

Information Technology Program

Core Courses

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: A+ Hardware

Total Semester Units: 3.0

Total Hours: 45

Theory/Lecture Hours: 45

Application/Lab Hours: 0

Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to the basics of installing, configuring, maintaining, upgrading, diagnosing, troubleshooting, and networking recent and current personal computer hardware. Students will also learn concepts of computer hardware technology and the terminology that is used across the industry.

Supported Certifications:

CompTIA A+ (note that both the Hardware and Software exams must be passed in order to achieve A+ certification)

Prerequisites: None

Course Learning Outcomes

Upon completion of this course the student will be able to:

1. Explain the primary hardware components of a personal computer.
2. Describe the general tools and processes computer technicians use to repair computer hardware safely.
3. Illustrate the specific ways computer technicians configure, maintain, and replacement computer hardware.
4. Explain ways that professional technicians serve customers well.
5. Explain the steps for troubleshooting computer hardware problems effectively.
6. Apply networking concepts and knowledge of hardware to illustrate how to connect computers to a network and troubleshoot networking problems.
7. Explain the characteristics of portable computing devices and printers.

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Course Outline

Unit Objectives

Unit 1: Overview of Computer Hardware and Repair; Motherboards

Upon completion of this unit of instruction the student will be able to:

- 1.1 List the different types and functionality of form factors, power supplies, and motherboards available in computing devices
- 1.2 Identify types of storage devices, cabling systems, and connectors
- 1.3 Describe different cooling methods and devices
- 1.4 Explain steps that technicians should take to protect themselves and equipment when lifting, working inside, and repairing computers
- 1.5 List the different tools and cleaning solutions that can be used by a technician
- 1.6 Describe the steps for opening, examining, and removing the components of a system safely
- 1.7 Tell how to configure a motherboard using jumpers and setup BIOS
- 1.8 Describe the techniques for maintaining a motherboard
- 1.9 Illustrate how to replace a motherboard

Unit 2: Processors, RAM, and Hard Disk Drives

Upon completion of this unit of instruction the student will be able to:

- 2.1 Describe different memory technologies such as DIMM and RIMM
- 2.2 Explain how a hard drive functions
- 2.3 Identify the types of interface standards for hard drives
- 2.4 Demonstrate how to select and install a processor to match system needs
- 2.5 Explain the appropriate steps involved in upgrading a computer's memory
- 2.6 Describe how to select and install hard drives
- 2.7 Explain how to set up a hardware and software RAID system

Unit 3: Peripheral Devices, Customer Support, and Troubleshooting Hardware

Upon completion of this unit of instruction the student will be able to:

- 3.1 Explain the basic principles for supporting devices using the Windows action center and device manager
- 3.2 Explain how peripheral devices use ports and wireless connections
- 3.3 Illustrate how to install peripheral devices
- 3.4 Describe how to install and configure adapter cards
- 3.5 Explain how to add media devices
- 3.6 Install and configure a video system
- 3.7 List the standards and file systems used by optical drive storage devices
- 3.8 Explain the job roles and responsibilities of a technician
- 3.9 Describe how to interact professionally with users through interviews and meetings

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- 3.10 List the steps for handling difficult customers
- 3.11 Describe how to deal with prohibited content and activity by customers
- 3.12 Explain how thick and thin clients can be used in the enterprise
- 3.13 List the steps for approaching a computer hardware problem
- 3.14 Explain how to troubleshoot electrical power problems
- 3.15 Describe troubleshooting POST before the video is active and error messages during the boot process
- 3.16 Give the different steps for troubleshooting the motherboard, processor, RAM, hard drives, monitors and video systems
- 3.17 Explain how to properly dispose of computer equipment

Unit 4: Networking Concepts and Technologies

Upon completion of this unit of instruction the student will be able to:

- 4.1 Explain networking concepts using OSI and TCP/IP
- 4.2 Describe how IP addresses are assigned and used in a network
- 4.3 Demonstrate how to connect a computer to a wired network, a wireless network, and a cellular data network
- 4.4 List the steps for installing and configuring a multifunction router for an office network
- 4.5 Describe different network types and topologies used for Internet connections
- 4.6 List hardware that is used by local area networks
- 4.7 Explain how to install and configure wired and wireless network adapters, switches, wireless access points, and bridges
- 4.8 Describe how to troubleshoot network cables and connectors
- 4.9 List the troubleshooting tools used by network technicians

Unit 5: Portable Computing Devices and Printers

Upon completion of this unit of instruction the student will be able to:

- 5.1 Identify different types of portable computing devices
- 5.2 List the unique characteristics of portable computing devices
- 5.3 Categorize types of printers according to their features and languages
- 5.4 Explain the special considerations when supporting portable computing devices
- 5.5 Describe how to replace and upgrade internal parts of a portable computing device
- 5.6 Explain how to use Windows to install, share, and manage printers
- 5.7 Install a local or network printer
- 5.8 Manage printer features, add-on devices, and printer queues
- 5.9 List the steps for maintaining, cleaning, and upgrading printers
- 5.10 Troubleshoot printers

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Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:	
Course Name:	A+ Software
Total Semester Units:	3.0
Total Hours:	45
Theory/Lecture Hours:	45
Application/Lab Hours:	0
Externship/Clinical Hours:	0

Course Description:

This course is designed to introduce the student to the basics of installing, configuring, maintaining, upgrading, diagnosing, troubleshooting, and networking using personal computer software. Students will properly configure software for proper security and also support software on mobile devices.

Supported Certifications:

CompTIA A+ (note that both the Software and Hardware exams must be passed in order to achieve A+ certification)

Prerequisites:

A+ Hardware

Course Learning Outcomes

Upon completion of this course the student will be able to:

1. Describe how to obtain help and information in the Windows environment.
2. Illustrate how to install the Windows operating system and user accounts.
3. Explain preventive maintenance and recovery in Windows.
4. Illustrate how to optimize Windows using appropriate administrative tools.
5. Describe how to resolve common problems with Windows, including blue screen errors, memory problems, startup issues, and lost data.
6. Show how to connect Windows computers to a network.
7. Describe techniques that secure desktop computers and mobile devices running Windows against malware and hacking.

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Course Outline

Unit Objectives

Unit 1: Windows Installation

Upon completion of this unit of instruction the student will be able to:

- 1.1 Describe the different features and applications of the Windows operating system
- 1.2 Identify and implement Windows support tools
- 1.3 Explain how Windows provides different message types to users
- 1.4 Use the Windows Help feature to obtain important information
- 1.5 Explain the proper steps for planning a Windows installation
- 1.6 Describe the different editions, versions, and license options of Windows operating systems
- 1.7 List the different Windows installation options
- 1.8 Describe the Windows post-installation options
- 1.9 Demonstrate how to set up user accounts and transfer data
- 1.10 Describe how to implement specific Windows features
- 1.11 Configure User Account Control

Unit 2: Windows Maintenance and Optimization

Upon completion of this unit of instruction the student will be able to:

- 2.1 Describe Windows preventive maintenance features
- 2.2 Illustrate how to clean up a hard disk drive
- 2.3 Explain how to plan for disaster recovery
- 2.4 Show how to perform a Windows backup
- 2.5 List the various techniques for creating partitions
- 2.6 Explain the different regional and language settings
- 2.7 Explain how Windows manages software applications
- 2.8 List the different Windows management tools
- 2.9 Illustrate how to use Windows administrative tools for optimizing the system
- 2.10 Describe the different means for monitoring and managing Windows performance
- 2.11 Explain how to improve Windows performance

Unit 3: Windows Troubleshooting

Upon completion of this unit of instruction the student will be able to:

- 3.1 List the different Windows troubleshooting tools
- 3.2 Describe different troubleshooting strategies
- 3.3 Explain how to diagnose blue screen errors and improper shutdowns
- 3.4 Identify the results of memory diagnostics and System File Checker
- 3.5 Describe how to troubleshoot application errors

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- 3.6 Explain the Windows boot process
- 3.7 Explain how the BIOS controls startup procedures
- 3.8 Describe different Windows tools for solving startup issues
- 3.9 Describe how the Windows Recovery Environment can be used
- 3.10 Illustrate how to recover lost data

Unit 4: Networks and Windows

Upon completion of this unit of instruction the student will be able to:

