summary (\*See note below)

Department/Division: Computer Science

Chair: Leonard W. ter Haar

Review Dates: 2005-2006

Programs Reviewed:

CIP Code	Degree Level	Degree Name
<u>110101</u>	<u>BS, Minor</u>	<u>Computer Information Systems</u>
<u>110101</u>	<u>BS, MS, Minor</u>	<u>Computer Science</u>
<u>110101</u>	<u>MS</u>	<u>Software Engineering</u>
<u>110101</u>	<u>Minor</u>	<u>Internet Technology</u>

## **Executive Summary**

**The Computer Science Self-Study and Program Review documentation describes the circumstances the department found itself in as of Fall 2005. In Fall 2005, Dr. Leo ter Haar was asked to serve as Interim Chair of the Department for two years. To date, the Department has been preparing extensively for this innovative review from two perspectives:**

- 1) The collection of the data that tends to summarize the past five years. To sum it up, the enrollment statistics speak volumes for all tracks at both the B.S. and M.S. levels. While there are many sides to the root cause of the dire straits CS finds itself in – some internal and some external – it has been a clear goal of the new leadership that the Department become keenly aware of the situation. To its credit, the Department has moved through the mourning and bereavement phase and on to the very interesting challenge of rebuilding its program and its future.**
- 2) The next five years. While the superstructure of undergoing Program Review has been instrumental in helping the Department to begin to set its course, the framework of the UWF strategic planning process has been problematic from the beginning. This is best understood from the vantage point of requiring too many details that simply cannot be fleshed out properly with out first having promoted sufficient discussion of the mission, values and vision that the department has in its context as the “Computer Science” department of a regional comprehensive university that has set as its goal to be one of the best in the nation.**

**As discussed with the Dean and the Provost, and appropriate to the context that this is a rebuilding process for the department, Computer Science underwent a pilot test of a revised approach towards the Academic Program Review Process. For the pilot:**

- a) An external consultant was brought in to visit at the *front end* of the process and *prior* to the completion of the self-study.**
- b) The agreement with the external consultant allowed for the consultant to review and comment on the self-study once it has been completed, making any additional recommendations for improvement that may be warranted based on self-study data.**
- c) The external consultant was brought to campus in Spring 2006, following approval by the Provost.**
- d) The Department had until September 30, 2006 to submit the Final Program Review Report as one of the programs submitting their review AY06-07.**

**All other components of the self-study remain essentially the same. If through formative assessment it was to be determined that additional substantive changes were needed in the timeline or process for this pilot project, these items were to be discussed, negotiated, and documented following review by the Provost. If successful, the pilot may yield a model that can be offered as an optional approach to the Academic Program Review Process in future years.**

**Directory Information on External Consultants:**

**Kuiyuan Li, Ph.D.  
Professor and Chair  
Department of Mathematics and Statistics  
University of West Florida**

**John W. McCormick, Ph.D.  
Professor  
Computer Science Department  
University of Northern Iowa**

**Karen L. Rasmussen, Ph.D.  
Chair and Associate Professor  
Engineering and Computer Technology  
University of West Florida**

**Brief Description of Program(s):**

**Mission/Purpose**

**The Department of Computer Science is committed to providing students with opportunities to pursue an education within any of several disciplines within the Computational Sciences. Our programs will be distinguished by academic excellence, opportunities for expression of personal creativity, and development of greater civic awareness. Our Faculty will engage students with the concepts, theories, frameworks and methods that will prepare them for successful entry into the field or for further study. Through active learning, students will develop skills in critical thinking, communication, project management, and a foundation in values and ethics that are the ideal preparation for this rapidly changing field.**

**Vision**

**The vision of the Department of Computer Science is not only to be recognized by students and professionals alike as the premier provider of quality computer science education in the region, but also to be viewed as a leading institution in research and service to the community and profession.**

**Values**

- 1. Respect – Treating others with dignity and courtesy, regardless of sex, race, age, handicapping condition or other attributes**
- 2. Caring – Creating a safe and dynamic learning environment that encourages the development of individual potential**
- 3. Integrity – Doing the right thing for the right reason**
- 4. Quality – Dedication to uncompromising excellence**
- 5. Innovation - Dedication to exploring and expanding the boundaries of knowledge**

6. Teamwork - Working together to achieve shared goals
7. Stewardship - Managing and protecting our resources
8. Courage - Being different by design

## Curriculum

### 1.4. Curriculum

The curriculum for the undergraduate Computer science option degree is the more theoretical of the two undergraduate curricula, and is geared toward mathematical and scientific applications of computers. The prerequisites include Calculus I and II, physics, two science courses and basic programming. The core is similar to the CIS option with the exception of Theory of Computation and Analysis of Algorithms. Electives for this curriculum are typically math-oriented. The computer science curriculum is contained in the following table.

<i>B.S., Computer Science; Department of Computer Science</i>				
<b>Catalog Year 2005 – 2006</b>				
<b>Course</b>	<b>Sh</b>	<b>Sub Course</b>	<b>Semester</b>	<b>Grade</b>
<i>CS program prerequisites (25sh)</i>				
<b>Science Course for Science Major</b>	<b>3</b>			
<b>Science Course for Science Major</b>	<b>3</b>			
<b>COP2xxx: Programming course* (Java Preferred)</b>	<b>3</b>			
<b>MAC2311: Calculus I</b>	<b>4</b>			
<b>MAC2312: Calculus II</b>	<b>4</b>			
<b>PHY2048 &amp; PHY2048L: University Physics I w/ Lab</b>	<b>4</b>			
<b>PHY2049 &amp; PHY2049L: University Physics II w/ Lab</b>	<b>4</b>			
CS core curriculum (30sh)				
<i>[Grades in major must be C- or higher w/ major GPA <math>\geq</math> 2.5]</i>				
<b>CDA3100: Microprocessor Systems</b>	<b>3</b>			
<b>CEN4516: Computer Networks</b>	<b>3</b>			
<b>CIS3021: Science of Computing</b>	<b>3</b>			
<b>COP3022: Intermediate Programming</b>	<b>3</b>			
<b>COP3530: Data Structures</b>	<b>3</b>			
<b>COP4020: Programming Languages</b>	<b>3</b>			
<b>COP4600: Operating Systems</b>	<b>3</b>			
<b>COT3100: Apps of Discrete Structures</b>	<b>3</b>			
<b>COT4400: Analysis of Algorithms</b>	<b>3</b>			
<b>COT4420: Theory of Computation</b>	<b>3</b>			

<i>Technical electives (6 sh) choose two of the following:</i>				
<b>CEN3031: Software Engineering</b>	<b>3</b>			
<b>COP4601: Software Systems</b>	<b>3</b>			
<b>COP4710: Database Systems</b>	<b>3</b>			
<i>Major related courses &amp; Approved Electives** (24 sh)</i>				
<b>ENC3240: Technical Writing</b>	<b>3</b>			
<b>MAD3107: Discrete Math &amp; Its Applications</b>	<b>3</b>			
<b>MAS3105: Linear Algebra</b>	<b>3</b>			
<b>STA4321: Intro: Math/Stats I</b>	<b>3</b>			
<b>COP2253: Java or Upper division elective**</b>	<b>3</b>			
<b>Upper division elective**</b>	<b>3</b>			
<b>Upper division elective**</b>	<b>3</b>			
<b>Upper division elective**</b>	<b>3</b>			

The Computer Information Systems curriculum is oriented toward business computing. The prerequisites for the program include accounting, economics, statistics, business calculus, and introductory programming. The core is similar to the core in the CS option. Where the core differs, the CIS requires more applied, business-oriented course such as the System Project and Introduction to Operations Research. CIS option students can complete a minor in Business by carefully selecting electives. The CIS curriculum is contained in the following table.

