Descriptions, skills and software by course

**IS 101 — Planning For Information Technology Students** (1 cr)

Current catalog description:

Three main objectives comprise this course. First, inform students of options, outcomes and consequences of information technology education and training programs. Second, lead students in determining their education/training objectives and developing goals. Finally, prepare specific plans for subsequent education/training. Although concentration on information technology programs at SFCC, other programs are evaluated to determine which are most effective for each student. Students participate in group projects, documenting their research in written and oral reports. Upon completion of the course, students possess a detailed training/education plan. Prerequisite: Concurrent enrollment in IS 102.

Current Learning Outcomes:

1. Students evaluate the diverse job opportunities related to Information Technology. 2. Students develop and maintain a precise documentation of career research, opportunities, education and training requirements.

Current Pre-Requisites:

Concurrent Enrollment in IS102

Skills – Degree, College and Resource Awareness

Software – N/A

**IS 102 — IS and Cybersecurity Careers** (2 cr)

Current catalog description:

In this course students learn about IS and Cybersecurity careers and the requirements to start or advance in these career fields. This course focuses on identifying current career paths, required skills and industry requirements for entry-level through advance career jobs. Prerequisite: Concurrent enrollment in IS 101.

Current Learning Outcomes:

1. Define common IT career paths and skills needed to start and progress in chosen paths 2. Define common Cybersecurity career paths and skills needed to start and progress in chosen paths 3. List skills and industry certifications needed to work in IT and Cybersecurity careers 4. List skills and industry requirements for entry level IT or Cybersecurity jobs 5. Select career paths that they wish to pursue 6. Explain the skills and industry expectations to start and progress in selected career paths 7. Describe the difference between IT and Cybersecurity career paths

Current Pre-Requisites:

Concurrent Enrollment in IS101

Skills – Career Examination

Software – N/A

**IS 103 — Information Technology Fundamentals** (5 cr)

Current catalog description:

Students learn computing hardware, operating systems and software applications. They learn to perform daily computer operations, including setting up a computer and installing new software. Skills are developed to evaluate and select business computer software and hardware and discuss and compare common operating systems. Hardware management and network terminology are introduced and selected operating systems are available for the students to experience.

Current Learning Outcomes:

1. Explain principal differences in various operating systems 2. Identify computer systems technical specifications 3. Assemble, disassemble, and configure a computer system

Current Pre-Requisites:

None

Skills – Hardware Fundamentals, Operating System Fundamentals, Windows Fundamentals

Software – Windows 10

**IS 106 — Fundamental IT Applications** (5 cr)

Current catalog description:

In this course students will learn fundamentals of information technology related applications available and used in all major industries. They work on their knowledge of word processing, spreadsheets, databases, and collaborative applications. Students will use common office suites, such as Microsoft Office. Areas of emphasis will include advanced use of included features, identifying the most suitable application for common business functions and project-based learning.

Current Learning Outcomes:

1. Summarize the uses of common IT applications.

2. Identify most appropriate application by type of business task.

3. Apply specific functions and actions within specific applications.

4. Create new projects or documents appropriate to specific business task.

5. Summarize features of individual applications.

Current Pre-Requisites:

None

Skills – Office Suite Basic Use

Software – Outlook, Word, Excel, Access, OneNote

**IS 125 — Linux and Python Fundamentals** (5 cr)

Current catalog description:

In this course students will learn about the fundamentals of the Linux operating system and the Python programming language. Students will be introduced to the basics of programming concepts using Python while immersed in the Linux environment. They will learn the key components of Linux as used in IT and cybersecurity fields. This will include command-line navigation and administrative concepts of servers.

Current Learning Outcomes:

1. Demonstrate proficiency in using Python to write simple linear or looping scripts.

2. Generate secure, robust Python scripts with compound conditions to solve complex problems.

3. Configure Linux OS including installing updates, software from repositories and creating user accounts with appropriate permissions.