- 4.1 Explain networking concepts using OSI and TCP/IP
- 4.2 Describe how IP addresses are assigned and used in a network
- 4.3 Illustrate how to connect a computer to a wired network, a wireless network, and a cellular data network
- 4.4 List the steps for installing and configuring a multifunction router for an office network
- 4.5 List the different Windows applications and tools for network connectivity
- 4.6 Explain how to configure and use Remote Desktop
- 4.7 Describe how Group Policy can be used in an enterprise setting
- 4.8 Describe how to restrict access to files and folders
- 4.9 Describe how to map network drives
- 4.10 Explain how to troubleshoot networking issues

Unit 5: Windows Security

Upon completion of this unit of instruction the student will be able to:

- 5.1 Explain the steps for securing a Windows computer or mobile device
- 5.2 Describe the how Windows credentials authenticate users
- 5.3 Explain how to use Windows Bitlocker to encrypt data
- 5.4 List the steps for using antimalware software for securing Windows systems
- 5.5 Identify different types of mobile devices that run Windows
- 5.6 Explain the special considerations involved in supporting mobile devices
- 5.7 Describe the different operating system software used on mobile devices
- 5.8 Explain how to synchronize mobile devices
- 5.9 Illustrate how to troubleshoot Windows problems on mobile devices
- 5.10 Explain how to use virtualization

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Course Outline

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2. Required Reading, Writing, Projects, and Outside of Class Assignments:

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3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline Formatting Template

Division: Technology

Program: Information Technology

Course Number:

Course Name: Security+

Total Semester Units: 3.0

Total Hours: 45

Theory/Lecture Hours: 45

Application/Lab Hours: 0

Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to the basics of enterprise and personal security. Topics to be covered include network security, compliance and operational security, threats and vulnerabilities; application, data and host security, access control and identity management, and cryptography.

Supported Certifications:

CompTIA Security+

Prerequisites:

A+ Hardware, A+ Software

Course Learning Outcomes

Upon completion of this course the student will be able to:

1. Explain on a high level how networks and devices are attacked and can be defended.
2. Describe how malware and social engineering attacks work.
3. Describe how application and networking-based attacks work.
4. Illustrate how to secure a host computer.
5. Analyze how cryptography can be used to secure data.
6. Explain the devices, technologies, designs, and applications involved in securing a network.
7. Describe the defenses needed to secure wireless networks.
8. Describe how to secure mobile devices and apps.
9. Explain the fundamental principles of access control.
10. Explain the risks and mitigation strategies involved in maintaining information strategy.

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Course Outline Formatting Template

Unit Objectives

Unit 1: Introduction to Security and Attacks

Upon completion of this unit of instruction the student will be able to:

- 1.1 Define information security and explain why it is important
- 1.2 Identify the types of attacks that are common today
- 1.3 List the basic steps of an attack
- 1.4 Describe the five basic principles of defense
- 1.5 Define malware
- 1.6 List the different types of malware
- 1.7 Identify payloads of malware
- 1.8 Describe the types of social engineering attacks
- 1.9 Explain physical social engineering attacks
- 1.10 List and explain the different types of server-side web application attacks
- 1.11 Define client-side attacks
- 1.12 Explain how overflow attacks work
- 1.13 List different types of networking-based attacks

Unit 2: Securing Host Computers and Using Cryptography

Upon completion of this unit of instruction the student will be able to:

- 2.1 List the steps for securing a host computer
- 2.2 Define application security
- 2.3 Explain how to secure data
- 2.4 Install and configure software to secure a host computer
- 2.5 Define cryptography
- 2.6 Describe hash, symmetric, and asymmetric cryptographic algorithms
- 2.7 List the various ways in which cryptography is used
- 2.8 Configure cryptographic software to protect data
- 2.9 Define digital certificates
- 2.10 List the various types of digital certificates and how they are used
- 2.11 Describe the components of Public Key Infrastructure (PKI)
- 2.12 List the tasks associated with key management

Unit 3: Securing a Network

Upon completion of this unit of instruction the student will be able to:

- 3.1 List the different types of network security devices and how they can be used
- 3.2 Explain how network technologies can enhance security
- 3.3 Describe secure network design elements
- 3.4 List and describe the functions of common network protocols
- 3.5 Explain how network administration principles can be applied
- 3.6 Define different network applications and how they can be secured
- 3.7 Describe the different types of wireless network attacks

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Course Outline Formatting Template

- 3.8 List the vulnerabilities in IEEE 802.11 security
- 3.9 Explain the solutions for securing a wireless network
- 3.10 Configure wireless devices for optimum security

Unit 4: Mobile Devices, Access Control, and Account Management
Upon completion of this unit of instruction the student will be able to:

- 4.1 List and compare the different types of mobile devices
- 4.2 Explain the risks associated with mobile devices
- 4.3 List ways to secure a mobile device
- 4.4 Explain how to apply mobile device app security
- 4.5 Define access control and list the four access control models
- 4.6 Describe how to implement access control
- 4.7 Explain the different types of authentication services
- 4.8 Describe the different types of authentication credentials
- 4.9 Explain what single sign-on can do
- 4.10 List the account management procedures for securing passwords

Unit 5: Ensuring Business Continuity
Upon completion of this unit of instruction the student will be able to:

- 5.1 Define business continuity
- 5.2 List the features of a disaster recovery plan
- 5.3 Explain different environmental controls
- 5.4 Describe forensics and incident response procedures
- 5.5 Explain how to control risk
- 5.6 List the ways in which security policies, awareness, and training can provide increased security
- 5.7 Explain the nature and importance of vulnerability assessment
- 5.8 Explain the differences between vulnerability scanning and penetration testing
- 5.9 Describe the security implications of integration with third parties
- 5.10 List techniques for mitigating and deterring attacks

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Course Outline Formatting Template

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health and Technology Studies
Program: Information Technology

Course Number: Course Code
Course Name: Computer Literacy & Applications for the Professional
Total Semester Units: 3.0
Total Hours: 60
Theory/Lecture Hours: 30
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course provides an introduction to computer concepts with Word and Excel processing through hands-on operation. Topics include information on basic computer technology, file management, creation and execution of documents and spreadsheets and e-mail. Computer activities include Internet research and the creation of various documents and reports.

Prerequisites:

None

Textbooks:

See Approved Textbook List

Student Learning Outcomes:

Upon completion of this course, the student will be able to:

1. Explain concepts and use basic features of computer systems, the Internet, and e-mail
2. Identify and understand basic functions of the computer
3. Select and successfully navigate through software to accomplish specific basic tasks found in professional environments
4. Explain the use and benefits of virus protection software
5. Create, edit, and format documents using basic Excel and Word processing skills

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Course Outline

Unit Objectives:

Unit 1: Computers, Internet and E-mail

Upon completion of this unit of instruction the student will be able to:

- 1.1 Identify various types of computer software
- 1.2 Identify basic Internet features and terminology
- 1.3 Connect to the internet
- 1.4 Demonstrate the use of search engines
- 1.5 Describe the basic features and functions of e-mail

Unit 2: Spreadsheet Software

Upon completion of this unit of instruction the student will be able to:

- 2.1 Add, delete, and adjust individual cells, rows, and columns
- 2.2 Create, save and print a spreadsheet
- 2.3 Add, copy, delete, move information between cells and worksheets
- 2.4 Use the Help feature
- 2.5 Apply borders, shading, and patterns to a document
- 2.6 Format a data worksheet and know the steps needed to solve the formula
- 2.7 Formulate a table and create a chart showing the data

Unit 3: Word Processing Software

Upon completion of this unit of instruction the student will be able to:

- 5.1 Create, save, preview and print a document
- 5.2 Use the Help feature
- 5.3 Select and replace text
- 5.4 Understand how to move and copy text
- 5.5 Check spelling and grammar
- 5.6 Create Autocorrect entries
- 5.7 Find and replace text
- 5.8 Change fonts and font sizes, paragraph alignment, line spacing, paragraph spacing, and apply borders and shading
- 5.9 Indent paragraphs and align text with tabs
- 5.10 Create bulleted and numbered lists
- 5.11 Create and format a table
- 5.12 Add, delete and adjust the rows and columns
- 5.13 Calculate and sort data in a table
- 5.14 Split and merge cells within a table

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Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain a student portfolio with examples of all the required assignments.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all outside of class assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Completion
- Essays
- Short answer
- True or false

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90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: PHIL 1C
Course Name: Ethics
Total Semester Units: 3.0
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course provides an introduction to the ethical problems and issues in modern society. Students will discuss current events related to ethical issues and participate in group discussions.