<i>B.S., Computer Information Systems; Department of Computer Science</i>				
Catalog Year 2005-2006				
Course	Sh	Sub Course	Semester	Grade
<i>CIS program prerequisites (27sh)</i>				
<b>ACG2021: Financial Accounting</b>	3			
<b>ACG2071: Managerial Accounting</b>	3			
<b>CGS2570: Microcomputer Application</b>	3			
<b>COP2334: C++ Programming</b>	3			
<b>COP2253: Java Programming</b>	3			
<b>ECO2013: Principles of Economics –</b>	3			
<b>ECO2023: Principles of Economics – Micro</b>	3			
<b>MAC2233: Calculus w/ Business</b>	3			
<b>STA2023: Elements of Statistics</b>	3			
<i>CIS core curriculum (39sh)</i>				
<i>[Grades in major must be C- or higher w/ major GPA ≥ 2.5]</i>				
<b>CDA3100: Microprocessor Systems</b>	3			
<b>CEN3031: Software Engineering</b>	3			
<b>CEN4400: Intro to Operations Research</b>	3			
<b>CEN4516: Computer Networks</b>	3			
<b>CIS3021: Science of Computing</b>	3			
<b>CIS4327: Systems Project</b>	3			
<b>COP3022: Intermediate Programming</b>	3			
<b>COP3530: Data Structures</b>	3			
<b>COP4020: Programming Languages</b>	3			
<b>COP4600: Operating Systems</b>	3			
<b>COP4601: Software Systems</b>	3			
<b>COP4710: Database Systems</b>	3			
<b>COT3100: Apps of Discrete Structures</b>	3			
<i>Major related courses &amp; Approved Electives* (21 sh)</i>				
<b>ENC3240: Technical Writing</b>	3			
<b>MAD3107: Discrete Math &amp; Its</b>	3			
<b>Upper division elective</b>	3			
<b>Upper division elective</b>	3			
<b>Upper division elective</b>	3			
<b>Upper division elective</b>	3			
<b>Upper division elective</b>	3			

Currently the M.S. in Computer Science and Software Engineering have similar prerequisites and a substantial overlapping required core including courses in architecture, software design, networks, operating systems and programming languages. The Computer Science option has two required specialization courses, Introduction to Artificial Intelligence and Computation and Complexity which conveys computability theory and an introduction to analysis of algorithms. The following chart shows prerequisites and requirements.

M.S. Computer Science, Computer Science Option					
Catalog Year 2005-2006					
Course	Undergraduate	Eval.	Course	Graduate	Eval.
<b>Foundational Proficiencies</b>			<b>Required Core Courses</b>		
CDA 3100	Microprocessor Systems		CDA 6158	Adv. Computer Architecture	
CEN 3031	Intro to Software Engineering		CEN 6064	Software Design	
CEN 4516	Computer Networks		CEN 6520	Adv. Computer Networks	
COP 4020	Programming Languages		COP 6025	Adv. Programming Languages	
COP 4600	Operating Systems		COP 6611	Adv. Computer Operating Systems	
COP 4601	Software Systems				
COT 4400	Analysis of Algorithms		<b>Required Specialization Courses</b>		
COT 4420	Theory of Computation		CAP 5600	Intro to Artificial Intelligence	
			COT 6415	Computation & Complexity	
<b>Additional courses you may be required to take</b>			<b>Other Requirements</b>		
COP 2253	Programming in Java		COT 6931	3 sh CS Project (+ 12 sh of approved electives)	
COP 3022	Intermediate Programming (Java)			(or)	(or)
CIS 3025	Science of Computing		CIS 6971	6 sh Thesis (+ 3 sh of approved electives)	
ENC 3240	Technical Writing			30 sh w/ Thesis - 36 sh w/ Project	
COP 3530	Data Structures and Algorithms		<b>Approved Electives</b>		
COT 3100	Discrete Math I				
MAD 3107	Discrete Math 2				
MAC 2xxx	Calculus				
STA 2xxx	Statistics				

The Software Engineering curriculum has specialization courses in software specification and in verification and validation. The degree requirements are contained in the following chart.

M.S. Computer Science, Software Engineering Option Catalog Year 2005-2006					
Course	Undergraduate	Eval.	Course	Graduate	Eval.
<b>Foundational Proficiencies</b>			<b>Required Core Courses</b>		
CDA 3100	Microprocessor Systems		CDA 6158	Adv. Computer Architecture	
CEN 3031	Intro to Software Engineering		CEN 6064	Software Design	
CEN 4516	Computer Networks		CEN 6520	Adv. Computer Networks	
COP 4020	Programming Languages		COP 6025	Adv. Programming Languages	
COP 4600	Operating Systems		COP 6611	Adv. Computer Operating Systems	
COP 4601	Software Systems				
COP 4710	Database Systems		<b>Required Specialization Courses</b>		
			CEN 6070	Software Testing & Verification	
			CEN 6075	Software Specification & Implementation	
<b>Additional courses you may be required to take</b>			<b>Other Requirements</b>		
COP 2253	Programming in Java		CEN 6015	6 sh SE Project (+ 9 sh of approved electives)	
COP 3022	Intermediate Programming (Java)			(or)	(or)
CIS 3025	Science of Computing		CIS 6971	6 sh Thesis (+ 3 sh of approved electives)	
ENC 3240	Technical Writing			30 sh w/ Thesis - 36 sh w/ Project	
COP 3530	Data Structures and Algorithms		<b>Approved Electives</b>		
COT 3100	Discrete Math I				
MAD 3107	Discrete Math 2				
MAC 2xxx	Calculus				
STA 2xxx	Statistics				

## Academic Learning Compact (for each program)

This section contains the first Academic Learning Compact developed by the department. The department has formulated an ALC for the aggregate of our undergraduate programs. It is a goal of the department to formulate separate ALCs for each of the undergraduate programs and for the graduate program in the coming year.

UWF Computer Science graduates should be able to do the following:

### Content (CN)

1. **Demonstrate expertise in the main content knowledge of computer science:**
  - a. **Programming fundamentals**
  - b. **Discrete structures**
  - c. **Algorithms and complexity**
  - d. **Architecture and organization**
  - e. **Operating systems**
  - f. **Networks**
  - g. **Programming languages**
  - h. **Software development**
2. **Effectively use computer science frameworks (concepts, principles, theories) to explain computer facts, practices, or trends**
3. **Recognize the central role of data structures and algorithms, and apply fundamental programming skills to enable proper implementation of data structures and algorithms in software**
4. **Research and make use of emerging technologies in the computing field**

### Critical Thinking (CT)

1. **Critically analyze and apply a range of computer science concepts, principles, and practices in the context of solving problems across a range of problem domains**
2. **Demonstrate proficiency in software lifecycle principles, using a range of problem solving, programming, and software engineering skills**
3. **Develop applications based upon the computer science body of knowledge**

### Communication (CM)

1. **Demonstrate effective technical writing skills**
2. **Create and deliver effective oral presentations**
3. **Communicate effectively using technology, including selecting and using appropriate tools**

### Integrity/Values (IV)

1. **Recognize ethical issues in computing contexts**
2. **Articulate the responsibilities of a computing professional**

### Project Management (PM)

- 1. Develop and employ effective management skills to enable project planning, communication, and delivery**
- 2. Work as part of a team in the development of software systems**

Evaluation of Student Learning Outcomes

**In the Computer Science major, you will demonstrate specific skills in regard to data**

**structures, algorithms, programming, operating systems, databases, networks, and software engineering. Several upper level courses will give you the opportunity to identify and reflect on your best project management skill sets through the completion of**

**assignments that meet departmental standards and integrate what you have learned.**

**Opportunities to showcase your work will become available as your study progresses,**

**and these include the opportunity to participate in undergraduate research projects with**

**faculty, or to present the results of your work at university or external events.**

Job Prospects for Computer Science Graduates

**Programmer**

**Software Engineer**

**Computer Scientist**

**Systems Engineer**

**Systems Analyst**

**Data Analyst**

**Network Administrator**

**Database Administrator**

**Software Consultant**

**Technical Support Specialist**

*Find Out More about Computer Science at UWF: [www.cs.uwf.edu](http://www.cs.uwf.edu)*

Assessment Plan (for each program)

**In the period that is covered by this report, the department has made many changes to strengthen the quality of the courses offered and a number of changes to the programs that were deemed appropriate or necessary at the time. Decisions were made initially to attempt to deal with the extraordinarily high enrollments and the variability in the rigor with which many courses were taught, particularly by adjuncts who were insufficiently appraised of regular faculty standards. More recently decisions are in some degree being driven by the worrisome decline in enrollments. The challenge is to retain student while simultaneously retaining quality in the programs. Through much of this time, the department has lacked a carefully designed and methodically implemented plan to assess the fit between**

program offerings and the programs current and prospective students want to take. It is incumbent upon the department to carry out better planning for assessment.

