

## **Certificate of Graduate Study (COGS) in Networks**

This certificate is intended for computer scientists or engineers who wish to make themselves more marketable in the workplace. These students may be recent graduates of a bachelor's program, or they may be more senior computing professionals wishing to update their skills with the newest technologies.

### **Major goals of the program**

This COGS is designed for the student who already has a background in computer science or computer engineering but relatively little training in networks. The COGS is designed for students to understand the Internet, network organization, major network protocols and the principles behind them, wireless networks, network security, and the simulation and performance of network applications.

### **Specific objectives of the program**

After completing the COGS in Networks, students will:

1. Understand the tasks that typical networks accomplish and how they are implemented in the Internet
2. Understand major network protocols and the principles behind them
3. Understand major wireless network technologies, protocols, and applications
4. Understand important network security issues, standards and solutions
5. Be able to use simulation tools to study the performance of network systems

### **Structure of the program**

Students will be required to complete four courses (total of 12 s.h.) for the COGS in Networks:

Computer Networks (CS 06510) – 3s.h.

Wireless Networks and Systems (CS 06505) – 3s.h.

Advanced TCP/IP and Internet Protocols and Technologies (CS 07575) – 3s.h.

Network Security (HEGIS number to be announced) – 3s.h.

# **Certificate of Graduate Study (COGS) in Software Engineering**

This certificate is intended for computer scientists or computer engineers who wish to update their skills and make themselves more marketable in the workplace. These students may be recent graduates from a computer science or computer engineering program, or they may more senior computing professionals wishing to keep current in their field by learning the newest technologies.

## **Major goals of the program**

This COGS is designed for the student who already has a background in Computer Science or Computer Engineering but relatively little experience in full software development lifecycle. The COGS is designed for students to understand the development of safety-critical and real-time software systems, software project management, object-oriented software design, advanced programming languages paradigms, and human factors engineering, and it prepares them to work as technical writers, requirements engineers, designers, architects, quality assurance engineers, project managers, and technical team leaders in software development.

## **Specific objectives of the program**

After completing the COGS in Software Engineering, students will be able to:

1. Work as professionals in the areas of requirements, design, development, implementation, testing, and maintenance of computer systems and software applications.
2. Manage software development projects.
3. Write technical documentation related to software projects.
4. Integrate software applications into existing environments.
5. Select appropriate programming languages based on the required qualities of software systems.

## **Structure of the program**

Students will be required to complete four courses (total 12 sh) for the Software Engineering COGS:

*Advanced Software Engineering* (CS 07.523) -- 3 s.h.

*Advanced Object Oriented Design* (CS 04.570) -- 3 s.h.

*Programming Languages: Theory, Implementation, and Application* (CS 04.548) -- 3 s.h.

*Information Visualization* (CS 07.570) -- 3 s.h.

All four courses are existing graduate courses.

## **Certificate of Graduate Study (COGS) in Web Development**

This certificate is intended for computer scientists who wish to update their skills and make themselves more marketable in the workplace. These students may be recent graduates from a computer science program, or they may be older computer science professionals wishing to keep current in their field by learning the newest technologies.

### **Major goals of the program**

This COGS is designed for the student who already has a background in software development but relatively little experience in web site development. The COGS is designed to teach the student the skills in web programming, database design, networks, and user interface design that are necessary to the creation of a good dynamic web site.

### **Specific objectives of the program**

After completing the COGS in Web Development, students will be able to:

1. Create web sites with good user interfaces that allow users to access information quickly and easily.
2. Create dynamically updated web sites which present up-to-the-minute information from a variety of sources, including databases, other servers, and on-the-fly calculations.
3. Create well-structured databases.
4. Understand the principles of computer networks that enable the World Wide Web to function.

### **Structure of the program**

Students will be required to complete four courses (total 12 sh) for the Web Development COGS:

*Advanced Web Programming* (CS 04.505) -- 3 s.h.

*Advanced Database Systems: Theory and Programming* (CS 04.530) -- 3 s.h.

*Advanced Software Engineering* (CS 04.510) -- 3 s.h.

*Computer Networks* (CS 06.510) -- 3 s.h.