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Discuss and explain how ethics and/or the lack of ethics impacts the individual and society
2. Assess and summarize the different theories of ethics
3. Contrast and compare the differences between personal and organizational ethics
4. Describe moral development
5. Develop awareness of the student's own Code of Ethics
6. Discuss contemporary ethical issues within society including abortion, capital punishment, cloning, euthanasia, war, sexuality, and animal testing
7. Evaluate and discuss ethical dilemmas commonly associated with the student's chosen profession

Grade Item Weights

- 17% Quizzes
- 50% Projects/Homework
- 33% Exams

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Course Outline

Unit Objectives

Unit 1: History and Development of Ethics and Morality

Upon completion of this unit of instruction the student will be able to:

- 1.1 Describe the historical, social, and cultural evolution of the study and theories of ethics and morality
- 1.2 Define ethics, morals, and values
- 1.3 Describe the stages of moral developmental
- 1.4 Inventory his/her personal belief system

Unit 2: Theories of Ethics and Morality

Upon completion of this unit of instruction the student will be able to:

- 2.1 Discuss both religious and secular ways of defining and looking at morality and ethics
- 2.2 Distinguish between consequentiality and nonconsequentialist theories of ethics, including ethical egoism, utilitarianism, and divine command theories
- 2.3 Differentiate the beliefs of major philosophers such as Aristotle, Immanuel Kant, and Sir William David Ross
- 2.4 Define various beliefs such as determinism, relativism, and absolutism
- 2.5 Identify the elements of justice, reward, and punishment as they relate to ethics and morality
- 2.6 Discuss the various problems and criticism of ethical theories and what elements potentially could be used to create a workable moral system

Unit 3: Current Issues in Ethics and Morality

Upon completion of this unit of instruction the student will be able to:

- 3.1 Discuss the concept of legality vs. morality
- 3.2 Discuss the pro and con arguments of current societal issues such as abortion, capital punishment, euthanasia, war, lying, cheating, stealing, and variations in sexuality
- 3.3 Discuss the pro and con arguments of current professional ethical issues such as cloning, sexual harassment, the media, and the use of animals for experimentation.
- 3.4 Apply the theories of ethics to case studies and scenarios involving current events

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Course Outline

Instructional Strategies and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: InfoTech Industry Certification Exam Preparation

Total Semester Units: 1.0

Total Hours: 30

Theory/Lecture Hours: 30

Application/Lab Hours: 0

Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with various methodologies for successfully completing appropriate industry certification examinations related to Information Technology courses completed. The development of a personalized plan for industry certification exam preparation will be completed.

Prerequisites:

This course is the last course in the certification award program or the Associate of Science Degree award program.

Course Outcomes

Upon completion of this course the student will be able to:

1. Complete a personalized industry certification exam preparation plan for the industry certificated exam identified in student's Information Technology area of concentration.
2. Schedule to take any outstanding industry certification exams identified in student's Information Technology concentration.

Grade Item Weights

- Pass or Fail

Unit Objectives

Unit 1: Industry Exam Preparation

Upon completion of this unit of instruction, the student will be able to:

- 1.1 Discuss various methods to prepare for industry certification exams
- 1.2 Perform a needs assessment of content areas outlining strengths and weaknesses
- 1.3 Develop an industry certification examination plan that is realistic and personal to the student for preparing for a successful examination outcome

Information Technology Program

Area 1: Network & Telecommunications Systems

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: Network+

Total Semester Units: 3.0

Total Hours: 45

Theory/Lecture Hours: 45

Application/Lab Hours: 0

Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to the basics of installing, configuring, and troubleshooting basic networking hardware, protocols and services. Students will also learn concepts of computer network technology and the terminology that is used across the industry.

Supported Certifications:

CompTIA Network+

Prerequisites:

A+ Hardware, A+ Software

Course Learning Outcomes

Upon completion of this course the student will be able to:

1. Explain the function of networking and routing protocols.
2. Describe common cable types and connectors.
3. Describe common WAN, LAN, and wireless technologies.
4. Explain the installation of wireless access points and clients.
5. Explain how to install and configure network devices.
6. Troubleshoot network connectivity issues with appropriate solutions.
7. Analyze network performance using appropriate tools and processes.
8. Explain the common vulnerabilities of networks and how they can be mitigated.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Overview of Networking

Upon completion of this unit of instruction the student will be able to:

- 1.1 List the different common networking protocols
- 1.2 Identify common network ports and their functions
- 1.3 Evaluate different network addressing technologies and addressing schemes
- 1.4 Identify network routing protocols
- 1.5 Describe different wireless communication standards
- 1.6 Explain basic data transmission concepts, including full duplexing, attenuation, latency, and noise
- 1.7 Describe the physical characteristics of coaxial cable, STP, UTP, and fiber-optic media
- 1.8 Compare the benefits and limitations of different networking media
- 1.9 Explain the principles behind and uses for serial cables
- 1.10 Identify wiring standards and the best practices for cabling buildings and work areas

Unit 2: WAN, LAN and Wireless Technologies

Upon completion of this unit of instruction the student will be able to:

- 2.1 Identify different WAN topologies, including their advantages and disadvantages
- 2.2 Compare the characteristics of WAN technologies, including switching type, throughput, media, security, and reliability
- 2.3 Describe several WAN transmission and connection methods, including PSTN, ISDN, T-carriers, DSL, broadband cable, broadband over powerline, ATM, and SONET
- 2.4 Explain how nodes exchange wireless signals and the potential obstacles involved in that exchange
- 2.5 List the characteristics of popular WLAN transmission methods (IEEE 802.11 a/b/g/n/ac)
- 2.6 Describe wireless WAN technologies, including 802.16 (WiMAX), HSPA+, LTE, and satellite communications
- 2.7 Install wireless access points and their clients
- 2.8 Configure wireless access points and their clients

San Joaquin Valley College

Course Outline

Unit 3: Network Hardware, Switching, and Routing Installation

Upon completion of this unit of instruction the student will be able to:

- 3.1 Identify the functions of LAN connectivity hardware
- 3.2 Install and configure NICs, hubs, bridges, switches, routers, and gateways
- 3.3 Explain the advanced features of a switch, different switching techniques, and VLAN management
- 3.4 Describe the purposes and properties of routing
- 3.5 Differentiate between common IPv4 and IPv6 routing protocols
- 3.6 Define virtualization and identify characteristics of virtual network components
- 3.7 Create and configure virtual servers, adapters, and switches as part of a network
- 3.8 Describe techniques for incorporating virtual components in VLANs
- 3.9 Explain methods for remotely connecting to a network by dial-up networking, virtual desktops, and thin clients
- 3.10 Explain VPNs and their protocols

Unit 4: Troubleshooting Network Issues

Upon completion of this unit of instruction the student will be able to:

- 4.1 Describe the steps involved in an effective troubleshooting methodology
- 4.2 Identify and resolve networking issues using a systematic troubleshooting process
- 4.3 Document symptoms, solutions, and results when troubleshooting network problems
- 4.4 Describe how to use hardware tools to troubleshoot connectivity issues, including cable testers, cable certifiers, crimpers, toner probes, and multimeters
- 4.5 Illustrate how to use software tools to troubleshoot connectivity issues, such as protocol analyzers, throughput testers, and operating system tools
- 4.6 Analyze network traffic using appropriate network monitoring resources
- 4.7 Describe the purpose of configuration management documentation
- 4.8 Explain different methods and rationales for network performance optimization

Unit 5: Network Security and Information Assurance

Upon completion of this unit of instruction the student will be able to:

- 5.1 Define malware, social engineering, and other types of network attacks
- 5.2 Identify the characteristics of a network that can be used to keep data safe from loss or damage
- 5.3 Explain fault-tolerance techniques for storage, network design, connectivity devices, naming and addressing services, and servers
- 5.4 Discuss best practices for network backup and recovery
- 5.5 Describe the components of a useful disaster recovery plan and the options for disaster contingencies

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: Windows Server Installation and Configuration

Total Semester Units: 4.0

Total Hours: 75

Theory/Lecture Hours: 45

Application/Lab Hours: 30

Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills for installing and configuring Microsoft Windows Server 2012. Students will learn how to install and configure Server Core, configure server roles and features, create virtual machines, manage core networking services, deploy Active Directory, and manage hosts.