The recent development of a comprehensive Strategic Plan as documented in Section 2, and efforts to meet the goals of the university's Quality Enhancement Plan constitute a start for improved departmental assessment planning, but much more needs to be done. The department has undertaken the development of an assessment plan for the academic programs to accompany the Academic Learning Compact. Since the Academic Learning Compact has not yet been articulated to address all programs separately, the current assessment plan does not either. The department has not commenced an assessment plan for the graduate program. The following is the current assessment plan for the undergraduate curriculum in the ALC.

"Our assessment plan describes how various measures will be used to evaluate learning outcomes, and how information from those assessment measures will be used. Our approach includes one direct measure of assessment and one indirect measure. The senior capstone courses will be used to directly assess learning outcomes. Data from students' learning experiences in those courses will be collected by the course coordinators and reported back to the department for review and any necessary revisions to our ALC and assessment plan. As an indirect measure of assessment, all graduating seniors will be given an exit survey. Data from that survey will be reported by the undergraduate advisor back to the department for review and any necessary revisions. In the first phase of assessment, we chose to focus on learning outcomes in two domains, specifically project management, in alignment with the major focus of the UWF Quality Enhancement Plan (QEP), as well as critical thinking, because it encompasses the identification and application of fundamental computer science knowledge and skills. In the second phase of assessment, we plan to incorporate the other ALC domains."

Student Learning Outcomes and Assessments (for each program)

**Program: B.S. Computer Science/Computer Science Option**

Student Learning Outcomes

*1. Students will have a rigorous foundation of computer science, including an in-depth examination of key issues and concepts inherent in the discipline of computing, including theory of computation, analysis of algorithms, data structures, and computer architecture.*

Outcome Assessment Measures

**Students must complete the core computer science courses with a GPA of 2.0 or greater.**

**In addition, each course must be completed with a minimum grade of C.**

**The most important measure of successful attainment of knowledge in the critical core courses is the student's performance in the capstone software systems course.**

**Outcome Assessment Data**

**The student's SASS audit record is an ongoing record of achievement, which reveals the assessment data to measure the level of attainment of student outcomes.**

**In order to standardize the student outcomes, the Department of Computer Science encourages frequent curriculum meetings to standardize and modernize course content. The level and consistency in course content as expressed in the syllabi is one measure of the minimum level of expected achievement by students.**

**In order to measure the student outcomes from certain key courses the department administers common final examinations in a single sitting.**

**Outcome Assessment Data Analysis**

**Results from common final examinations are reviewed to determine potential problem areas in the curriculum or course content.**

**Discussions in curriculum committee meetings result in recommended changes to the curricula and courses.**

**Reviews of peer programs at other institutions, recommendations from the ABET accreditation agency, and trends in the field of computer science as expressed by other outside organizations are conducted to consider changes to the curricula and courses.**

**Program Improvement Opportunities and Decisions**

**A detailed analysis of test data from the common final examinations initiates discussions in faculty meetings which may result in the development of CCRs to revise the curricula and courses.**

**An analysis of ABET recommendations initiates discussions in faculty meetings which may result in the development of CCRs to revise the curricula and courses.**

**A review of industry trends initiates discussions in faculty meetings which may result in the development of CCRs to revise the curricula and courses.**

*2. Students will have an overview of data structures and their implementation.*

Outcome Assessment Measures

**Students will be required to complete 9 credit hours of programming and data structures with a GPA of 2.0 or greater.**

**In addition, each course must be completed with a minimum grade of C. The most important measure of successful attainment of knowledge in the data structures courses is the student's performance in the subsequent courses in the program.**

Outcome Assessment Data

**The student's SASS audit record is an ongoing record of achievement, which reveals the assessment data to measure the level of attainment of student outcomes.**

**The performance in subsequent courses is a measure of the attainment of data structures knowledge.**

Outcome Assessment Data Analysis

**Results from common final examinations are reviewed to determine potential problem areas in the curriculum or course content.**

Program Improvement Opportunities and Decisions

*3. Students will understand and appreciate good software design principles.*

Outcome Assessment Measures

**The most important measure of successful attainment of knowledge and application of good software design principles is the student's performance in the subsequent courses in the program.**

Student Learning Outputs

*1. The number of students admitted to the program will meet or exceed the average University of West Florida faculty to student ratio.*

Output Assessment Measure

**(Number of students (FTE)) / (Number of faculty) > University average**

*2. Because admission to the program is not restricted or limited, retention may be below the University average.*

Output Assessment Measure

**Retention rate for UWF freshmen who declare computer science as a major > 30 percent**

**Retention rate for students entering with an AA degree > 60 percent**

- 3. *The number of students continuing to a Masters program will be 10 percent.*
- 4. *Students with a BS in CS will be employed at an average salary greater than \$25,000.*

**Program: B.S. Computer Science, Computer Information Systems**

- 1. *Students will have a firm foundation in the methodology (technical, economical, and managerial) necessary to design practical systems.*

**Outcome Assessment Measures**

**Students must complete the core computer science courses with a GPA of 2.0 or greater.**

**The most important measure of successful attainment of knowledge in the technical, economic, and managerial areas is the student's performance in the subsequent courses in the program.**

**Outcome Assessment Data**

**In order to measure the student outcomes from certain key courses the department administers common final examinations in a single sitting. In order to standardize the student outcomes, the Department of Computer Science encourages frequent curriculum meetings to standardize and modernize course content. The level and consistency in course content as expressed in the syllabi is one measure of the minimum level of expected achievement by students.**

- 2. *Students will have a firm foundation of data structures and databases and their implementation.*

**Outcome Assessment Measures**

**Students will be required to complete data structures and database systems with a GPA of 2.0 or greater.**

**Students must exhibit the ability to apply database systems to a project in the software systems or systems project courses.**

**Research Outcomes/Outputs and Assessments**

Summary of External Contracts & Grants					

Title	Dates	Agency	Amount	Investigator (s)	Comments on Nature of Grant
Naval Security Group Course Delivery	2001-03	Navy	\$1,922,792.87	John R. Arthur*	Provides training for Naval personnel
Fuzzy Edge Detection	1996-2002	ONR	\$565,759.00	Dr. James Bezdek	Research on the use of Fuzzy Set Models for the detection targets in LADAR image data
Mikkeli SE, Programme-Database Mgmt.	2000	Mikkeli Polytechnic	\$8,000.00	Dr. Edward G. Rodgers	To present lectures to engineering and business students in the Mikkeli International Program
Travel and Instructional Grant for the GBC MBA Program	2001	Human Resource Institute, Shenzhen, China	\$8,000.00	Dr. Edward G. Rodgers	To present lectures to MBA students in the GBC MBA Program and to visit sites and present lectures in X'aian, China
Mikkeli IBM Programme-Database Mgmt 2002	2001	Mikkeli Polytechnic	\$8,000.00	Dr. Edward G. Rodgers	To present lectures to engineering and business students in the Mikkeli International Program
Software Engineering and Database Systems	2003	Mikkeli Polytechnic	\$8,000.00	Dr. Edward G. Rodgers	To present lectures to engineering and business students in the Mikkeli International Program
Mikkeli Centre JAVA Programming	2004	Mikkeli Polytechnic	\$8,000.00	Dr. Edward G. Rodgers	To present lectures to engineering and business students in the Mikkeli International Program
Mikkeli Centre C++ Programming	2005	Mikkeli Polytechnic	\$8,000.00	Dr. Edward G. Rodgers	To present lectures to engineering and business students in the Mikkeli International Program
Grant Proposal Preparation for	2005	SCAC	\$2,000.00	Dr. Edward G.	To visit potential university partners for an

FIPSE EC/US Cooperation Program				Rodgers	EU-US exchange program
Understanding Software Features by Intergrating Dynamic and Static Analysis	2005/06	SERC Consortium & Motorola	\$ 30,000.00	Dr. Sharon Simmons, Dr. Dennis Edwards & Dr. Norman Wilde	Continue work with Motorola to integrate industrial and academic static and dynamic analysis tools.

