Our first Totally Online B.S. Program

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Macon State College has proposed a new totally-online Bachelor degree program in Information Assurance. This will be our first totally-online Bachelor's degree program. We propose to present this new degree, why we are establishing this, what markets conditions favor this program, etc.

This is in response to the nationwide drop in IT enrollment.

Background

It is clear that there is a perception among many young people that technology is not a reliable field to enter in terms of landing suitable employment. How do we know this? Decline in IT programs nationwide are in a period of decline. And, this problem is apparently quite real. CS, SE, and IS enrollments are down drastically, and some educational institutions have talked about either closing IT down or merging it into some other academic discipline.

The reasons for this are many, but prevailing in studies on this issue is the psychological impact from the IT (e.g. dot com") bubble bursting in 2001.

Specifically, we at Macon State College have suffered a 14% decline in IT enrollment since 2001. In order to address this decline, the Division of Information Technology is pursuing several efforts as follows:

1. The College has recruited a hard-charging and dynamic Chair who has a superb record in recruiting students in this field as well as solid and highly-respected managerial accomplishments.

2. Efforts have been underway to seek ABET accreditation. ABET accreditation is assurance that a college or university program meets the quality standards established by the profession for which it prepares its students. For example, an accredited engineering program must meet the quality standards set by the engineering profession. An accredited computer science program must meet the quality standards set by the computing profession.

3. Internal retention efforts are underway, namely we are attempting to educate our current student base that there are indeed employment opportunities in the information technology arena nearby, contrary to what they may believe. It should be noted that the off shoring efforts being seen in many locations are not reflected by the local employers).

4. Curriculum review is undergoing to assure our curriculum and its individual emphases and even courses are relevant to our local employer base. This employer base primarily consists

of information technology positions at Robins Air Force Base, the third largest USAF base, educational institutions nearby (the local k-12cschool systems), IKON, GEICO as well as others, including smaller mom-and-pop operations.

5. Accelerating out efforts in placing interns out into the local community. We have discovered that many of these interns end up being hire, full-time, at their intern locations once they have graduated with their degree.

6. Cementing more effective partnerships with local businesses including the possible resurrection of a business liaison council.

7. Introduction of an entirely new online Bachelor of Science in Information Assurance degree.

It is this latter item, e.g. "reason", this brief is directed.

The Process

The Division of Information Technology at Macon State College conducted informal interviews with community leaders such as local government and business leaders. This process was initiated in order to ascertain whether there are areas of interest that out current Bachelor of Science in Information Technology degree does not adequately address. Again, this approach was pursued so as to hopefully find a way to increase enrollment. The result of these interviews was that the area of Security/Information Assurance is not adequately represented in our current academic offerings.

This offering should be highly desirable in light of the many businesses needing secure systems as well as enhanced security concerns at Robins Air Force Base. Robins Air Force Base is the home of Warner Robins Air Logistics Center, the 78th Air Base Wing, and more than 60 other units that make up a vital part of the Air Force war fighting team. It is the largest industrial complex in Georgia, employing a work force of over 25,584 civilian, contractor, and military members. Robins Air Force Base has an annual net payroll of $1,239 million, annual expenditures of $265 million, and a retiree payroll of $491 million. Using a standard Air Force formula places the annual value of indirect jobs created at $836 million for a total economic impact of $2.8 billion in FY05.

In the past, the Middle Georgia RDC utilized a region specific model that considered variables unique to each installation, including among others:

1. The base's mission,
2. The diversity of the economy in the surrounding communities,
3. and the size of the local population.

Averaging the 2004 RDC furnished factor of 2.364 with previous year's analysis places the value of indirect jobs created at $2.2 billion in
FY05. This leads to an estimated total economic impact of $4.2 billion in FY05, as shown below.

Net Payroll
$1,238.5 million

Retiree Payroll
$490.9 million

Annual base expenditures in Ga
$265.6 million
Annual value of indirect jobs created
$2,162.6 million

Total Economic Impact in Ga
$4,157.6 million

In addition to the increased emphasis on Security/Information Assurance at Robins Air Force Base, we also get many of requests for a fully online program. These requests come from local business leaders and our current student base. As one evidence of the pent-up demand for online course offerings, the Division has had several instances within the past two years where a class will not have sufficient enrollment and so we are forced to not "make" it, e.g. not offer it. However, as a test case, some time ago we began offering to offer that course online. In every case studied, the course enrollment soared almost overnight. As only one example, we offered a Linux Systems Administration course a year ago and only four students initially enrolled. After an email to all IT students indicating it would be shifted to a totally online class, enrollment increased in three days form four to fourteen.

We have already obtained permission form the Vice President of Academic Affairs to offer this program. Next, the new program must be approved by the entire Academic Council. This decision is imminent. Finally, it must be approved by the Board of Regents of the University System of Georgia. Where are we at this point in time? We are in the final stages of crafting the program. The projected program is shown below (subject to change). It should be noted that students must first take out "standard" junior-level classes before they are eligible to enroll in the courses listed below:

ITEC 4205 Legal Issues in Information Technology (3)

> Old catalog description: This course provides the opportunity for IT majors to learn about the legal, regulatory, and ethical issues involved in the field of information technology. The legal concepts and laws that govern computers and technology will be studied. Topics include ethics, security, privacy, current legal issues. *PREREQ:* At least a C in ITEC 2215
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> 1. Introduction to Cyberethics: Concepts, Perspectives, and Methodological Frameworks.
> 2. Ethical Concepts and Ethical Theory: Establishing and Justifying A Moral System.
> 3. Critical Thinking Skills and Logical Arguments: Tools For Evaluating Cyberethics Issues.
> 4. Professional Ethics, Codes of Conduct, and Moral Responsibility.