4. Navigate and perform basic operations on a Linux computer using the command-line interface including remote access with SSH.

5. Compile binaries from source code.

Current Pre-Requisites:

No hard pre-requisites, recommended IS210 (not in CTClink or description?)

Skills – Linux familiarity, CLI fundamentals, shell scripting, Python scripting

Software – Linux, Python

**IS 132 — Computer Ethics and Law** (5 cr)

Current catalog description:

This class will address basic cyberspace legal issues and policy problems. Specific problems in applying law to cyberspace in areas such as intellectual property, privacy, computer crime, and the bounds of jurisdiction will be explored.

Current Learning Outcomes:

1. Students identify and analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professional.

2. Students locate and apply case law and common law to current legal dilemmas in the technology field.

3. Students apply diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions.

4. Students distinguish enforceable contracts from non-enforceable contracts.

5. Students demonstrate leadership and teamwork.

Current Pre-Requisites:

None

Skills – Familiarity with legal and ethical concerns in a corporate computing environment

Software – N/A

**IS 141 — Cyber Defender 1** (5 cr)

Current catalog description:

In this course students will apply their knowledge of networking, Linux and Windows operating systems, the Internet, Web services and log management. This course is a hands-on mentor led learning course with optimized lecture and instruction. Students in this course should be able to work without precise specific direction, instruction or supervision. Tasks and objectives are provided along with general guidance and tools to accomplish the required outcomes. Prerequisite: IS 125 and IS 165.

Current Learning Outcomes:

1. Explain common hacker attack methods

2. Differentiate between legitimate and malicious network traffic

3. Illustrate the functionality of an exploit kit

4. Investigate malicious software

5. Locate malicious content in network traffic

6. Effectively operate password recovery software

Current Pre-Requisites:

IS125 and IS165

Skills – SOC Analyst Fundamentals, SIEM, IDS, Packet Capture Analysis

Software – Snort, Splunk, Wireshark

**IS 165 — Networking Fundamentals** (5 cr)

Current catalog description:

In this course students will learn data and communication networking fundamentals. This includes topics such as hardware, protocols, topologies, OSI models, network services and network applications. Students will apply foundational concepts by examining sample or live network traffic.

Current Learning Outcomes:

1. Describe the fundamental technologies, components of a communication and data network.

2. Design a basic network architecture given a basic scenario.

3. Use a network monitoring tool to observe, identify and track simple TCP/IP packets.

4. Perform a basic network mapping.

5. Describe common network vulnerabilities.

Current Pre-Requisites:

None

OSI, TCP/IP, routing, switching

Software – Packet Trace, Wireshark

**IS 210 — Internet Programming I** (1-5 cr)

Current catalog description:

Students create web pages using XHTML and other scripting languages. Experience is gained in designing and structuring effective and accessible web pages, including pages with tables, forms and frames. Students format pages using cascading style sheets and advanced concepts, including Applets, Flash, XML and JavaScript for XHTML documents. Credits are determined by the successful completion of modules as required by the program or personal learning goals. This course may be repeated up to a maximum of 5 credits.

Current Learning Outcomes:

1. Structure valid Web pages using HyperText Markup Language (HTML) and XHTML

2. Format Web pages using Cascading Style Sheets (CSS)

3. Design usable Web pages and Web sites

4. Code Web pages that are accessible to a diverse, global audience

5. Organize and manage complex Web sites

6. Insert images, hyperlinks, and image maps into a Web page

7. Layout well–designed pages using HTML tables and frames

8. Create HTML forms

9. Incorporate multimedia and JavaScript to provide dynamic Web pages

Current Pre-Requisites:

None

Skills – HTML, CSS, JavaScript, ODBC

Software – Python, JavaScript, MySQL

**IS 228 — Internet Servers** (5 cr)

Current catalog description:

This course provides an overview of services installed on an Internet server. Email servers, web servers, database servers will be installed, configured, secured and managed on multiple platforms. Prerequisite: IS 262.