Summary of External Contracts & Grants					
Title	Dates	Agency	Amount	Investigator (s)	Comments on Nature of Grant
Combining Tools for Feature Location and Understanding	11/2004-6/2005	SERC Consortium & Motorola	\$ 5,000.00	Dr. Sharon Simmons, Dr. Dennis Edwards & Dr. Norman Wilde	Started initial work with Motorola to integrate academically developed tools with industrial strength tools used at Motorola for feature understanding.
Large Scale Mammography Data Bases	1999-2002	Whitaker Foundation	\$208,080.00	Dr. Melanie Sutton Dr. James C Bezdek	Research on ways to accelerate image processing algorithms used on large images from mammographic databases
Dynamic Analysis of Test and Evaluation	1998-2001	Air Force	\$151,565.00	Dr. Norman Wilde	Adaptation of the Software Reconnaissance methodology for feature location to Fortran software typical of that in use in the Test and Evaluation Wing at Eglin AFB.
Total			\$2,933,196.87		

Grant Totals			\$2,980,558.87		
* no longer with the University					

Summary of Internal Grants					
Program Title	Effective Dates	Granting Agency	Amount	Investigator (s)	Comments on Nature of Grant Activities
Using Multi-level Traces to Locate Features in a Distributed System	Summer 2003	Faculty Summer Research Grant	\$6,250.00	Dr. Dennis Edwards	Using distributed execution traces to locate source code features
Development of Reusable Knowledge-based Tutoring Environment	Summer 2002	CAS Summer Project	\$5,000.00	Dr. Eman M. El-Sheikh	
Development of an Adaptive Student Model for Knowledge-based Learning Tool.	Summer 2003	SCAC Summer Research	\$6,250.00	Dr. Eman M. El-Sheikh	
Development of Reusable Learning Tool that Incorporates Concept Maps and Problem-based Learning	2003	UWF Alumni Association	\$1,872.00	Dr. Eman M. El-Sheikh	
An Adaptive Tutoring System for Teaching Object-Oriented Programming	5/- 8/2004	SCAC	\$1,990.00	Dr. Eman M. El-Sheikh	
Development of an Adaptive Tutoring System for Teaching Object-Oriented Programming	Summer 2004	Summer Research Award	\$6,250.00	Dr. Eman M. El-Sheikh	
Distributed Processing Laboratory	2000	UWF Small Grants for Research	\$2,000.00	Dr. John F. Kolen	Request for hardware and supplies for construction of distributed processing cluster.

Enhance Network Sni_er	2002-2003	Summer Research Grant	\$2,000.00	Dr. Sharon Simmons	Grant money was used to purchase hardware to allow the development of software for monitoring network traffic.
Run-Time Monitoring Methodologies for Distributed Systems	2004	Summer Research Grant	\$6,250.00	Dr. Sharon Simmons	Designed methodology for monitoring distributed system and applied for Motorola grant to continue this work.
“CEN5XXX-Object Oriented Methologies	Summer 2002	UWF Enhancing Teaching & Learning With Technology	\$2,500.00	Dr. Norman W. G. Wilde	Preparation of a reduced-seat-time version of this course to be taught using the Internet.
Distance Learning Project	2001	UWF	\$7,000.00	Dr. Edward G. Rodgers	Course in WebCT and the development of a database course for the Web CT environment
Internal Grants Total			\$47,362.00		

Service Outcomes/Outputs and Assessments

**Community/Public School/Economic Development Goals for the Department**

Public School Development Goal

**Establish and maintain interaction between the department and public schools to enhance public school programs, promote a free exchange of ideas and support good will.**

Outcomes:

**Member of the Computer Science faculty and staff shall participate in activities such as conducting guest lectures in area high schools, organizing and participating in reciprocating visits with regional public schools, and assisting with science related actives such as science fairs and programming contests.**

Measure:

**Total number of public school development activities reported in faculty and staff annual evaluations divided by the number of faculty and staff. On average, each faculty and staff member will participate in one such activity each year.**

Community Development Goal

**Establish and maintain interaction between the department and the community to assist in meeting community wants and needs in the area of information technology.**

Outcomes:

**Members of the Computer Science faculty and staff shall participate in activities such as service on advisory boards of civic and professional organizations, performance of community service spots on local media, collaboration with local community leaders to identify regional manpower needs related to information technology.**

Measure:

**Total number of community development activities reported in faculty and staff annual evaluations divided by the number of faculty and staff. On average, each faculty and staff member will participate in one such activity each year.**

Economic Development Goal

**Create and maintain scholarship opportunities for Computer Science Students via local area business participation.**

Outcomes:

**Members of the Computer Science faculty and staff shall contact local area businesses and request scholarship funding.**

Measure:

**Total number of local area business contacts reported in faculty and staff annual evaluations divided by the number of faculty and staff. On average, each faculty and staff member will contact at least one business each year.**

Creative and Scholarly Activities Goals for the Department:

**The faculty of the Department of Computer Science shall collectively sustain and strengthen the research communities within the Computer Science Department.**

Creative and Scholarly Activities Outcomes:

**The outcomes of sustaining and strengthening the research communities include**

- 1. Continued individual and collaborative research efforts**
- 2. Continued opportunities for undergraduate and graduate student research**
- 3. Better facilities and resources for research**

Enrollment Trends (7 years; for each program)

**Headcount (Fall)**

**FTE (Annual: Summer, Fall Spring)**

**Degrees Awarded (Annual: Summer, Fall, Spring)**

**Statistics pertaining to Enrollment Patterns, Majors, and Degrees Conferred**

**In a March 2005 article published in Computing Research, Jay Vegso notes the steady decline of undergraduate majors in Computer Science since 2000. Data**

collected from the 34<sup>th</sup> annual Computer Research Association (CRA) Taulbee Survey in the Fall of 2004 further supports the decline in enrollments at graduate and undergraduate levels as well as the decrease in degree production. The statistics from the survey on undergraduate degrees conferred indicates a residual influence of the high level of undergraduate enrollment that began in the late 1990s and remained strong until the early 2000s. As the downward trend in Computer Science seems to be continuing, logically the output of students with degrees in the field will also decline.

Unfortunately, our department has not been different than the national enrollment trend in the field of Computer Science. Since 2000, we have suffered a 38% decline in FTE's in our department (see Student FTE Table). Over the five years, the number of majors has declined 51% (see Majors Table) and the number of degrees conferred has decreased 43% (see Degrees Conferred Table). In addition to the national trends, our department has been impacted by military initiatives after September 11, 2001. The Northwest Florida region is comprised of a large transient population located at the surrounding military bases. The enrollment at our FWB campus located in close proximity to Eglin AFB has suffered a 61% decrease in enrollment since 2000 (see FWB Enrollment Table).

In the past five years, there are several other mitigating factors that have contributed to the decrease in enrollment in our department. The inception of the new Interdisciplinary Information Technology (IIT) major in the Fall of 2001 had an impact on the number of majors in Computer Science. In the Fall of 2001, the IIT major started with 42 students. After a 300% growth, the program now has 169 declared majors. Though these students do take a few courses in our department, they do not count in the major enrollment for our department.

Another notable impact on our department was the loss of the Naval Security Group Activity (NSGA) contract. In the NSGA program, military personnel were enrolled in intensive, permission-based courses taught in our department. The contract for this program ended in Fall 2003 after a decline in enrollment since 2000.

Finally, the MCSE certification program was shifted to the newly created Division of Continuing Education in the Spring 2002 semester. Therefore, the transfer of these courses outside the department further impacted the enrollment in our department.

