



Indiana University South Bend

Department of Computer and Information Sciences

5 Year Plan (2005-2010)

This document attempts to explain the current state of the Department of Computer and Information Sciences and to project its expected growth in the next five years¹. The plan reflects the department's educational, research, interdisciplinary and outreach mission. It examines the following eight components:

- 1) New Degree Programs
- 2) Students
- 3) Faculty
- 4) Laboratories (Hardware, Software and Network)
- 5) Library Conspectus
- 6) Community Outreach
- 7) Accreditation



¹ Given the dynamic nature of our discipline, this plan will be reviewed and revised on an annual basis.

New Degree Programs

Current State / Recent Developments:

M.S. in Applied Mathematics and Computer Science was approved in 2001 and reaffirmed in 2002. Starting Fall 2002, the department began offering courses in this program.

M.S. in Management Information Technology was approved in 1999. This program is a joint venture between School of Business and Economics and the Department of Computer and Information Sciences.

B.S. in Informatics was approved in 2003. Starting Fall 2003, the department began accepting students in this program.

Certificate in Computer Applications: was approved in 2004. The goal of this program is to provide computer training for non computer science majors, as well as those in our region who seek a comprehensive and meaningful computer proficiency and certification.

Certificate In Technology for Administration: This is a graduate level Certificate. The thrust of this program is to provide timely and high quality technical expertise to employees in our regional business community. Starting Fall 2002, the department started offering this certificate.

Certificate in Applied Informatics: This is a graduate level Certificate designed to provide students with various backgrounds the ability to obtain the applied and technical skills necessary to enhance their productivity. Starting Fall 2003, the department began accepting students in this program.

Minor in Informatics: This minor can greatly enhance the job prospective of students in various disciplines by providing them the applied computer and technical expertise necessary for their chosen fields of study. Starting Fall 2002, the department began accepting students in this program.

Future Goals:

Master of Science in Computer Science / Software Engineering: The department will study the feasibility and impact of a new MS in Computer Science with concentration in Software Engineering.

Certificate in Software Engineering: The department is developing a new graduate level Certificate in Software Engineering. The goal of this program is to provide post graduate expertise to students with computer science degrees, as well as those from other technical and engineering disciplines in our regional business community.

Computer Certification for Education Majors: The department is planning to study the feasibility and impact of a new certificate in computer science for education majors.

Student Recruitment

Current State:

Currently the computer science program has about 175 declared undergraduate majors. With the advances in technology and its effects on the job market, we anticipate that this number will grow. In addition to the growth in our undergraduate program, we project that our joint masters programs with Mathematics and Business and Economics will add about 30 to 50 graduate students to our program.

In order to better focus our efforts at recruitment, the department has formed an external affairs committee. This committee is active in a number of areas such as:

- ❖ Presentations and fostering partnership at local high schools.
- ❖ Supporting the South Bend School Corporation's IT Magnet Program.
- ❖ Development and refinement of our departmental web site. Design of specific resource pages for high school students. Presentation of most departmental documentation on the web.
- ❖ Development articulation agreements with local 2 and 4 year colleges.
- ❖ Development and refinement of our departmental paper documentation.
- ❖ Development of departmental newsletters and flyers.
- ❖ Faculty presentations (on campus as well as local industry)
- ❖ Invited speakers
- ❖ WVPE radio ads

Future Goals:

In the next five years, the department hopes to increase its undergraduate enrollment by approximately 15%. This goal requires greater emphasis on recruitment of local and regional high school students for our undergraduate program. The department also hopes to increase its female and under-represented minority enrollment. Similarly, we hope to develop a high quality and competitive graduate program in Applied Mathematics and Computer Science. Our goal is to recruit graduate students from local, national and international sources.

Faculty

Currently the Department of Computer and Information Sciences has 10 full-time and a number of part time faculty. In order to attract and retain talented and dedicated faculty the issue of pay equity must be addressed. Unless salaries are competitive with those at other IU campuses and other similar universities, our ability to maintain a quality Computer Science and Informatics program may be compromised.

In Progress:

Currently, the department is seeking to hire and/or replace three faculty positions in support of our computer science, informatics and the graduate program in Applied Mathematics and Computer Science.

Future Goals:

In accordance with our future goals in developing new programs and recruitment of students, the computer science department hopes to increase the number of full time faculty members to 11 by the year 2010.

We plan to seek support from our administrators to enhance our faculty recruiting and retention.

- Improved support for professional development
 - ❖ Increased funding for attending professional conferences.
 - ❖ Full support for presenting at professional conferences.