Supported Certifications:

Can lead to MCSA Windows Server 2012

Prerequisites:

Network

Course Outcomes

Upon completion of this course the student will be able to:

1. Install and configure Server Core to optimize resource utilization, delegate administration, and use server features and services correctly.
2. Configure server roles and features so that users can save, share, and print data effectively.
3. Configure virtual machine settings so that computers can run guest operating systems, applications, and networks.
4. Deploy core networking services, including IP addresses, interoperability technologies, and DNS services and protocols.
5. Install and administer Active Directory to allow users access to a server.
6. Control the working environment of users' computers using Group Policy.
7. Configure Windows Firewall to support users' network security.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Server Installation and Configuration

Upon completion of this unit of instruction the student will be able to:

- 1.1 Create a plan for a server installation, server roles, and server upgrade
- 1.2 Install Server Core and optimize resource utilization by using Features on Demand
- 1.3 Migrate roles from previous versions of Windows Server
- 1.4 Configure Server Core by delegating administration, adding and removing features in offline images, deploying roles on remote servers, and configuring services and NIC teaming
- 1.5 Design storage spaces and configure basic and dynamic disks, create and mount virtual hard disks, and configure storage pools and disk pools
- 1.6 Configure file and share access by creating and configuring shares, share permissions, offline files, and NTFS permissions
- 1.7 Configure access-based enumeration (ABE), Volume Shadow Copy Service (VSS), and NTFS quotas
- 1.8 Configure print and document services by configure Easy Print driver, Enterprise Print Management, printer pooling, and printer permissions
- 1.9 Configure servers for remote management using WinRM
- 1.10 Configure down-level server management and multi-server management

Unit 2: Create and Configure Virtual Machines

Upon completion of this unit of instruction the student will be able to:

- 2.1 Create and configure dynamic memory, smart paging, Resource Metering, and guest integration services
- 2.2 Create virtual hard disks and HyperV virtual hard disks
- 2.3 Configure differencing drives and pass-through disks
- 2.4 Implement a virtual Fibre Channel adapter
- 2.5 Create and configure virtual networks by using Hyper-V Network Virtualization
- 2.6 Optimize network performance through Hyper-V virtual switches

Unit 3: Install and Manage Core Networking Services

Upon completion of this unit of instruction the student will be able to:

- 3.1 Configure IP address options through subnetting and supernetting
- 3.2 Configure interoperability between IPv4 and IPv6, ISATAP, and Teredo
- 3.3 Deploy and configure Dynamic Host Configuration Protocol (DHCP) service
- 3.4 Deploy and configure Domain Name Service (DNS) service, including configuring forwarders, managing DNS cache, and creating resource records

San Joaquin Valley College

Course Outline

Unit 4: Deploy Active Directory

Upon completion of this unit of instruction the student will be able to:

- 4.1 Install domain controllers, add or remove a domain controller from a domain, upgrade a domain controller, and install Active Directory Domain Services (AD DS) on a Server Core installation
- 4.2 Create and manage Active Directory users and computers
- 4.3 Create Active Directory groups and organizational units (OUs)
- 4.4 Manage Active Directory by configuring group nesting, managing group membership using Group Policy, and deleting groups and OUs

Unit 5: Manage Hosts Using Group Policy and Windows Firewall

Upon completion of this unit of instruction the student will be able to:

- 5.1 Create Group Policy objects (GPOs) by configuring a Central Store and managing starter GPOs
- 5.2 Configure security policies, User Rights Assignment, Security Options settings, and configure Security templates
- 5.3 Configure application restriction policies by configuring AppLocker rules and Software Restriction Policies
- 5.4 Configure firewall rules for multiple profiles using Group Policy
- 5.5 Configure connection security rules and Windows Firewall to allow or deny applications, scopes, ports, and users
- 5.6 Configure authenticated firewall exceptions
- 5.7 Import and export firewall settings

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

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Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

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Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: Windows Server Administration

Total Semester Units: 3.0

Total Hours: 75

Theory/Lecture Hours: 45

Application/Lab Hours: 30

Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills needed to administer and manage servers using Microsoft Windows Server 2012. Students will learn how to maintain servers, configure print and file services, configure network services and access, configure Network Policy Server infrastructure, and manage user accounts using Group Policy and Active Directory.

Supported Certifications:

Can lead to MCSA Windows Server 2012

Prerequisites:

Network

Course Outcomes

Upon completion of this course the student will be able to:

1. Manage and maintain servers using appropriate technologies and configuration methodologies.
2. Configure print and file services using distributed file systems, the file server resource manager, and appropriate file and disk encryption and audit policies.
3. Configure network services and access, including dial-up, VPN, and DirectAccess.
4. Set up and enforce organization-wide network access policies using Network Policy Server.
5. Configure Active Directory to authenticate and authorize users appropriately on a network.
6. Control how users access their computing environment and services using Group Policy.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Manage and Maintain Servers

Upon completion of this unit of instruction the student will be able to:

- 1.1 Deploy and manage server images
- 1.2 Configure and manage boot, install, and discover images
- 1.3 Update images with patches, hotfixes, and drivers
- 1.4 Install features for offline images
- 1.5 Implement patch management using appropriate technologies and services
- 1.6 Monitor servers by configuring alerts, monitoring real-time performance and events, and configure event subscriptions and network monitoring

Unit 2: Manage Print and File Services

Upon completion of this unit of instruction the student will be able to:

- 2.1 Configure a distributed file system (DFS) by installing and configuring DFS namespaces, replication targets, and replication scheduling
- 2.2 Configure quotas and reports within the File Server Resource Manager (FSRM)
- 2.3 Configure file and disk encryption using appropriate cryptographic algorithms and technologies
- 2.4 Configure advanced, expression-based and removable-audit policies using Group Policy

Unit 3: Manage Network Services and Access

Upon completion of this unit of instruction the student will be able to:

- 3.1 Configure Domain Name Service (DNS) zones by configuring primary and secondary zones, stub zones, conditional forwards, and zone and conditional forward storage in Active Directory
- 3.2 Create and configure DNS Resource Records (RR) including A, AAAA, PTR, SOA, NS, SRV, CNAME, and MX records
- 3.3 Configure DNS zone scavenging, record options, and secure dynamic updates
- 3.4 Configure VPN and routing settings using Network Address Translation (NAT) and remote dial-in settings for users
- 3.5 Configure DirectAccess

Unit 4: Configure Network Policy Server (NPS) Infrastructure

Upon completion of this unit of instruction the student will be able to:

- 4.1 Configure Network Policy Server (NPS) using multiple RADIUS server
- 4.2 Configure RADIUS clients, manage RADIUS templates, and configure RADIUS accounting
- 4.3 Configure NPS policy connection requests and network policies for VPN clients

San Joaquin Valley College

Course Outline

- 4.5 Configure Network Access Protection (NAP) using System Health Validators (SHVs)
- 4.6 Configure NAP enforcement using DHCP and VPN

Unit 5: Manage Active Directory and Group Policy

Upon completion of this unit of instruction the student will be able to:

- 5.1 Configure service authentication using appropriate services
- 5.2 Configure Domain Controllers
- 5.3 Maintain Active Directory using appropriate backup, restore, and optimization processes
- 5.4 Configure user passwords using an appropriate domain policy, settings objects, and lockout settings
- 5.5 Configure Group Policy processing order and precedence
- 5.6 Configure blocking of inheritance for user accounts
- 5.7 Import security templates and custom administrative template files
- 5.8 Manage Group Policy objects (GPOs) through back up, import, copy, and restore GPOs
- 5.9 Configure Group Policy preferences (GPP) settings so that users will gain appropriate use of their computer's settings and features

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

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- Written homework
- Research papers
- Term or other papers

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- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Wireless Local Area Networks
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills for installing and configuring wireless local area networks. Students will learn the fundamentals of wireless data transmissions, wireless LAN standards, security, and management and troubleshooting.

