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CLOSING THE CIRCLE – MOVING IT STUDENTS ON TO A BACHELOR’S DEGREE

David M. Keathly
CSE Faculty, UNT College of Engineering
Founder and VP, Kornerstone Knowledge, Inc.
Senior Staff, Convergence Technology Center



THE IT EXPLOSION

- *I think there is a world market for maybe five computers.*
Thomas Watson, chairman of IBM, 1943.
- *This 'telephone' has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us.*
Western Union internal memo, 1876.
- *640K ought to be enough for anybody.*
Bill Gates, 1981
- *have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won't last out the year.*
The editor in charge of business books for Prentice Hall, 1957.
- *But what ... is it good for?*
Engineer at the Advanced Computing Systems Division of IBM, 1968, commenting on the microchip.
- *There is no reason anyone would want a computer in their home.*
Ken Olson, president, chairman and founder of Digital Equipment Corp., 1977



IT PROGRAMS

- Most of you here offer some variety of a 2 year technology program leading to an A.S. or A.A.S. degree
- Many traditional and non-traditional students are partaking of these programs in growing numbers
- Industry is interested in employees with key IT skills and hands-on experience
- Some jobs also require a Bachelor's or even an advanced degree



OPTIONS?

What options are available to students completing 2-year technology programs?

1. Get a job
2. Go on to a 4 year program
3. Combination of 1 and 2

But the 4 year degree path has a few stumbling block

- Transferability of technical courses
- Finding a program that complements and enhances their existing training and experience

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WHAT KIND OF DEGREE DO WE NEED?

○ Information Technology

- Support the users of technology
- Support the creators of new technology
- Seamlessly integrate technology into our offices, workflows, homes and other institutions
- Manage technology resources efficiently, effectively and safely

● Experience in:

- Networking
- Security
- Convergence
- Software development
- System Administration
- Project management
- Web development and management
- Database technologies
- And more...





B.A. IN INFORMATION TECHNOLOGY

A new program from the Computer Science and Engineering Department at UNT



WHY A NEW PROGRAM?

- Input from Industry, students and Community college programs
- Projected Demand
- HB-1 (Texas)
- “Closing the Gap” (Texas)
- Local and national funding initiatives

Ten-year Workforce Demand to 2014

	% increase	1,000s	Annual Rate %
Network systems & data communications analysis	54.6	126	4.45
Computer software engineers, applications	48.4	222	4.03
Computer software engineers, systems software	43.0	146	3.64
Network & computer systems administrators	38.4	107	3.30
Database administrators	38.2	40	3.29
Computer systems analysts	31.4	153	2.77
Biomedical engineers	30.7	3	2.71
Environmental engineers	30.0	15	2.66
Personal financial advisors	25.9	41	2.33
Actuaries	23.2	4	2.11
Accountants & auditors	22.4	264	2.04
Financial analysts	17.3	34	1.61
Engineers, all	13.4	195	1.27
Engineering managers	13.0	25	1.23
Overall workforce increase	13.0		1.23
Architects & engineers	12.5	315	1.18
Electrical engineers	11.8	18	1.12
Computer hardware engineers	10.1	8	0.97
Electronic engineers, except computer	9.7	14	0.93

HOW DID WE START?

- Industry Working groups
 - Departmental and college advisory councils
 - Open forums with area IT employers
- Student input
 - What would they like to see? Open forums and other feedback
- Community College forums
 - Meetings with IT and other technology faculty at schools in our area
- A two year process to consolidate initial input, create a sample curriculum, review it with potential stakeholder and incorporate their feedback



GOALS, CONSTRAINTS AND CHALLENGES

- Valuable to area industry
- Maximize potential transfer credits
- Eligible for ABET accreditation
- Meets the requirements for College of Engineering programs
- Provides opportunities for transfer of courses and curriculum to community colleges
- Maximize opportunities for hands-on experiences
- Diverse background in IT topics in required courses
- Flexibility for students to design their own specializations



PROGRAM REQUIREMENTS

- 121 Hours minimum with 42 advanced hours
- 12 hours of science with labs
- 10 hours of Mathematics
- 6 hours of Advanced Oral and Written Communications
- 39 required hours in Computer Science and IT including 9 hours of advanced technical electives
- 18 hours in supporting courses
- Revised university core (27 hours plus Engineering courses that satisfy core – 42 hours total)
- This degree can also be configured to participate in the Teach North Texas program with teacher certification using the specialization component. These teachers can teach Computer Science and Technology courses in Secondary schools.