Due to the national trends of enrollment in Computer Science programs, coupled with regional and local factors, it is obvious that our enrollment has been declining over the past 5 years. Now that these challenges have been identified, the department can focus on new strategies to stabilize the interest in our programs. With careful realignment of our degree content, hopefully the department will be more attractive to prospective students. Furthermore, an increased presence in area high schools and community colleges should benefit our recruitment efforts. Finally,

**our continued emphasis on student retention will help curtail the decline in enrollment.**

#### Curriculum

**Major Changes Since Prior Review  
Curriculum Map(s)**

#### Statutory Mandates

**Required Common Prerequisites (bachelor's only)**

**Credits-to-Degree Limits (bachelor's only)**

**Limited Access Status (bachelor's only)**

#### 1.11. Degree requirements

**The following documents the requirements for the undergraduate programs in Computer Science and Computer Information Systems, the minors offered by the department, and the degrees in the graduate programs.**

##### 1.11.1. Undergraduate Degree Requirements

**In addition to general University requirements, students seeking the B.S. in Computer Science must meet the requirements listed below. A grade of “C-” or better is required for all courses in the major with a cumulative major GPA of 2.5 or higher. Students are advised to check prerequisite requirements for all courses. Minimum grade requirements vary among departments. Students should consult with their academic advisor for courses which may satisfy both the General Studies requirements and common prerequisites.**

**Electives in both the CS and CIS options may be chosen from the following list, provided the course is not a degree program requirement, and the student has all the specified prerequisites for the course:**

**CAP 4401 Introduction to Digital Image Processing 3  
CAP 4410 Introduction to Computer Vision 3  
CAP 4730 Computational Structures in Computer Graphics 3  
CEN 4400 Introduction to Operations Research 3  
CEN 4540 Computer & Network Security 3  
CIS 4327 Systems Project 3  
CIS 4340 Software Methods for Remote Databases 3  
COP 3813 Internet Programming 3  
COP 3835 Web Based Programming 3  
COP 4173 Advanced Visual Basic Programming 3  
COP 4331 Object Oriented Programming 3  
COP 4710 Database Systems 3  
COT 4400 Analysis of Algorithms 3**

### **COT 4420 Theory of Computation 3**

Cooperative education courses (up to 3 credits) are also acceptable electives. Advanced topics courses (CAP, CDA, CEN, CIS, COP, and COT prefixes only) may be acceptable electives. In addition, 3000-5000 level electives that further the objectives of an individual program may also be chosen from the offerings of other departments (math, business, engineering, or the natural sciences). However, these additional elective choices require the approval of the Chairperson of the Computer Science Department.

#### Computer Science Specialization

##### General Studies (36 sh)

For additional information see the General Studies section of this Catalog. Students should take MAC 2311 and MAC 2312 to satisfy the mathematics component, PHY 2048/2048L and PHY 2049/2049L to satisfy the natural sciences component, and PHI 2603 to satisfy the humanities/values component of General Studies.

##### Common Prerequisites (25 sh)

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. Courses in brackets indicate substitutes from Florida public community/junior colleges and universities.

**COP xxxx** Introductory programming in Ada, C, C++, Pascal, or equivalent language 3

+MAC 2311 Analytic Geometry & Calculus I 4  
[MAC x311]

+MAC 2312 Analytic Geometry & Calculus II 4  
[MAC x312]

+PHY 2048/L University Physics I/Lab 4  
[PHY x048/x048L]

+PHY 2049/L University Physics II/Lab 4  
[PHY x049/x049L or x049C]

Two science courses for science majors 6

+ *Indicates common prerequisites which can be used to satisfy General Studies requirements.*

##### Lower Division Electives (0-12 sh)

Sufficient 1000/2000 level electives to complete at least 60 semester hours in the lower division. Current UWF students may use elective courses at any level (1000-4999) to meet this elective requirement.

Students should take COP 2253 as part of the common prerequisites or as a lower division elective.

Major (36-39 sh)

**CDA 3100 Microprocessor Systems 3**  
**CEN 4516 Computer Networks 3**  
**CIS 3021 Science of Computing 3**  
**COP 3022 Intermediate Computer Programming 3**  
**COP 3530 Data Structures & Algorithms 3**  
**COP 4020 Programming Languages 3**  
**COP 4600 Operating Systems 3**  
**COT 3100 Applications of Discrete Structures 3**  
**COT 4400 Analysis of Algorithms 3**  
**COT 4420 Theory of Computation 3**

*Choose two:*

**CEN 3031 Introduction to Software Engineering 3**  
**COP 4601 Software Systems 3**  
**COP 4710 Database Systems 3**

*If not taken in the lower division:*

**COP 2253 Programming Using Java 3**

**Major-Related (21-24 sh)**

**ENC 3240 Technical Writing 3**

**MAD 3107 Discrete Mathematics and Applications 3**

**MAS 3105 Linear Algebra 3**

**STA 4321 Introduction to Mathematical  
Statistics I 3**

**3000/4000 level electives chosen in consultation  
with advisor 9-12**

**List of pre-approved electives available in department.**

**Upper Division Electives (0 sh)**

Computer Information Systems Specialization

General Studies (36 sh)

**For additional information see the General Studies section of this *Catalog*.  
Computer Information Systems majors should take STA 2023 and MAC 2233 to  
satisfy the mathematics component, ECO 2013 to satisfy the social science/socio-  
political component, and PHI 2603 to satisfy the humanities/values component of  
General Studies.**

Common Prerequisites (27 sh)

**State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. Courses in brackets indicate substitutes from**

**Florida public community/junior colleges and universities.**

**ACG 2021 Principles of Financial Accounting 3**

**[ACG x021]**

**ACG 2071 Principles of Managerial Accounting 3**

**[ACG x071]**

**CGS 2570 Personal Computer Applications 3**

**[CGS x060, x100, or x570]**

**COP 2253 Programming Using Java 3**

**[Equivalent Java Programming Course]**

**COP 2334 Programming Using C++ 3**

**[Equivalent C++ Programming Course]**

**+ECO 2013 Principles of Economics Macro 3**

**[ECO x013]**

**ECO 2023 Principles Economics Micro 3**

**[ECO x023]**

**+MAC 2233 Calculus with Business Applications 3**

**[MAC x233]**

**+STA 2023 Elements of Statistics 3**

**[STA x023]**

***+Indicates common prerequisites which can be used to satisfy General Studies requirements.***

Lower Division Electives (0-6 sh)

**Sufficient 1000/2000 level electives to complete at least 60 semester hours in the lower division. Current UWF students may use elective courses at any level (1000-4999) to meet this elective requirement.**

Major (39 sh)

**CDA 3100 Microprocessor Systems 3**

**CEN 3031 Introduction to Software Engineering 3**

**CEN 4400 Introduction to Operations Research 3**

**CEN 4516 Computer Networks 3**

**CIS 3021 Science of Computing 3**

**CIS 4327 Systems Project 3**

**COP 3022 Intermediate Computer Programming 3**

**COP 3530 Data Structures & Algorithms 3**  
**COP 4020 Programming Languages 3**  
**COP 4600 Operating Systems 3**  
**COP 4601 Software Systems 3**  
**COP 4710 Database Systems 3**  
**COT 3100 Applications of Discrete Structures 3**  
**Major-Related (21 sh)**  
**ENC 3240 Technical Writing 3**  
**MAD 3107 Discrete Mathematics and Applications 3**  
**3000/4000 level advisor-approved electives 15**  
**Upper Division Electives (0 sh)**

Articulation with Feeder Institutions

**Articulation agreements and relationships with community colleges and local high schools.**

Accreditation Status

**There has been discussions about accreditation by ABET and this is particularly true in view of Electrical & Computer Engineering's recent renewal. At this point in time, accreditation is not a critical issue, but alignment to standards, industry needs (local and regional) should be addressed in program tracks.**

### **Responses to Recommendations from Previous Reviews**

**In 2004, Dr. Ed Rodgers filed a follow-up memo with the Associate Vice President Bachman regarding follow-up on recommendations from the prior review. The complete text of that report appears in Section 7.6. This section contains information that addresses the most significant, currently relevant points that are discussed in that memo.**

**Notable among the recommendations was the need for the faculty to develop a more strategic view of where the department and field is going and what we can do to best serve our constituencies. As this document indicates, a significant effort has been undertaken to establish a revised strategic plan for the structure of our programs, and the first strategic plan for evaluation and assessment of programs, for scholarly research standards and expectations, for service expectations, and for community outreach.**

**Quality control issues, particularly those relative to excessive reliance on adjunct professors, has been addressed. In Fall, 2005, all sections offered were taught by regular faculty. In addition, all the introductory courses have been arranged to have common assignments and final exams to ensure uniformity across individual sections.**

**The various concerns pertaining to graduate programs are the most difficult lingering issues. The goal of establishing a Ph.D. program seems further away than**

ever given the decline in doctoral program enrollments nationally and the current difficulties we are facing with the Master's degree programs. As noted in Section 1.2 serious debate regarding future directions for the graduate program is ongoing. Additionally, the external reviewers suggested that the Software Engineering Master's program might be offered on-line. This is another area in which strong debate is taking place.