Supported Certifications:

Certified Wireless Network Administrator

Prerequisites:

Network

Course Learning Outcomes

Upon completion of this course the student will be able to:

1. Explain the fundamentals of radio frequency transmissions.
2. Describe how antennas function.
3. Explain the Physical Layer standards.
4. Explain the Media Access Control Layer standards.
5. Describe wireless LAN management architectures.
6. Explain how to conduct a site survey.
7. Describe the vulnerabilities of a wireless network.
8. Illustrate how to install a secure wireless network.
9. Explain how to manage a wireless LAN.
10. Illustrate wireless LAN troubleshooting and optimization.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Wireless Data Transmission Fundamentals

Upon completion of this unit of instruction the student will be able to:

- 1.1 Explain the basic principles of radio frequency transmissions
- 1.2 Describe the different types of analog and digital modulation
- 1.3 Explain the units of measurement for radio frequency transmissions
- 1.4 Describe how radio frequency waves behave and the impact of these behaviors on transmissions
- 1.5 Explain the different concepts that relate to antennas
- 1.6 Describe the types of antennas
- 1.7 Describe the antenna coverage patterns
- 1.8 Explain MIMO
- 1.9 Describe different antenna measurements

Unit 2: Wireless Standards

Upon completion of this unit of instruction the student will be able to:

- 2.1 Describe the different wireless modulation technologies
- 2.2 Explain the features in the 802.11b Physical Layer Standards
- 2.3 Describe the technologies found in the 802.11a PHY standards
- 2.4 Explain how the 802.11g Physical Layer Standards are different from the other standards
- 2.5 Describe the features in the 802.11n PHY standards
- 2.6 Describe the three WLAN service sets
- 2.7 Explain the features of MAC frames and MAC frame types
- 2.8 Describe the MAC functions of discovering, joining, and transmitting on a WLAN

Unit 3: Wireless LAN Architectures and Site Surveys

Upon completion of this unit of instruction the student will be able to:

- 3.1 Describe the features of an autonomous access point architecture
- 3.2 Explain the characteristics and features of a controller-based architecture
- 3.3 Describe the differences between multiple- and single-channel architecture models
- 3.4 Explain what a wireless network management system is and how it functions
- 3.5 Describe the characteristics of basic and enhanced power management technologies
- 3.6 Explain what a site survey is and how it can be used
- 3.7 Describe the tools used for conducting a site survey
- 3.8 Describe the procedures for performing a site survey

San Joaquin Valley College

Course Outline

Unit 4: Wireless Security

Upon completion of this unit of instruction the student will be able to:

- 4.1 Define information security
- 4.2 Describe the different types of wireless attacks
- 4.3 Describe the legacy IEEE security protections
- 4.4 Explain the vulnerabilities of wireless transmissions
- 4.5 Describe transitional security solutions
- 4.6 Describe the encryption and authentication features of IEEE 802.11i/WPA2
- 4.7 Illustrate how to install a secure wireless LAN using WPA2
- 4.8 Explain the features of wireless intrusion detection and wireless intrusion prevention systems
- 4.9 Demonstrate the use of wireless security tools

Unit 5: Managing, Troubleshooting, and Optimizing Wireless LANs

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe security defenses for WLANS
- 5.2 Describe the tools used for monitoring a wireless network
- 5.3 Explain how to maintain a WLAN
- 5.4 Describe the steps in troubleshooting RF interference
- 5.5 Explain the techniques in troubleshooting a WLAN configuration
- 5.6 Explain the steps in troubleshooting wireless devices
- 5.7 Describe how to optimize a WLAN
- 5.8 List the troubleshooting tools used by network technicians

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

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- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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Information Technology Program

Area 2: Database Development

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: Concepts of Database Management

Total Semester Units: 3.0

Total Hours: 45

Theory/Lecture Hours: 45

Application/Lab Hours: 0

Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to database management including topics such as basic database terminology, database management systems and their functions, advantages and disadvantages of database processing, the relational database model, database normalization, and database administration. Students will also cover advanced topics such as views, indexes, security, referential integrity, the system catalog, and the use of stored procedures, triggers, and data macros. After taking this class, students will be able to explain how databases work on a basic and detailed level, and how technicians interact with databases in the workplace.

Supported Certifications:

None

Prerequisites:

A+ Hardware, A+ Software

Course Outcomes

Upon completion of this course the student will be able to:

1. Define basic database terminology.
2. Use relational algebra using query-by-example (QBE) tools.
3. Use Structured Query Language (SQL) to manage data.
4. Use basic structural tools, such as indexes, referential integrity, stored procedures, triggers, and data macros to improve database functionality.
5. Successfully normalize a database.
6. Design a database using good database design principles.
7. Demonstrate the major functions of a database management system.
8. Explain the functions of database administration.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Introduction to Database Management

Upon completion of this unit of instruction the student will be able to:

- 1.1 Define basic database terminology
- 1.2 Describe database management systems (DBMSs)
- 1.3 Explain the advantages and disadvantages of database processing
- 1.4 Describe important features of the relational model of databases
- 1.5 Explain the common uses of Query-By-Example (QBE)
- 1.6 Use QBE to query a database
- 1.7 Retrieve data from a relational database through the use of relational algebra

Unit 2: Structured Query Language (SQL)

Upon completion of this unit of instruction the student will be able to:

- 2.1 Use simple and compound conditions in SQL
- 2.2 Use computed fields in SQL
- 2.3 Use built-in SQL functions and subqueries
- 2.4 Group records in SQL
- 2.5 Join tables using SQL
- 2.6 Perform union operations in SQL
- 2.7 Use SQL to update database data
- 2.8 Use an SQL query to create a table in a database
- 2.9 Explain how views are created
- 2.10 Use views to give each user his or her own view of the data in a database
- 2.11 Use indexes to improve database performance
- 2.12 Describe the important security features of a DBMS
- 2.13 Explain concepts relating to integrity such as entity integrity and referential integrity
- 2.14 Change the structure of a relational database
- 2.15 Describe the information maintained in a database's system catalog
- 2.16 Explain the use of stored procedures, triggers, and data macros to enhance performance

Unit 3: Normalization

Upon completion of this unit of instruction the student will be able to:

- 3.1 Explain how database administrators use functional dependence and primary keys to organize database information in order to eliminate update anomalies.
- 3.2 Define the four normal forms
- 3.3 Describe the problems associated with tables (relations) that are not in first normal form, second normal form, or third normal form, along with the mechanism for converting to all three
- 3.4 Explain the problems associated with incorrect conversions to third normal form

San Joaquin Valley College

Course Outline

- 3.5 Describe the problems associated with tables (relations) that are not in fourth normal form and describe the mechanism for converting to fourth normal form
- 3.6 Explain how normalization is used in the database design process

Unit 4: Database Design Methods and Functions

Upon completion of this unit of instruction the student will be able to:

- 4.1 Explain the general process and goals of database design
- 4.2 Define user views and explain their function
- 4.3 Define Database Design Language (DDL)
- 4.4 Use DDL to document database designs
- 4.5 Create an entity-relationship (E-R) diagram to visually represent a database design
- 4.6 Present a method for database design at the information level and view examples illustrating this method
- 4.7 Explain the physical-level design process
- 4.8 Explain top-down and bottom-up approaches to database design and examine the advantages and disadvantages of both methods
- 4.9 Describe how to review existing documents to obtain information prior to beginning the database design
- 4.10 Explain entity subtypes and their relationships to nulls
- 4.11 Describe how a DBMS handles updating and retrieving data
- 4.12 Explain the catalog feature of a DBMS
- 4.13 Illustrate the concurrent update problem and describe how a DBMS handles this problem
- 4.14 Explain the data recovery process in a database environment
- 4.15 Describe the security services provided by a DBMS
- 4.16 Describe the data integrity features provided by a DBMS
- 4.17 Explain the extent to which a DBMS achieves data independence
- 4.18 Define data replication

Unit 5: Data Integration and Monitoring

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe the need for database administration
- 5.2 Explain the database administrator's (DBA) responsibilities in formulating and enforcing database policies for access privileges, security, disaster planning, and archiving
- 5.3 Explain the DBA's administrative responsibilities for DBMS evaluation and selection, DBMS maintenance, data dictionary management, and training
- 5.4 Describe the DBA's technical responsibilities for database design, testing, and performance tuning
- 5.5 Explain client/server systems and their role in database deployments
- 5.6 Define data warehouses and explain their structure and access
- 5.7 Discuss the general concepts of object-oriented DBMSs

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

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3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Database Systems
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to the important aspects of fundamental database concepts including the relational database model, database normalization, structured query language, transaction management, performance tuning, distributed database management, and the role of databases in business intelligence and decision support. Students will also learn the role of database administration, security, and connectivity.