Current Learning Outcomes:

1. Students will learn to work cooperatively with their clients and communicate research needs and propose solutions.

2. Students will install internet servers and troubleshoot installation related problems.

3. Students will maintain internet secure servers in real world environments.

4. Students will install a database service and configure it.

Current Pre-Requisites:

Skills – Sharepoint configuration, Web App Publication,

Software – Moodle, MyCloud, Sharepoint,

**IS 234 — Computer Forensics I** (5 cr)

Current catalog description:

Students learn to provide a secure computer environment and learn techniques for collecting and analyzing computer-related evidence. This class is designed to train computer technicians in the elements of computer forensics investigation. Prerequisite: IS 132 or permission of instructor.

Current Learning Outcomes:

1. Analysis/Problem Solving and information literacy:

a. Students evaluate a problem as being a possible case.

b. Students develop a forensic case using the industry-approved methodology.

c. Students develop and maintain a precise journal / log.

2. Communications

a. Students collect information from investigated person and/or client.

b. Students formulate a complete and adequate process plan and measure against it.

c. Students present their conclusion to the rest of the class.

3 Responsibility: Students are responsible for own work

Current Pre-Requisites:

IS103 (IS132 is listed in description but not enforced?)

Skills – Digital Forensic Fundamentals, Evidence Handling, Data Carving

Software – FTK Imager, Autopsy, Fred

**IS 241 — Cyber Defender 2** (5 cr)

Current catalog description:

In this course students will expand their applied knowledge of network traffic and packets, malware, memory and drive forensics. This course is a hands-on mentor led learning course with optimized lecture and instruction. Students in this course should be able to work without precise specific direction, instruction or supervision. Tasks and objectives are provided along with general guidance and tools to accomplish the required outcomes. Prerequisite: IS 141.

Current Learning Outcomes:

1. Analyze computer memory

2. Identify suspicious activities or software using forensic software

3. Write a technical analysis of a computer compromise

4. Demonstrate the ability to locate information using open source intelligence

5. Illustrate a timeline of a computer compromise

6. Operate network traffic analysis software

Current Pre-Requisites:

IS141

Skills – Digital Memory Forensics, Computer Forensics, Incident Response

Software – Volatility, Autopsy

**IS 243 — Malware Analysis and Exploitation** (10 cr)

Current catalog description:

In this course students will apply their knowledge of malware, vulnerabilities, exploitation and hacker strategies. This course is a hands-on mentor led learning course with optimized lecture and instruction. Students in this course should be able to work without precise specific direction, instruction or supervision. Tasks and objectives are provided along with general guidance and tools to accomplish the required outcomes. Prerequisite: IS 241.

Current Learning Outcomes:

1. Analyze executable files

2. Conduct open source intelligence

3. Execute a SQL injection attack

4. Develop shellcode exploits

5. Deploy social engineering attacks

6. Illustrate a successful computer hack and exfiltration of data

7. Explain advanced hacker methodologies

Current Pre-Requisites:

IS241

Skills – Malware Analysis, Social Engineering, Penetration Testing

Software - ??????

**IS 244 — Network Security I** (5 cr)

Current catalog description:

Network Security focuses on the fundamental principles of computer and network security. It is a survey of security fundamentals, networks threats, network operating systems security features, firewalls, virtual private networks, encryption and intrusion detection.

Current Learning Outcomes:

1. Analysis/Problem Solving and information literacy:

a. Students develop a secure computer network plan.

b. Students evaluate and recognize a problem as being a possible network security threat.

c. Students need to understand the security issues involved with different Network operating systems.

2. Communications

a. Students collect information from Computer network logs.

b. Students formulate a complete and adequate counter measure plan and prepare against it.

c. Students present their findings to the rest of the class.