- Improved support for adjunct faculty development
 - ❖ Substantial increase in funding for salaries paid to adjunct faculty to reflect market value.
 - ❖ Inclusion of benefits such as health insurance for adjunct faculty.

- Improved support for the use of technology in our classrooms
 - ❖ Continued support for computer science laboratories.

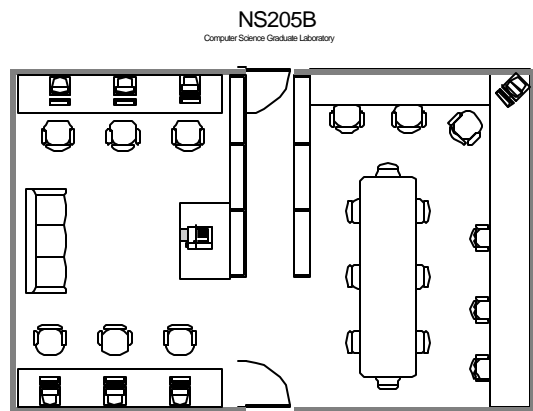
- Increased funding for salaries and faculty hiring
 - ❖ Providing competitive salaries to better support departmental hiring efforts.
 - ❖ Periodic salary adjustments to reflect market value.

Laboratories

Currently our department supports and maintains 5 laboratories. Two of these are open to all computer science undergraduates beyond C151. The third laboratory is available to graduate students and is currently under development. The fourth laboratory is currently dedicated to students in the informatics program. The fifth laboratory is dedicated to faculty and student research in the informatics area. In the future, we plan to add two new experimental laboratories for faculty and graduate student research projects.

In Progress:

Currently, a graduate laboratory is being developed in NS 205B. We hope to have this lab operational by Spring 2006.



Future Goals:

In accordance with our future goals in developing new programs and recruitment of new undergraduate and graduate students, the computer science department hopes to increase the number of laboratories and improve their functionality. Our plans should address and provide for innovative and technology oriented teaching and research in areas of faculty expertise. In addition our future plans include real time distance learning facilities as well as the ability for local and wide area distributed computing.

Lab Hardware:

Currently our department operates one Linux server and one Windows server to support the computer science program. In addition, two additional servers are used to support our informatics program. These computers serve a total of 90 Linux and Windows workstations. All courses beyond C151 (for computer science) and beyond I101 (for informatics) are supported by these machines in our laboratories. Currently, the department runs a 100 megabits switched network, as well as an experimental 20 megabits wireless network. Also, during the summer of 2003 the department upgraded the processors, memory and other necessary components in approximately 24 of its laboratory computers and servers.

Future Goals:

The department's laboratory committee continually evaluates the hardware, software and networking facilities in our laboratories. We will continue to upgrade our hardware, software and networking. Such an upgrade may include support of wireless communication throughout the Northside Hall, development of an AI research laboratory, development of high speed networking laboratory, and the expansion of our current Beowulf cluster.

Hardware Specifications

Servers:	Specification:	Naming Scheme:
File Servers: <ul style="list-style-type: none"> <input type="checkbox"/> Machine/CPU: <input type="checkbox"/> Memory: <input type="checkbox"/> Disk Size: <input type="checkbox"/> CD/RW: <input type="checkbox"/> Network Adapter: <input type="checkbox"/> Monitor: 	<ul style="list-style-type: none"> >= Current processor speed >= 512+MB >= 200+ GB (RAID) >= Current speed >= 100 Megabits >= 19" color or 18" LCD monitor 	CSfile0 - 9 Type: Linux or Windows 2000 servers
Backup/Web/mail Server: <ul style="list-style-type: none"> <input type="checkbox"/> Machine/CPU: <input type="checkbox"/> Memory: <input type="checkbox"/> Disk Size: <input type="checkbox"/> Tape Size: <input type="checkbox"/> CD/RW: <input type="checkbox"/> Network Adapter: <input type="checkbox"/> Monitor: 	Same as file server + specific hardware such as tape drives for the backup server	CSbackup0 - 9 CSweb0 -9 CSmail0 - 9 Type: Linux Servers

Clients:	Specification:	Naming Scheme:
<ul style="list-style-type: none"> <input type="checkbox"/> Machine/CPU: <input type="checkbox"/> Memory: <input type="checkbox"/> Disk Size: <input type="checkbox"/> Floppy: <input type="checkbox"/> CD/RW: <input type="checkbox"/> Network Adapter: <input type="checkbox"/> Monitor: 	Same as file server + monitor or 18" LCD monitor	CS00 - CS99 Type: Linux or NT clients

Lab Software Environment:

Plans are currently underway to define a set of software systems required for our laboratories. These include operating systems, compilers, editors, debuggers, CASE tools, computer graphics tools and libraries, artificial intelligence tools, database tools, GUI tools, networking libraries and simulators for various courses².