The overall view of the faculty has traditionally been that computer science is better taught face-to-face. A sea-change seems to be taking place in light of the significant increase in competition for students, improved means of distance learning delivery and assessment, and the influx of faculty trained in distance learning methodologies. One of the three goals in the prototype Program Goals section off the Strategic plan described in Section labeled Summary of Strategic Plans and Recommendations for Improvement is a basic goal to increase accessibility to programs. One example of this goal as a work-already-in-progress is the fact that the department is offering two sections of a programming course on-line for the first time this semester.

Sufficiency of Resources and Support Services (to achieve goals/objectives)

Laboratory and facilities support. UWF funding of programs is constrained in a manner like so many of its peers through the generation of the ubiquitous FTE. Like many of the other science programs, CS needs labs and equipment in order to develop and maintain the curriculum and the scholarly activities of its faculty. However, and unlike the other sciences, the CS curriculum could be argued to necessitate a more rapid turnover of some technologies in the teaching labs and we note in this regard that some institutions opt for lease programs of key laboratory technologies. The CS laboratories and equipment have seen no upgrade and little maintenance during the preceding five years. Unix terminals date to pre-Y2K. There are no embedded systems lab modules. Networking and power supply to the labs are supposedly maxed out. None of the laboratory spaces comprise an area that facilitates an actively engaged student body or a community of learners. *What constitutes the optimal design and equipping of the learning environment for a CS program that exudes invigoration and vitality? Is this a cost we can afford or do we need to set our sights on a lower bar?*

The review team confirms the poor state of current equipment in the laboratories available to the Computer Science Department. Computer scientists' and computer science students' computer equipment needs go beyond that necessary for the general campus population. Computing labs should be state of the art. On a visit to campus, a prospective student should be impressed by the laboratories. Special purpose laboratories that match faculty research and teaching interests are needed. Embedded systems and networking are examples of potential special purpose labs.

**Strengths/Weaknesses/Opportunities/Threats (that support or impede achievement of goals/objectives)**

**This section presents a brief summary of the perceived strengths, weaknesses, opportunities and risks as culled from a faculty discussion.**

**Strengths:**

**One of the obvious strengths is the current small class sizes that have given rise to low faculty/student ratios. This means that students have excellent access to faculty. The successful rounds of faculty hiring has substantially improved the quality of the instructional staff. The department has made some inroads in upgrading facilities, equipment, and software as documented elsewhere in this report. Additionally, the interim chair has aggressively pursued additional infrastructure upgrades. Faculty expressed the opinion that campus life is a potential attraction for traditional-aged students. Another strength of the department the ability to create opportunities for students to do undergraduate research. Initiatives to modernize the curriculum are already making the curriculum offerings a strength.**

**Weaknesses:**

**The faculty identified several current weaknesses including the current lack of state-of the art equipment and facilities. Low enrollments, while increasing access to instructors, tend to limit the number and range of class offerings in any given semester. Faculty also cited the fact that the department is quite Windows-centric. Currently we can only provide limited hands-on experience for multiple platforms such as UNIX, Linux and Macintosh. As cited elsewhere, the UNIX machines are geriatric and Macintosh machines are essentially non-existent in the labs. Faculty are exploring ways to create a multi-platform lab which is part of the request to the Provost documented in Section 7.8.**

**Opportunities:**

**The faculty cited numerous opportunities. Initiatives to increase our online presence are already underway. In keeping with the Active Learning initiative in the Quality Enhancement Plan of the University, faculty perceive and are exploring opportunities to provide more active, lab-oriented teaching/learning activities. Faculty perceive a significant opportunity to increase outreach. Specifically, the last round of BRAC will result in a net increase of approximately 5000 people in the Eglin/Fort Walton Beach area, many of whom are in technical positions and will seek additional education and training. Representatives of the department have already contacted and are attempting to formalize a partnership with West Florida Tech, a high-technology high school in Pensacola. Others in the department seek an improved outreach to other high schools and junior colleges, and a stronger ongoing articulation with those entities. Faculty described the opportunity to strengthen in-house research**

projects, to institutionalize a continuous modernization of the curriculum, and to establish new lab spaces.

Risks:

By far, the most significant risk is manifest in the overall enrollment trends. These trends are worrisome at the undergraduate level, and program-threatening at the graduate level. The problem has both recruitment and retention aspects. The department must face the challenge of online programs housed elsewhere that are quite clearly in demand and that can encroach on our ability to recruit new students from our and surrounding areas. Retention is another problem that stems from the variability in preparedness of entering students. We have a substantial cohort of military students that are often transient, making degree completion problematic even for those who are doing well academically. It is clear that we must provide better accommodation to their needs if we are to recruit and retain them.

### **Recommendations from Current Review**

Department/Division

Issues and questions, by Leo ter Haar, Interim Chair

As the new chair of the department I felt it might be helpful to share some thoughts on the current context of the Department. As outlined in the Executive Summary of the Preliminary Draft of the Self-Study, the Program Review process currently unfolding is an experimental one. The Department and I are grateful to Dr. Lyman and the Provost for this opportunity and I believe input from the review team in a consultant capacity is timely and warranted. I also thought it would be an opportune time for me to raise some specific questions which I would like to see the review team address as the faculty and I begin to move the program forward in an environment rich in the challenges of the three R's: Recruitment, Retention, and Resources.

***Context.*** After last year's failed search for a Department Chair, the former chair and the Dean approached me with a proposal to serve as the interim chair for two years. As a newcomer to the Department nearly eight months ago, I knew little about either the state of the Department or its impending program review.

I do know that as a computational chemist with an engineering background, I have a high level of regard for the achievements of computer science as well as for

society's needs to have future contributions from young and energetic yet-to-be computer scientists. The discipline has had an impressive impact on my own teaching and learning and it has empowered countless like me to apply high performance computing and high-throughput discovery tools towards solving real problems in the world of materials science and engineering.

After nearly two years as Administrative Fellow in the Dean's office, and in the shadow of the developing School of Science & Engineering, it has become clear to me that the Computer Science Department has (should have) an integral role to play in the future of the College and the University. I also believe the Department has an untapped potential as a major outreach component of the University and as a potentially vibrant program that sh/could be "easily" represented at all branch campuses.

I believe the Dean and the Provost are advocates for a strong computer science program. They see CS as a vital citizen in a regional comprehensive university and I appreciate their concomitant high level of expectation. Unfortunately, the enrollment trends for the department are, in one word, alarming. So is the resource picture. I am blessed in that the faculty seem to have attained a keen level of awareness regarding their program's predicament and that now, they are eager and willing to pursue a multitude of options. It has forced me and the Department to engage in some lively debate that, for better or for worse, has led to the now affectionately referred to "marathon" department meetings. I seem to be the lucky one to have inherited many of the issues that must now be addressed and, with the department, must come to decisions in a time of extremely limited resources and against a backdrop of nationwide enrollment decline in CS.

It also means we have arrived at a point where the key decisions that are looming on the horizon also create opportunity. Curriculum changes are in the works and the CCR submissions will be in by the end of August. On the personnel front, several T&P decisions will soon come to resolution and several retirements may be coming along in the next five years. We have rekindled our dedication to the FWB area. We have reestablished contact with the Air Force. We have begun visiting the local schools. Assessment is underway for the first time this year. We have several budgetary requests submitted for equipment and facilities improvements. New outreach initiatives and gaming workshops for the local schools are being planned for the summer. Key alumni have been contacted. Online courses are being developed and examined. In collaboration with Karen Rasmussen of COPS we will be taking a hard look at the challenges and opportunities of the IIT program. We have developed an enhanced dialogue with ECE and expect to pursue some collaborative CS and CE projects next year after both departments get past their review and accreditation issues and if we can get an envisioned "collaboratory" established. Math is interested in pursuing more effective and efficient curricula that we have in common. In the Fall semester we will begin offering an Honors course in game programming; one of the few Honors science classes being offered.

We hope to have two courses from which Gen Ed requirements can be fulfilled. We have talked with Physics about opportunities for our students in their simulator project. So while most will claim the energy in the department is higher these days and some will claim the chaos at times seems too much, I believe progress is being made and will be possible for some time to come. But it requires a few questions.