5. Privacy and Cyberspace.
6. Security in Cyberspace.
7. Cybercrime and Cyberrelated Crimes.
8. Intellectual Property Disputes in Cyberspace.
9. Regulating Commerce and Speech in Cyberspace.
10. Social Inclusion, the Digital Divide, and the Transformation of Work: The Impact for Class, Race and Gender.
11. Community and Identity in Cyberspace: Ethical Aspects of Virtual-Reality and Artificial-Intelligence Technologies.
12. Pervasive Computing and Converging Technologies: Ethical Aspects of Ambient Intelligence, Bioinformatics, and Nanocomputing.

ITEC 4321 Computer Forensics

This course offers a disciplined approach to implementing a comprehensive accident-response plan with a focus on being able to detect intruders, discover what damage they have caused, and discover their identities.
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ITEC 4285 Web Server Administration

This course covers installation, configuration, and administration of Web servers and services; focus on Windows-based network operating systems running Internet Information Services (IIS) and Apache Web Services; setting up, securing, and managing services including hypertext transfer protocol (HTTP), file transfer protocol (FTP), and simple mail transport protocol (SMTP); extensive hands-on work in a network laboratory.

ITEC 429B5 Network Security

Book: *Counter Hack Reloaded: A Step-by-Step Guide to Computer Attacks and Effective Defenses,* 2/E

Explores the products, people, and processes that implement the Network Security Monitoring (NSM) model. By focusing on case studies and the application of open source tools, the student will gain hands-on knowledge of how to better defend networks and how to mitigate damage from security incidents.

- The NSM operational framework and deployment considerations.
- How to use a variety of open-source tools—including Sguil, Argus, and Ethereal—to mine network traffic for full content, session, statistical, and alert data.

- Best practices for conducting emergency NSM in an incident response scenario, evaluating monitoring vendors, and deploying an NSM architecture.
- Developing and applying knowledge of weapons, tactics, telecommunications, system administration, scripting, and programming for NSM.
- The best tools for generating arbitrary packets, exploiting flaws, manipulating traffic, and conducting reconnaissance.

ITEC 42XX Database Security and Disaster Recovery

Possible books: *Implementing Database Security and Auditing: Includes Examples for Oracle, SQL Server, DB2 UDB, Sybase* and (*Disaster Recovery Planning: Strategies for Protecting Critical Information Assets* or *Disaster Recovery: Principles and Practices*)*:*

The student will learn many methods and techniques that will be helpful in securing, monitoring and auditing database environments. It covers diverse topics that include all aspects of database security and auditing - including network security for databases, authentication and authorization issues, links and replication, database Trojans, etc. The student will also learn of vulnerabilities and attacks that exist within various database environments or that have been used to attack databases (and that have since been fixed).

The student will also learn about an extensive introduction to disaster recovery focusing on planning the team, planning for the disaster and practicing the plan to make sure that, if ever needed, *it will work.*

Chapter 1: Introduction to Disaster Recovery
Chapter 2: Preparing to Develop the Disaster Recovery Plan
Chapter 3: Assessing Impact and Risks in the Enterprise
Chapter 4: Prioritizing Systems and Functions for Recovery
Chapter 5: Identifying Data Storage and Recovery Sites
Chapter 6: Developing Plans and Procedures, and Relationships
Chapter 7: Developing Procedures for Special Circumstances
Chapter 8: Testing the Disaster Recovery Plan
Chapter 9: Continued Assessment of Needs, Threats, and Solutions
Appendix A: Disaster Recovery Plan
Appendix B: Checklist Sample Testing Documents

Take either

ITEC 42XX Software Security

Possible books: *Software Security: Building Security In* or *19 Deadly Sins of Software Security*.
Prerequisite: ITEC 3310. Covers:

Eliminate these security flaws from computer code:

- Buffer overruns
- Format string problems
- Integer overflows
- SQL injection
- Command injection
- Failure to handle errors
- Cross-site scripting
- Failure to protect network traffic

- Use of magic URLs and hidden forms
- Improper use of SSL
- Use of weak password-based systems
- Failure to store and protect data securely
- Information leakage
- Trusting network address resolution
- Improper file access
- Race conditions
- Unauthenticated key exchange
- Failure to use cryptographically strong random numbers
- Poor usability

Or

ITEC Wireless Network Security

Possible book: *Security In Wireless LANS And MANS* or *CWNA Certified Wireless Network Administrator Official Study Guide (Exam PW0-100), Third Edition*

Key foundation topics and technology frameworks for designing and maintaining secure, reliable operations. Covers basic concepts to designing principles to deployment, and coverage of wireless security testing techniques and intrusion prevention techniques. Identify various vulnerabilities in the physical layer, the MAC layer, the IP layer, the transport layer, and the application layer, and discuss ways to strengthen security mechanisms and services in all these layers. The topics covered include intrusion detection, secure PHY/MAC/routing protocols, attacks and prevention, immunization, key management, secure group communications/ multicast, secure location services, monitoring and surveillance, anonymity, privacy, trust establishment/management, redundancy and security, and dependable wireless networking.

Conclusion

Our preliminary data shows that this new program should bring new students into our Division of Information Technology. This has obvious benefits from increased opportunities for faculty to teach varied classes, students becoming more knowledgeable in a skill area desirable to out local employment market, and, finally, employers being in the unique position of obtaining qualified students in this highly-desirable knowledge area.