Supported Certifications:

None

Prerequisites:

Concepts of Database

Course Outcomes

Upon completion of this course the student will be able to:

1. Explain the important aspects of fundamental database concepts.
2. Describe the relational data base model and how it is applied.
3. Demonstrate normalization of database tables.
4. Demonstrate the use of structured query language.
5. Explain advanced concepts of good database design and management including transaction management, performance tuning, and distributed database management.
6. Explain the role of databases in supporting good business intelligence and decision support.
7. Describe the role of database administration, security, and connectivity.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Overview of Database Concepts

Upon completion of this unit of instruction the student will be able to:

- 1.1 Differentiate between data and information
- 1.2 Explain the various database types
- 1.3 List the main components and functions of a database system
- 1.4 Explain the concept of data modeling and why data models are important
- 1.5 Describe business rules and how they influence database design
- 1.6 Explain how data models can be classified by their level of extraction

Unit 2: Database Design Concepts

Upon completion of this unit of instruction the student will be able to:

- 2.1 Explain how the database model offers a logical view of data
- 2.2 Identify how a relation is the fundamental component of a relational database model
- 2.3 Explain how database operators, data dictionary, and the system catalog work
- 2.4 Identify how data redundancy is managed in relational databases
- 2.5 Relate why indexing is important in relational databases
- 2.6 Explain what normalization is and what role it plays in the database design process
- 2.7 Describe the normal forms: 1NF, 2NF, 3NF, BCNF, and 4NF
- 2.8 State how normalization and entity relationship modeling are used to produce good database design
- 2.9 Relate how normalization may be needed to improve performance

Unit 3: Advanced Database Design and Implementation

Upon completion of this unit of instruction the student will be able to:

- 3.1 Describe the basic commands and functions of structured query language (SQL)
- 3.2 Use SQL for data administration and manipulation
- 3.3 Use SQL to query a database and extract useful information

Unit 4: Advanced Database Concepts

Upon completion of this unit of instruction the student will be able to:

- 4.1 Describe database transactions and their properties
- 4.2 Explain what concurrency control is and what role it plays in maintaining the database's integrity
- 4.3 State the reasons for locking methods and explain how they work
- 4.4 Explain how database recovery management may be used to maintain database integrity

San Joaquin Valley College

Course Outline

- 4.5 Describe the use of distributed database management systems and their components
- 4.6 Relate how business intelligence provides a comprehensive business decision-support framework
- 4.7 Explain what a data warehouse is and how one is used
- 4.8 Describe the use of data analytics, data mining, and predictive analytics
- 4.9 Explain how online analytical processing is used

Unit 5: Database Connectivity and Administration

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe the various database connectivity technologies
- 5.2 Explain how web-to-database middleware is used to integrate databases with the Internet
- 5.3 Summarize the use of Extensible Markup Language (XML) and cloud computing in terms of database connectivity
- 5.4 Explain how a database plays a critical role in an organization
- 5.5 Describe the database administrator's managerial and technical roles
- 5.6 Relate the need for data security, database security, and an information security framework

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Structured Query Language
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to structured query language (SQL), including topics such as the use of typical SQL commands, single- and multi-table queries, database administration, and SQL functions and parameters. In addition, students will learn the various aspects of database design fundamentals.

Supported Certifications:

None

Prerequisites:

Concepts of Database

Course Outcomes

Upon completion of this course the student will be able to:

1. Illustrate various aspects of database design fundamentals.
2. Use typical SQL commands to manage data.
3. Use single-table queries to manage data.
4. Use multi-table queries to manage data.
5. Update data in a database.
6. Demonstrate typical methods of database administration using SQL.
7. Demonstrate typical SQL functions and procedures.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Database Design Fundamentals and Table Creation

Upon completion of this unit of instruction the student will be able to:

- 1.1 Explain database design concepts such as entity, attribute, relationship, and relation
- 1.2 Describe why primary keys are needed in tables
- 1.3 Explain how to convert an un-normalized relation to the first normal form
- 1.4 Create an entity-relationship diagram
- 1.5 Create and run SQL commands to manage data
- 1.6 Create and manage tables using SQL commands
- 1.7 Explain how to save SQL commands to a file
- 1.8 Describe a table's layout using SQL

Unit 2: Single-Table Queries

Upon completion of this unit of instruction the student will be able to:

- 2.1 Sort data using multiple keys and in ascending and descending order
- 2.2 Use simple and compound commands and queries
- 2.3 Use computed columns in queries
- 2.4 Use the BETWEEN, LIKE, and IN operators in queries
- 2.5 Retrieve data from a database using SQL commands
- 2.6 Use aggregate functions in a query to calculate sums, averages, counts, maximum values, and minimum values
- 2.7 Use subqueries to find results
- 2.8 Demonstrate the use of the GROUP BY function

Unit 3: Multi-Table Queries

Upon completion of this unit of instruction the student will be able to:

- 3.1 Use joins to retrieve data from more than one table
- 3.2 Use a subquery within a subquery to retrieve data
- 3.3 Demonstrate the correct use of an alias
- 3.4 Join a table to itself to combine data
- 3.5 Perform special operations including union, intersection, difference, inner joins, outer joins, and product functions to organize data more efficiently

San Joaquin Valley College

Course Outline

Unit 4: Database Administration

Upon completion of this unit of instruction the student will be able to:

- 4.1 Use several data management commands including UPDATE, INSERT, and DELETE in order to manage data automatically
- 4.2 Demonstrate how to drop a table
- 4.3 Create a new table from an existing table
- 4.4 Change the structure of an existing table
- 4.5 Use the COMMIT and ROLLBACK commands to make permanent data updates or to reverse updates
- 4.6 Explain how transactions work, specifically the role of COMMIT and ROLLBACK in supporting transactions
- 4.7 Create and drop views in a database
- 4.8 Explain the benefits of using different types of views
- 4.9 Use a view to update data
- 4.10 Grant and revoke users' database privileges
- 4.11 Explain the purpose, advantages, and disadvantages of using an index
- 4.12 Create, use, and drop an index
- 4.13 Obtain appropriate information from the system catalog
- 4.14 Use integrity constraints to control data entry

Unit 5: SQL Functions and Procedures

Upon completion of this unit of instruction the student will be able to:

- 5.1 Explain how to use functions in queries
- 5.2 Use the UPPER and LOWER functions with character data
- 5.3 Use the ROUND and FLOOR functions with numeric data
- 5.4 Use date functions in a query
- 5.5 Embed SQL commands in PL/SQL and T-SQL procedures
- 5.6 Use cursors to retrieve multiple rows in embedded SQL
- 5.7 Manage errors in procedures containing embedded SQL commands
- 5.8 Use SQL in a language that does not support embedded SQL commands
- 5.9 Use triggers to cause an associated database operation to occur

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Microsoft SQL Server 2012
Total Semester Units: 3.0
Total Hours: 135
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course is designed to introduce the student to Microsoft SQL Server 2012, including topics such as database architecture and design, security, data integrity, performance optimization, backup and recovery, and system monitoring. In addition, students will learn the core skills and develop the confidence necessary to become an effective database administrator on Microsoft SQL Server 2012.