*Questions.* As you read through these, please remember that I ask them in no specific order; I ask them with the bliss of ignorance; but, I believe that the Department will rise to the occasion and meet the challenges head on. I stand ready to discuss these at any point and look forward to input of all kinds.

1. **Laboratory and facilities support.** UWF funding of programs is constrained in a manner like so many of its peers through the generation of the ubiquitous FTE. Like many of the other science programs, CS needs labs and equipment in order to develop and maintain the curriculum and the scholarly activities of its faculty. However, and unlike the other sciences, the CS curriculum could be argued to necessitate a more rapid turnover of some technologies in the teaching labs and we note in this regard that some institutions opt for lease programs of key laboratory technologies. The CS laboratories and equipment have seen no upgrade and little maintenance during the preceding five years. Unix terminals date to pre-Y2K. There are no embedded systems lab modules. Networking and power supply to the labs are supposedly maxed out. None of the laboratory spaces comprise an area that facilitates an actively engaged student body or a community of learners. *What constitutes the optimal design and equipping of the learning environment for a CS program that exudes invigoration and vitality? Is this a cost we can afford or do we need to set our sights on a lower bar?*
2. **Regional presence.** As if the challenge of maintaining effective state-of-the-art labs at one campus is not enough, the Department has also been faced with the annual challenge of whether or not to maintain complete program offerings at the FWB campus in addition to the PNS campus; and there now seems to be a developing and strong desire – and opportunity – to offer the program on Eglin Air Force base. While this split effort may have been a wise choice in the growth-funded environment of the pre-Y2K era, the fact remains we are not funded for growth. Overall, this attempt to “please all” has been a drain on resources at both the Department and College level and it has been a strategy that has met limited success in terms of developing a solid reputation of the Department beyond Pensacola and along the Emerald Coast. *Specifically, given the NW Florida and SW Alabama populations we try to serve, is it reasonable for us to strive to simultaneously and independently serve a main campus, at least one branch campus, and an online campus, given that the program has technological needs mismatched by resources? Asked in an alternate fashion, is it fruitful to consider maintaining a presence at all locations or should there be a focal shift towards either a) meeting the needs of*

*a specific campus, or b) a more distributed approach that is independent of facilities and equipment (except remote servers) such as an online campus approach, in the hopes of “pleasing all”?*

3. **Online campus.** We have just begun to expand our online offerings to test the waters with regard to online effectiveness and learning models for various aspects of the CS/CIS/IT curriculum. We also believe it will take a few years of assessment data to verify learning outcomes in our particular population mix. Yet it is clear CS/CIS/IT programs elsewhere are continuously and often progressively migrating to the online environment. While the expected advantages are clear to some, and the anticipated disadvantages still loom for many, it simply is not clear to me that a wholly online program sh/could materialize within the next few years. *Assuming that the online competition will likely continue to garner their enrollments from our FTEs, do we even have a choice in the matter and must we go down the road of online programs?*
4. **The Nystul Endowment and faculty development.** This is particularly challenging to me because of the history behind the endowment, the needs so clearly evident within the Department, the stature of the current eminent scholar in the international CS community, and the limited data regarding what the Department can actually do with this resource. I believe we need answers. The Nystul monies in their current embodiment are dedicated to funding Professor Bezdek’s research activities in conjunction with his access to University (Pace Foundation) monies for his appointment to the Eminent Scholar program that Florida started some years ago but has since discontinued. Given that Professor Bezdek has given me his intention to retire upon identification of a replacement, it begs to raise the question of whether or not it is in the best interest of the Department to actually dedicate the Department’s Nystul funding support to a sole individual. *It is a difficult decision for me, but might the future of the department be better served by creating a new and more flexible Nystul program which would provide faculty development opportunities for up-and-coming faculty within the department? If so, what might some of the features of such a program look like?*
5. **Diversity.** In an effort to begin to establish more of a community within the program, we recently started up a new group known as Bits-n-Bytes. At the inaugural event, I was dismayed by the lack of underrepresented groups and women. The message hit home. As described in another question, I intend to take a hard look at the interactions that the advising and front office staff have had with the student population. I sense that the faculty have had their primary contact with students limited to their classes and, to me, that type of environment is generally fine and dandy for students who are comfortable in taking the initiative to approach faculty, but it has in my experience with

NSF and NIH programs proven to be faulty in terms of opening doors for all student. I believe the CS department desperately needs a “collaboratory” – again, described in a later question – to begin to nurture a community of learners that is inviting to all students. I have already asked Diana Walker to serve as our Science Outreach officer, and am pleased that she is taking on the challenge. *The question remains, if we can succeed in developing a collaboratory and can have more of the local high school students come share active experiences at UWF, especially with the faculty, are there other issues that you sense seem to stand in the way of success?*

6. **ITS.** While history is always wide and varied at institutions, it seems to me that a computer science department and an institutional IT group, in our case, Information Technology Services (ITS), sh/could share some common ground. In view of the three main tracks that our program offers (CS, CIS, IT) and given the need to develop and showcase leading technologies at a regional University, I wonder whether there are reasonable models for exploring areas of mutual benefit and interest. We have already experimented with the use of adjuncts from ITS and have also placed graduates among the ranks in ITS. *But specifically, are there curricular activities that could benefit the CS program as well as ITS, and therefore the University? For example, if the campus CIO were available, could s/he help round out our curriculum in areas of perceived weakness such as, e.g., ethics and professional values in an increasingly technological society?*
7. **Staffing.** The department is staffed with technical expertise that overlaps with staff in ITS, as well as needs for expertise in the broader College setting. In its current structure, these employees are often willing to lend their support elsewhere, but are often met by institutional or bureaucratic obstacles. Likewise, others across campus may be willing to contribute to the CS mission; for example, those in ITS or in other academic units. One thought that comes to mind is a melding of the technical support staff across the College, and perhaps ITS, if greater efficiencies and lower cost could obtain? A case in point: Is it really necessary to continue to dedicate department energies and resources to those types of network facilities that duplicate the ITS or College missions such as, e.g., email, network, and webpage maintenance just because “we are CS and we are different.” *Must a CS intranet be a complete duplication of the resources provided by ITS, or could this become a more collaborative enterprise across, say, ITS and other technology intensive departments across all colleges?*
8. **Continuing Education and the Microsoft IT Academy.** Cont. Ed. is a clear plus to the campus but it seems to also draw people away from CS credit-earning courses if one’s immediate job requirements are satisfied by intensive quick-take coursework. And unlike some other traditional college

programs across campus, where extended study is the norm and sometimes the only option, the fact remains that the IT workforce environment allows many potential students to satisfy one's appetite for "instant" financial stability and career advancement with "quick" certificate based study without further dedicated college work; and this is a bona fide competitive pressure for us if you listen to some students. But perhaps this can be turned to advantage. *Are their underutilized recruitment activities that could be undertaken by the Department that would let us take advantage of this segment of the IT market, or is it lost territory and therefore a non-starter for CS departments?*

9. **Research opportunities.** Of the research faculty, the focus seems to be in distributed systems, clustering, AI, and software engineering. There seem to be budding interests in game development, online learners, modeling and simulation. Professor Ken Ford and his IHMC enterprise are now for all intents and purposes withdrawn from the Department. Professor Bezdek's research agenda has primarily taken him abroad and, his mentorship of Melanie Sutton in the area of bioinformatics has led to her departure to join the Biology Department. And while there has been an impressive success rate for the group led by Professor Wilde, few other research activities have garnered resources for the Department in the last five years. *It therefore begs to ask the question, is this a healthy mix and perhaps sufficient to maintain a CS program, or should a key area of expertise be sought out and developed over the next three years keeping in mind the technological climate to our east that will be developing with the increased presence of the military?*
10. **Software Engineering.** Opportunities in SE seem to be screaming at us the loudest from every direction, but the numbers are simply not there at the current time to justify a shift in resources. If, as many say, SE would "take off" if only we supported the program more at Eglin, one has to wonder what the proper complement and genre of faculty would be but that we do not currently possess. *Might this perceived need for SE be a real opportunity in terms of us developing new and timely curricula for a SE program that could be strategically targeted to real-time and embedded systems work in the FWB/Eglin area? If so, what might be the targeted areas of expertise?*
11. **Graduate Program.** The decline in graduate program FTE production speaks volumes when one considers the headcount exceeded 120 five years ago and stands under 20 this current year. Curriculum restructuring led by Professor Bezdek nearly five years ago was in response to the excessive numbers of applicants circa 2000 and the Department's need for more stringent entrance requirements in order to limit the enrollment. Stringent math prerequisites essentially drove the SE program into nonexistence. We now find ourselves at the other end of the pendulum's swing and wonder whether the program offers the flexibility that is often a key characteristic of