3 Responsibility: Students are responsible for their own work.

Current Pre-Requisites:

IS103, IS262

Skills – Confidentiality, Integrity, Availability, Risk Management Fundamentals, Vulnerability and Exploitation Concepts

Software – Kali Linux, Metasploit Framework using Armatage, Nessus, Nmap

**IS 245 — Network Security II** (5 cr)

Current catalog description:

This course is an introduction to the development of Network Systems defense and countermeasures. Students learn the steps utilized to respond to techniques used to compromise networks. It specifically leads students through the process of learning the foundations of network security, firewall implementation and intrusion detection. Prerequisite: IS 244 or permission of instructor.

Current Learning Outcomes:

1. Analysis/Problem Solving and information literacy:

a. Students develop a secure network defense plan.

b. Students evaluate and recognize a problem as being a possible network security threat.

c. Students need to understand the security issues involved with different firewall and intrusion detection technologies.

2. Communications

a. Students collect information from firewall Devices logs.

b. Students formulate a complete and adequate counter measure plan and prepare against it.

c. Students present their findings to the rest of the class.

3 Responsibility: Students are responsible for their own work.

Current Pre-Requisites:

IS245

Skills – Incident Response, Event Tracking, IDS/IPS, SIEM

Software – Kibana, ELK Stack, Mantis Bug Tracker

**IS 260 — Database Theory** (5 cr)

Current catalog description:

This course serves as a foundation for working with all types of databases. It reviews what a database is and moves into the various database models such as hierarchical, network, relational, entity and object oriented. It also covers design concepts, SQL, normalization and database administration. Prerequisite: Permission of instructor.

Current Learning Outcomes:

1. Understand the importance of databases in the business environment.

2. Describe and use the five database models.

3. Describe relational databases and SQL.

4. Normalize a database.

5. Understand the causes of splintering and corruption of databases.

6. Describe and design a data warehouse and perform data mining.

Current Pre-Requisites:

IS107 (never adjusted to IS106)

Skills – Database Fundamentals, SQL scripting,

Software - MySQL

**IS 262 — Network Management** (5 cr)

Current catalog description:

This is an intensive course in the technical management of computer networks including servers and workstations. Students, who are expected to understand the principles of telecommunications, will learn to install, manage and maintain a network. Microsoft and Linux are the primary software used. However, other Network Operating Systems (NOS) are installed. This course stresses concepts and practical usage of many types of NOS. Prerequisite: IS 162 or IS 165.

Current Learning Outcomes:

1. Students will demonstrate the industry networking by implementing a network based on these standards.

2. Students will be able to install, configure and maintain a network operating system.

3. Students will demonstrate their abilities in designing a Local Area Network (LAN) according to specific business needs.

Current Pre-Requisites:

IS165

Skills – Active Directory, GPOs, Account Management, Rights, Permissions, Resource Management

Software – Windows Server, Active Directory, DNS, DHCP

**IS 266 — Cooperative Education Seminar** (1-2 cr)

Current catalog description:

For course description, see Cooperative Education

**IS 267 — Cooperative Education Work Experience** (1-18 cr)

Current catalog description:

For course description, see Cooperative Education

**CS 223 — Programming for IT** (5 cr)

Current catalog description:

This course focuses on fundamental principles of programming and scripting and presenting unique visual and object-oriented features. The course allows students to become proficient in scripting and programming, and the principles of good program design. Students write and demonstrate simple structured programs, but with well-developed user interfaces. Programming assignments include procedural techniques and event-driven processing. Prerequisite: IS 125 and IS 210.

Current Learning Outcomes:

1. Apply programming processes within the programming language environment.

2. Apply the basic concepts of object oriented programming, modularity, and structured code.

3. Verify that the results obtained satisfy the original requirements.

4. Think logically and critically to solve problems, explain conclusions and evaluate or critique the thinking of self and others.

Current Pre-Requisites:

IS125

Skills – Fundamental Programming Concepts, Flow Control, Variables

Software - Python