UNIQUE FEATURES

- Two project sequences
 - 2 semester freshman project introduces large scale development and modern tools first – the inside-out approach to Computer Science and IT
 - 2 semester senior design capstone sequence takes student thru the entire product development lifecycle
- 9 hour CS/IT concentration
- 18 hour Support area permits further specialization of an interdisciplinary nature

- Pre-Med
- Pre-Law
- Pre-MBA
- Game Development
- Criminal Justice / CSI
- Information Security

- Communications and Networks
- Technical Management
- Computational Life Sciences
- And many others



BASIC REQUIREMENTS

- Engineering Core Requirements
- **LABORATORY SCIENCES** (12 Hours; Choose 3 courses with labs)
- BIOL 1710-1730 (4 Hours)
- BIOL 1720-1740 (4 Hours)
- CHEM 1410-1430 **or** 1415-1435 (4 Hours)
- PHYS 1710-1730 (4 Hours)
- PHYS 2220-2240 (4 Hours)
- **MATHEMATICS** (10 Hours)
- Math 1710 – Calculus I (4 hours)
- Math 1780 – Probability Models (3 Hours)
- Math 2770 – Discrete Math (3 hours)
- **ORAL / ADVANCED WRITTEN COMMUNICATIONS** (6 Hours)
- (Satisfies University English II & Communications Requirement)
- ENGL 2700 – Tech Writing (satisfies 2nd English)
- ENGR 2060 - Prof. Presentations, (satisfies UNT communications)



BASIC REQUIREMENTS

- English (3 hours)
- History (6 hours)
- Political Science (6 hours)
- Humanities (3 hours)
- Social and Behavioral Science (3 hours)
- Visual and Performing Arts (3 hours)
- Understanding the Human Community (3 hours)





How the customer explained it



How the Project Leader understood it



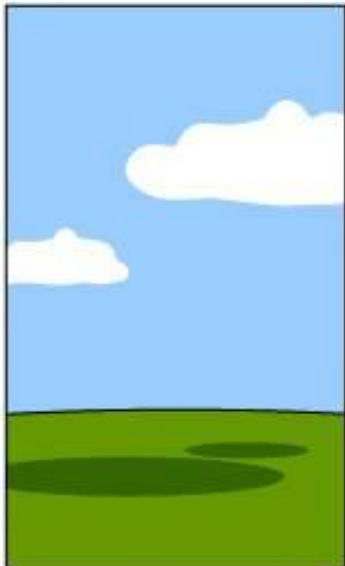
How the Analyst designed it



How the Programmer wrote it



How the Business Consultant described it



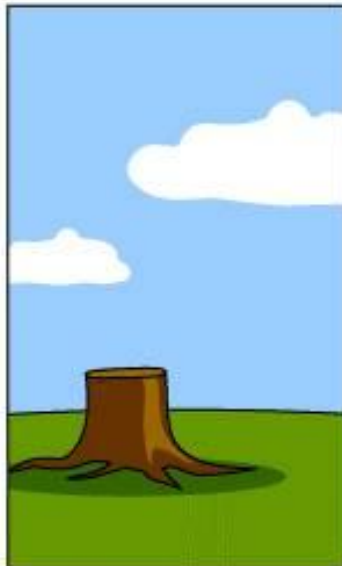
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

THE IT REQUIREMENTS

○ Required Courses

- CSCE 1030 – Computer Science I (4 hrs)–COSC 1436
- CSCE 1035 – Information Systems I (3 hrs)
- CSCE 1045 – Information System II (3 hrs)
- CSCE 1040 – Computer Science II (3 hrs)–COSC 1437
- CSCE 2050 – Computer Science III (3 hrs)-COSC 2436
- CSCE 2615 – Ent. Architecture/Design (3 hrs)
- CSCE 3055 – IT Project Mgmt (3 hrs)
- CSCE 4355 – Database/Info. Int.(3 hrs)
- CSCE 3535 – Network/Sec. Mgmt (3 hrs)
- CSCE 3605 – IT Systems / Admin.(3 hrs)
- CSCE 4905 – Capstone I (3 hrs)
- CSCE 4925 – Capstone II (3 hrs)
- CSCE 4010 – Engineering Ethics (2 hrs)




THE EARLY PROJECT

- CSCE 1035 Information Systems I
 - This course provides introduction to the design of medium to large scale enterprise information systems and distributed systems using either the Microsoft .NET or LAMP framework. The course will introduce tools and techniques for building such systems and will incorporate project-based learning as students work in teams to apply their knowledge in a semester-long development activity.
- CSCE 1045 Information Systems II
 - This course will continue the concepts introduced in Information Systems I with introduction of active content, data-driven content and service-oriented architectures. Students will again be organized in teams in order to complete a large scale development activity using the knowledge and tools presented in the course.