In Progress:

The current Linux and Windows workstations provide the basic operating system and applications necessary to support the majority of the courses offered by the Department. However, a number of other courses such as programming languages, computer graphics, database systems, systems analysis and design and operating systems require additional software tools and libraries. Most of these tools are collected by the faculty responsible for teaching the course and installed and used on a case by case basis.

Future Goals:

Our goal is to provide the users with the software environment detailed in the accompanying *Computer Science Software Specifications*, adapting these specifications in response to the changing needs of our students as well as to more general changes within the discipline.

²

More details are provided later in this document. See *Computer Science Software Specifications*.

Computer Science Software Specifications

Operating Environment:

- Operating System: Linux, Windows 2000/NT
- Windowing Environment: X Window, Motif, Windows, etc.

Programming Environment:

- Compilers and Interpreters:
GNU C++, Visual C++, Basic (.Net), Pascal, Lisp, scheme, ADA, PROLOG,
Java
- Editors: Vi, Emacs, ee, etc.
- Debuggers: X window Debuggers, Visual C++ debugger, etc.
- Libraries: (BSD Socket, Win-Sock, X-window, Light Weight Processes, Motif)

Software Engineering Tools:

- Integrated code development environment for our primary language (currently C++)
(Visual C++ IDE, .NET) (Cygwin, a Linux-like environment for Windows)
- CASE tools (Structured and Object Oriented)
Software that facilitates code sharing, communication and group work among
students. Upper and Lower CASE tools, Analysis and design tools, Project
planning and management tools. Code generators, reverse engineering tools,
etc. (Easy CASE, Visual Analyst, Excellerator)
- GUI tools
Visual Basic, JAVA, Visual C++, Borland Delphi, C++ Builder
- 4GL tools and program generators
- Databases (Postgres, MySQL, MS Access, SQL Server, XML, Data-mining)

Office Automation Tools:

- Word Processors (Latex, Word Perfect, MS-Word, Adobe Acrobat Writer, etc.)
- Presentation Tools (Power Point, etc.)
- Drawing Tools (WP-Draw, Visio, etc.)
- Spread Sheets

Networking and WWW tools:

- Berkeley Socket Library
- Web Browsers (FireFox, Netscape, Internet Explorer, Lynx etc.)
- Web Servers (Apache, etc.)
- HTML editors (MS Front page, Netscape composer, Corel Web Designer,
Macromedia Flash)
- JAVA programming language (SUN's JDK, MS Visual J++)
- CGI and Perl, Tcl/Tk.

Miscellaneous Libraries and tools:

- Thread Libraries
- File organization Libraries (ISAM, B-tree, etc.)
- WordNet (A lexical database for the English language) (NLP tool)
- MathLab

Library Conspectus

Current Status:

The departmental library committee had made excellent progress in making the majority of ACM (Association of Computing Machinery) publications available to our students.

In Progress:

The department is currently working on increasing the library collection as it relates to graduate programs such as MS-MIT and MS in Applied Mathematics and Computer Science programs.

Future Goals:

Our goal is to continue to improve our library holding for our undergraduate and graduate programs in computer science. In addition, we will be actively engaged in developing the library holdings in the area of Informatics.

Community Outreach

Current:

Continue to support faculty and student volunteering efforts

- ❖ Continue to provide expertise in computer science to our local and regional non-profit organizations.

Increase our interaction with local and regional educational institutions

- ❖ Seminars, conference, lectures, etc.

Increase our course offering for non-majors and community members

- ❖ A107, A150, A201, A338, A340

Increase departmental sponsorship of public presentations.

Creation of the first Endowed Scholarship in Computer Science.

- ❖ The John P. Russo Scholarship for Academic Excellence in Computer Science.

Future Goals:

Increase our technology transfer efforts

- ❖ Continue to provide relevant and timely course offering to meet the technical needs of our community.

Improve our fund raising for scholarships

Internship

- ❖ Increase student internships in local and regional organizations.
- ❖ Implement a Faculty Internship initiative, whereby faculty will serve as resident experts in one of the local or regional organizations, studying and analyzing the information technology issues that pose technological difficulties for these organizations.

Creation of the Second Endowed Scholarship in Computer Science.

- ❖ The William J. Knight Scholarship for Academic Excellence in Computer Science.

Accreditation

The department hopes to prepare for accreditation of our Bachelor of Science in Computer Science by the Computer Science Accreditation Board (CSAB). Achieving accreditation will only serve to externally validate the quality that already exists in our BS program. We hope to initiate our accreditation process during the 2007-2008 academic year.