Supported Certifications:

None

Prerequisites:

None

Course Outcomes

Upon completion of this course the student will be able to:

1. Install and deploy SQL Server 2012.
2. Analyze the architecture of SQL Server 2012 including how it is configured.
3. Create a database in SQL Server 2012.
4. Use the Transact-SQL language to manage data.
5. Demonstrate appropriate security management using SQL Server 2012.
6. Demonstrate the appropriate steps administrators should take to monitor and optimize databases.
7. Design backup and recovery solutions using appropriate techniques.
8. Demonstrate data integration and performance monitoring of SQL Server 2012.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Architecture, Configuration, and Deployment

Upon completion of this unit of instruction the student will be able to:

- 1.1 Describe the steps involved in planning a SQL Server 2012 installation
- 1.2 Explain the different installation options for installing SQL Server 2012
- 1.3 Create an instance of the SQL Server 2012 Enterprise Edition using the SQL Server Installation Wizard or the command prompt
- 1.4 Analyze the system changes that take place during a SQL Server 2012 installation
- 1.5 Manage an instance of SQL Server 2012 by performing repair and uninstall tasks
- 1.6 Describe the steps involved in planning a SQL Server 2012 installation
- 1.7 Explain the different installation options for installing SQL Server 2012
- 1.8 Create an instance of the SQL Server 2012 Enterprise Edition using the SQL Server Installation Wizard or the command prompt
- 1.9 Analyze the system changes that take place during a SQL Server 2012 installation
- 1.10 Manage an instance of SQL Server 2012 by performing repair and uninstall tasks

Unit 2: Creating and Using SQL Server 2012 Databases

Upon completion of this unit of instruction the student will be able to:

- 2.1 Plan a new user database that supports the relevant business requirements
- 2.2 Explain the benefits of tailoring the model system database settings for your organization
- 2.3 Construct a new database from Object Explorer or by executing an SQL query using Query Editor
- 2.4 Modify the configuration settings of an existing database, rename a database, and delete a database
- 2.5 Create new tables, and apply a foreign key relationship between two tables

Unit 3: Using Transact SQL

Upon completion of this unit of instruction the student will be able to:

- 3.1 Analyze and manipulate data stored in a SQL Server 2012 database using the Transact-SQL language
- 3.2 Create and modify database objects on a SQL Server 2012 instance using the Transact-SQL language
- 3.3 Construct a simple but effective logical security model for a SQL Server 2012 database using the Transact-SQL language

Unit 4: SQL Server Security

Upon completion of this unit of instruction the student will be able to:

- 4.1 Choose an appropriate authentication mode
- 4.2 Create secure client/server connections

San Joaquin Valley College

Course Outline

- 4.3 Manage access controls on database and server securables using the permissions hierarchy
- 4.4 Evaluate the different options for encrypting sensitive or confidential data

Unit 5: Database Administration

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe the different design factors that affect database performance
- 5.2 Improve database performance using appropriate problem detection, analysis, and resolution tools
- 5.3 Recognize index fragmentation
- 5.4 Discuss the criteria that should be incorporated in the design of an index and statistics maintenance plan
- 5.5 Evaluate the risks of data loss in conjunction with the business requirements to define recovery objectives
- 5.6 Compare the main database backup types
- 5.7 Design a backup plan that is optimized against a set of recovery objectives, and create database backups
- 5.8 Use SQL Server Agent to automate the backup tasks
- 5.9 Compare the different SQL Server management tools and utilities that can be used to integrate data from external sources
- 5.10 Design a SQL Server Integration Services package using both the SQL Server Import and Export Wizard and SQL Server Data Tools
- 5.11 Construct commands that utilize the bulk copy interface to import and export data from a SQL Server database
- 5.12 Describe the daily monitoring tasks a database administrator should complete to evaluate the status of critical services and processes
- 5.13 Use SQL Server Agent to configure automated alerts in response to system events and performance conditions
- 5.14 Explain the importance of establishing a baseline set of values for use as a benchmark when monitoring system performance
- 5.15 Assess the health of the system in real time using SQL Server Activity Monitor and the dynamic management views and functions
- 5.16 Analyze historical data using the data collector and the Management Data Warehouse repository

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

Information Technology Program

Area 3: Web Development

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: Introduction to Web Design

Total Semester Units: 3.0

Total Hours: 45

Theory/Lecture Hours: 45

Application/Lab Hours: 0

Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills needed to create, edit, and manage web sites. This course examines developing and enhancing web sites using HTML and CSS, site layout planning and navigation, and using typography, colors, images, and data tables. It also explores creating web sites across different operating systems, browsers, and devices.

Supported Certifications:

1. None

Prerequisites:

None

Course Outcomes

Upon completion of this course the student will be able to:

1. Describe web site planning procedures
2. Apply design principles to the create a web page
3. Generate a web page using HTML
4. Enhance web sites using cascading style sheets (CSS)
5. Use typography to enhance web pages
6. Analyze CSS box properties
7. Describe the principle elements of a page layout
8. Use color and graphics on a web page to enhance its layout
9. Use table elements to organize content effectively on a website
10. Create and use forms on a web page
11. Describe adjustments needed for browsers and connection speeds
12. Enhance a web site using navigation tools
13. Modify a web site for mobile devices

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Planning and Designing Web Sites

Upon completion of this unit of instruction the student will be able to:

CO1: Describe web site planning procedures

- 1.1 Describe the web site development process
- 1.2 Create a web site specification document
- 1.3 Identify the content goal of a web site by analyzing the potential audience
- 1.4 Examine the procedures for building a web site development team
- 1.5 Create a web site storyboard
- 1.6 Create conventions for filenames and URLs
- 1.7 Set a directory structure for a web server
- 1.8 Describe the process for designing a web page environment
- 1.9 Explain how to design a web page for user accessibility
- 1.10 Create and publish a basic web page
- 1.11 Modify a web page for different screen resolutions

Unit 2: Creating Web Pages Using HTML and CSS

Upon completion of this unit of instruction the student will be able to:

- 2.1 Discuss the evolution of HTML
- 2.2 Examine the fundamentals of HTML
- 2.3 Explain the new elements and features of HTML5
- 2.4 Create web pages using HTML
- 2.5 Discuss the use of good coding practices with HTML
- 2.6 Explain the benefits of using CSS
- 2.7 Generate a basic style sheet
- 2.8 Discuss how to use inheritance to write style rules
- 2.9 Apply basic selection techniques to a web site
- 2.10 Discuss CSS class and id selectors
- 2.11 Use elements to apply styles to groups of elements or sections of text
- 2.12 Use the class attribute and id attribute to provide customized styles
- 2.13 Discuss pseudo-selectors and pseudo-elements
- 2.14 Create special CSS effects such as hovers, generated content, drop caps, and typographic effects

San Joaquin Valley College

Course Outline

Unit 3: Enhancing Web Pages

Upon completion of this unit of instruction the student will be able to:

- 3.1 Discuss type design principles
- 3.2 Explain CSS measurement units
- 3.3 Modify a web page using CSS font and text properties
- 3.4 Build a font and text properties style sheet
- 3.5 Generate customize bulleted and numbered lists
- 3.6 Examine the CSS visual formatting model
- 3.7 Use the CSS box model to modify a web page
- 3.8 Apply the margin, padding, and border properties to a web page
- 3.9 Use the page layout box properties on a web page
- 3.10 Create a simple page layout
- 3.11 Control the margin, padding, and border characteristics of block-level elements.
- 3.12 Use special box properties such as width, height, float, and clear to create containers for content on web pages
- 3.13 Discuss the normal flow of elements
- 3.14 Create a web page using content containers with division element and sectioning elements
- 3.15 Create floating layouts on a web page
- 3.16 Discuss the standard graphics file formats
- 3.17 Explain how to select the appropriate graphics tool
- 3.18 Use the image element on a web page
- 3.19 Explain how to use image properties with CSS
- 3.20 Create multiple web page color schemes
- 3.21 Discuss how to control color properties with CSS
- 3.22 Control background images with CSS on a web page

Unit 4: Using Tables and Forms

Upon completion of this unit of instruction the student will be able to:

- 4.1 Discuss table elements
- 4.2 Use table headers and footers on a web page
- 4.3 Apply padding, margins, and floats to tables
- 4.4 Examine style table background colors
- 4.5 Use table styles on a web page
- 4.6 Explain how forms work
- 4.7 Use the form element to create forms
- 4.8 Create input objects for a web page
- 4.9 Use style and build forms on a web page
- 4.10 Discuss how forms are used for online commerce

San Joaquin Valley College

Course Outline

Unit 5: Creating Web Sites for Mobile Platforms

Upon completion of this unit of instruction the student will be able to:

- 5.1 Explain common browser compatibility issues
- 5.2 Describe how to test websites on various browsers and operating systems
- 5.3 Explain how to improve download time
- 5.4 Build a flexible page layout
- 5.5 Build a fixed page layout
- 5.6 Design navigation elements for mobile devices
- 5.7 Discuss using graphics for navigation and linking
- 5.8 Build text-based navigation on a web site
- 5.9 Create lists for web site navigation
- 5.10 Build horizontal and vertical navigation bars
- 5.11 Use background color and graphics to enhance navigation
- 5.12 Create hover rollovers on a web page
- 5.13 Discuss the need for responsive web design
- 5.14 Use media queries to apply conditional styles on a web page
- 5.15 Build a basic media query
- 5.16 Create flexible responsive layouts and responsive navigation schemes for mobile devices
- 5.17 Generate a responsive web page design for desktops, tablets, and smartphones

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: HTML
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills needed to use HTML for creating and maintaining web sites. This course examines creating and editing a web page using inline style sheets, creating tables in a web site using an external style sheet, creating an image map, creating pop-up windows, adding scrolling messages, and validating forms.