DESIGN AND MANAGEMENT

- CSCE 2615 Enterprise Systems Architecture and Design
 - This course provides an overview of both software architectures for information systems starting with requirements and proceeding through the analysis and design aspects of the software development lifecycle. Students will be introduced to UML, patterns, a variety of implementation methodologies as well as alternate architectural paradigms such as Web Services, Service Oriented Architectures, etc. Laboratory and project activities will expose students to the design and specification of IT Systems to meet a variety of business and technical problem environments.
 - CSCE 3055 IT Project Management
 - This course provides students with the tools and techniques needed to manage a wide variety of IT Systems projects, including software design and development, IT Systems design and installation, network management and support and others. Students will develop and practice skills through the use of case studies and other project-based exercises.
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SKILL VARIETY

- **CSCE 4355 – Database Design and Information Integration**
 - This course will introduce students to use of database systems and other information storage and retrieval techniques in the design and development of information-driven systems. Students will gain experience in the design, development and use of databases, information storage, search and retrieval systems and the associated tools. Students will also integrate information and database components with additional software components to create data-driven applications.
- **CSCE 3535 Introduction to Network and Security Management**
 - This course will introduce students to basic concepts in synchronous and asynchronous data communications, network architectures, protocols and current technology. It will also address basic network and information security issues and protection schemes with laboratory exercises designed to expose students to a variety of network architectures, security threats and risk mitigation strategies.
- **CSCE 3605 IT Systems and Administration**
 - This course will prepare students with an understanding of operating systems structure and operation including the concepts of processes, resource and file management and performance. Students will also develop an understanding of operating system design, systems software and maintenance, as well as gain proficiency in the development of useful scripts, device drivers and utility programs written in high level languages and native scripting environments.



CAPSTONE

○ **CSCE 4905 Capstone I and 4925 Capstone II**

- This a two course sequence in which students will develop an complex IT System starting from customer requirements and progressing through the entire analysis, design, implementation, testing and delivery lifecycle. Students will work in teams to develop a project plan, complete the technical components of the project, prepare a variety of deliverable documents, and finally deliver the finished product to the customer.
- The first course will focus on the analysis and design of the system, while the second course will focus on the implementation, testing and delivery of the system.



SOCIAL RESPONSIBILITY

- CSCE 4010 Engineering Ethics
 - This course addresses the effects of technology in modern society with an emphasis on the role of engineering and technology professionals in assessing, communicating and controlling those effects in an effective and efficient manner. Students will investigate social impact of technology through case studies and research assignments.



TRANSFERABLE HOURS

- A total of up to 83 hours could be earned at the community college
- Typical transferable hours is about 30 -40 hours
- With some work to revise required course sequences and degree plans, and tailored articulation agreements – more students could transfer more hours into the program
- This is one of our working goals for the next 2 years



OTHER FEATURES

- Multi-Campus
 - Offered in Denton and Dallas
 - New faculty member full-time in Dallas
- Enrollment
 - Approximately 40 students enrolled so far including at least 2 from the CTC
- Future Plans
 - Partner with local community colleges to integrate 1000 and 2000 level courses into their curriculum as well to provide a more seamless transition
 - Establish customized degree plans and articulation agreements with selected community colleges
 - Forge alliances with other departments and institutions to create additional specialization opportunities.
 - Mentor other 4 year schools in cooperation with 2 year convergence programs



SMOOTH TRANSITION

- With this new program, you can smoothly transition from the community college
- Accepts up to 18 hours of technology classes, including
 - Convergence
 - Networking
 - Security
 - Web design
 - Customer service and support
 - Graphics design or gaming
 - And many others!



A PHILOSOPHICAL NOTE

- “Life is a coin. You can spend it any way you wish, but you can only spend it once”
 - unknown
- We would like you to be able to spend it “exactly” the way you want!