- trademark graduate programs. Again, this could simply be a downturn that mirrors the backdrop of the nationwide decline. *Might there also be notable internal reasons ranging from anything that might be construed as a lock-stepped “out-of-touch” program to perhaps an “out-of-date” program because it does not facilitate contemporary topics at the rate that would be considered healthy for a CS/SE graduate program?*
10. **Marketing.** We are particularly concerned about how we should approach our marketing with regard to our immediate competitors. Unlike many of the other programs on campus that appeal mostly to the traditional college aged population, we must be prepared to appeal to the non-traditional working adult who likely has many other options. This will be particularly true for the FWB/Eglin community where we would like to attract both the military families and the contractor base represented by the aerospace and munitions community. *While the Department website is certainly not an exemplar to other departments on campus and is in need of major reform, should valuable resources be going to this form of marketing or would more direct forms of outreach to the local bases, companies, high schools and community colleges be better placed in the near term?*
  11. **Competition.** Some have said in no uncertain terms that our neighbors such as Troy State are beating us hands down. If this is so, and the reputation of the Department as “unfriendly” and “unwilling” to accommodate student needs is at the heart of the matter, then only time and good behavior can rectify the situation. *On the other hand, if the curriculum is at the heart of the matter, are there any curricular changes that should be apparent and that would actually help matters?*
  12. **Military.** The Eglin community presents a major opportunity over the next 5 – 10 years as base realignments direct additional high skill labor to the Emerald Coast region. Given that military personnel and those employed by industrial contractors (who range from the small business to the major corporations) will be continuing to migrate to the FWB area, it seems our curriculum should begin to accommodate the technical and scientific computing community. Yet there will be no new faculty resources and I have been a strong advocate of low-level adjunct usage. As an additional complication, preliminary indications are that if we are to be successful with our outreach to the military, we need to be able to accommodate nontraditional semesters and nontraditional scheduling. At the same time, the institution is demanding 60% of our courses be traditional MWF courses. *How should I meet the challenge of spreading the Department’s resources over three campuses with non traditional scheduling and without major negative impact on enrollment at the PNS campus where faculty workloads have been normalized and adjunct usage has been brought to its proper level?*

13. **Assessment and curriculum accountability.** There is limited to nonexistent assessment data in the department for the past five years. And yet there has been a plethora of courses that have been added and few that have been deleted. For the most part, the operating procedure has been to offer all courses all the time. To date, I can determine little rationale for what and how course have been offered. Only this semester have I begun to implement a three-year scheduling process... and to the great discomfort of a few for whom all-courses-all-the-time is simply easier to schedule.... but one has to start somewhere. At the same time, not all faculty are willing or capable of teaching all the offerings. As with many programs, the adjuncts and lecturers carry(ied) much of the program with regard to FTE production because of the service load. Take for example the “PCA” course (Personal Computer Applications) This has morphed into a course primarily, if not entirely, focused on Microsoft Office. Is this a course that should be seen as defining of the Computer Science Department? With increasing numbers of students coming to campus with “extensive” high school and even middle school experience in these applications, if and when should this course go the route of “Slide Rule 101” that predated scientific calculators? *In the absence of assessment data and strategic planning, are there courses in the curriculum that could be sacrificed in the near term to help right-size the department’s scheduling and staffing requirements?*
14. **Workloads of Lecturers, Tenure Tracks, and Adjuncts.** With the startup of the IIT program three years ago (without additional resources) the course load that the department has had to carry is beginning to exceed the faculty at hand. Add to that the complication that one or two boutique courses could be in the daily mix and I begin to worry about the climate of the department. *With this year’s decision to go to a zero-adjunct staffing level and with no assessment data as the background to this question, how might we go about deciding the best mechanism for course rotation so that we maintain a versatility among the faculty while traversing an era of program reform?*
15. **Contributions to Interdisciplinary programs.** I have a strong background in, and am an outspoken advocate of, interdisciplinary and multidisciplinary programs and activities. With that said, the IIT program presents me a personal challenge because of how I view interdisciplinary programs: they should generally be more demanding of the student and typically require mastery of more than “one” set of skills. The IIT program, as witnessed by the enrollment pattern, has siphoned majors from the CS and CIS programs where the “math” requirements are more stringent. As a result, the word among the students is that the IIT program is easier, not just different. CS students and IIT students seem not to get along in the shared classes. Some courses seem a misfit for one or the other. Some would also claim that the IIT program was structured as a retention tool, and I believe that is

- somewhat accurate. So here is the difficult question. *Would it be better to separate the IIT enterprise (and faculty) from its entanglement with the CS program (and others), so that the CS program and faculty can truly be assessed as a CS program, and not one that is governed by the needs and requirements of an IT program? (And would that benefit IIT as well?)*
16. Accreditation. I have been able to detect that there has been discussions about accreditation by ABET and this is particularly true in view of Electrical & Computer Engineering's recent renewal. I have looked at the materials for accreditation and I do not see it in the cards; am I missing something? *Should the department be considering accreditation since, as some claim, we are the only unaccredited CS program in the state?*
  17. Advising. Since pre-Y2K days and the evolution of the IIT program, the department has been able to benefit from a staff position dedicated to advising. (I do not believe that without the IIT program our current FTEs would support such a staff position.) While there are many pluses to this and the department has in general reaped the benefit, some faculty have reported concern that they no longer get to "see" students. As a side consequence, faculty spend less time visible to the students. Given that 400-600 majors do indeed justify a departmental "academic" advisor, I do worry that students do not receive adequate "career advising" from the mainstream faculty until they have been in their courses and only if the student takes the initiative. *Is there a reasonable model for bridging the academic advisor model currently in use with a more faculty-involved model that would likely contribute to more community building as well?*
  18. Curriculum reform. This is the big one that folds into many of the other questions being asked. Since my first days with the department, we have been discussing the appropriate outcomes, curriculum maps, and assessment tools that might work for this mixed CS/CIS/IT department and its programs. *Are all central CS themes successfully captured by our program and course offerings, or are there outcomes and themes that are sorely missing? In particular, are we trying to do too many things or too few?*
  19. Specializations and tracks. Another big one. Talk in the department these past few months always gets bogged down in the similarities and differences between the principal tracks of CS, CIS and IIT. *Are these tracks sufficiently different in their implementation to continue supporting them as three tracks? Should they be?*
  20. Competing curricula. I believe that one of the major challenges CS faces is the manner in which technology itself is rapidly changing and that the nature and application of computing itself must change. As a "chemist" I am all too

familiar with the death and rebirth of the chemistry as discipline into all sorts of other manifestations. The fact of the matter is that there are other “computer” majors available on campus, and to many incoming students primarily concerned with that first job upon graduation, it does not seem clear to me that CS – the formal CS – should be seen as a large program, and therein lies the hitch. CS at UWF can not necessarily be compared to CS at another university because at one institution the engineering component might be included and at another one it would not. *With the other three departments of Computer Engineering, Management Information Systems, and Engineering Technology, and the IIT program, how large might one reasonably expect CS to be at UWF?*

21. Collaboratory. CS could benefit from more extensive collaborations with other departments across campus and members in the community. It would help with recruitment, retention and reputation. Similarly, much of the coursework in CS and in particular SE could benefit from team-oriented learning models based on group problem-solving and – dare I say it – discovery in a flat world. It would lead to more project oriented instruction and therefore assessment. It would lead to real-world scenario simulations and project management skills that teach accountability, civic responsibility and engagement. In short, I believe the “collaboratory” could help bring a trademark to this department that would facilitate recruitment and yield production of highly sought after graduates. *What might be some of the activities that could lend themselves to active instruction and collaborative learning in service to a collective CS program?*