Supported Certifications:

1. None

Prerequisites:

None

Course Outcomes

Upon completion of this course the student will be able to:

1. Describe the nature and important functions of HTML, CSS, and XHTML
2. Create a basic web page using HTML tags
3. Create a web page using HTML links, images, and embedded style sheets
4. Create tables using external style sheets
5. Create an image map
6. Create a form
7. Use advanced CSS elements to improve a website
8. Add multimedia content to web pages
9. Embed JavaScript into HTML documents
10. Write advanced JavaScript functions
11. Use the Document Object Model (DOM) to control actions on a website
12. Create XML documents

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Introduction to HTML

Upon completion of this unit of instruction the student will be able to:

- 1.1 Discuss how Web browsers function
- 1.2 Describe the Hypertext Markup Language (HTML) and the HTML5 standards used for web development
- 1.3 Explain the use of Cascading Style Sheets (CSS) in Web development
- 1.4 Define the Document Object Model (DOM) and describe its relationship to HTML
- 1.5 Define Extensible Hypertext Markup Language (XHTML) and describe its relationship to HTML
- 1.6 Identify tools used to create HTML documents
- 1.7 Describe the phases of the web development life cycle
- 1.8 Describe the different methods of web site design and the purpose of each web site structure
- 1.9 Discuss the importance of testing throughout the web development life cycle

Unit 2: Creating Basic Web Pages Using HTML

Upon completion of this unit of instruction the student will be able to:

- 2.1 Identify the elements of a web page
- 2.2 Create HTML code in a text editor
- 2.3 Use HTML tags to create a web page
- 2.4 Create unordered, ordered, and definition lists
- 2.5 Identify web page image types and attributes
- 2.6 Edit a web page by performing tasks such as adding an image, changing the color of headings, and change a bulleted list style
- 2.7 Describe how to review HTML source code in a browser
- 2.8 Describe linking
- 2.9 Explain how to enhance a web page using images
- 2.10 Change the body and heading format using embedded style sheets
- 2.11 Discuss how to align and add color to text using embedded and inline styles
- 2.12 Add hyperlinks to a web page
- 2.13 Add an email link to a web page
- 2.14 Discuss absolute and relative paths
- 2.15 Use style classes to add an image with wrapped text
- 2.16 Add links to targets within a web page

Unit 3: Using Advanced HTML Features

Upon completion of this unit of instruction the student will be able to:

- 3.1 Define table elements
- 3.2 Describe the steps used to plan, design, and code a table
- 3.3 Create a borderless table for a horizontal navigation bar with text links

San Joaquin Valley College

Course Outline

- 3.4 Create an external style sheet to define styles
- 3.5 Explain how to use classes for enhanced control over styles
- 3.6 Link an external style sheet to web pages in order to apply styles
- 3.7 Create a table with borders and insert text
- 3.8 Use the box-shadow property to alter the appearance of an image
- 3.9 Use the border spacing and padding properties
- 3.10 Utilize inline styles to alter the style of individual elements on a web page
- 3.11 Explain how to add background color to rows and cells
- 3.12 Insert a caption below a table
- 3.13 Discuss the steps for creating headings that span rows
- 3.14 Define terms relating to image mapping
- 3.15 List the differences between server-side and client-side image maps
- 3.16 Explain the components of an image map
- 3.17 Describe the steps to implement an image map
- 3.18 Create hotspots on an image
- 3.19 Describe how the x- and y-coordinates relate to vertical and horizontal alignment
- 3.20 Insert an image onto a web page that is used as an image map
- 3.21 Explain how to use the usemap attribute to define an image map
- 3.22 Use map and area tags on a web page
- 3.23 Describe the different form controls and their uses
- 3.24 Use form and input tags in a web page
- 3.25 Create a text box and check boxes
- 3.26 Create a selection menu with multiple options
- 3.27 Use select and options tags in a web page
- 3.28 Create radio buttons
- 3.29 Create a submit and reset button

Unit 4: Working With CSS and Multimedia

Upon completion of this unit of instruction the student will be able to:

- 4.1 Add an embedded style sheet to a web page
- 4.2 Change the body and link styles using an embedded style sheet
- 4.3 Explain how to create a drop-down menu using an embedded style sheet
- 4.4 Discuss the steps for changing the color and font styles of drop-down menus
- 4.5 Create an external style sheet
- 4.6 Change the paragraph margins and font styles using an external style sheet
- 4.7 Discuss how to create a pop-up effect using an external style sheet
- 4.8 Use classes, pseudoclasses, and divisions for a pop-up effect
- 4.9 Insert a link to an external style sheet
- 4.10 Describe the benefits and limitations of multimedia in web sites
- 4.11 Explain the different audio and video formats
- 4.12 Add an audio clip to a web page using the HTML5 audio element
- 4.13 Add a video clip to a web page using the HTML5 video element

San Joaquin Valley College

Course Outline

Unit 5: Advanced HTML

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe how JavaScript can be integrated with HTML5
- 5.2 Describe JavaScript user-defined functions
- 5.3 Explain JavaScript variables
- 5.4 Write JavaScript code to create a script section on a web page
- 5.5 Write a user-defined JavaScript function
- 5.6 Create a script to extract the current system date from the operating system
- 5.7 Use the innerHTML property to display a dynamic message on a web page
- 5.8 Use an event handler to invoke a JavaScript user-defined function when a web page is loaded
- 5.9 Write a JavaScript user-defined function to perform specific actions
- 5.10 Describe how to open a pop-up window
- 5.11 Define if and if... else statements, conditionals, and operands
- 5.12 Write a JavaScript user-defined function to format output in a text field
- 5.13 Define the Document Object Model (DOM)
- 5.14 Describe how mouse event handlers control image rollovers
- 5.15 Integrate Cascading Style Sheets (CSS) with JavaScript statements to position elements on a web page
- 5.16 Use JavaScript elements to control a floating image on a page
- 5.17 Call JavaScript functions directly using the JavaScript command
- 5.18 Use mouse event handlers to control pop-up captions
- 5.19 Define an array and describe how to create an array instance
- 5.20 Explain the differences between XML and HTML
- 5.21 Describe an XML document instance
- 5.22 Describe an XML Schema Definition (XSD) language file
- 5.23 Explain the rules for creating a valid XML document
- 5.24 Define the purpose of the processing instruction, the document prolog, and the document instance
- 5.25 Create and bind an XSL style sheet file to an XML document
- 5.26 Discuss the built-in table element methods for displaying an XML document in a table
- 5.27 Create a JavaScript user-defined function to search an XML document

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: JavaScript Programming
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills needed to use the JavaScript programming language for developing web applications. Topics include developing applications for touchscreen and mobile devices, using the jQuery library, building arrays, working with forms and strings, and using object-oriented JavaScript.

Supported Certifications:

1. None

Prerequisites:

None

Course Outcomes

Upon completion of this course the student will be able to:

1. Create basic functional JavaScript code
2. Use functions and operators in JavaScript
3. Describe how arrays can be created and populated in JavaScript
4. Use appropriate error handling and debugging techniques in JavaScript
5. Validate content using forms in JavaScript applications
6. Examine how to manipulate data in strings and arrays
7. Explain the Document Object Model (DOM) and Dynamic HTML (DHTML)
8. Describe how to manage state information
9. Use object-oriented JavaScript to create an application
10. Create JavaScript applications for touchscreen and mobile devices
11. Discuss updating web pages with Ajax
12. Examine how to implement jQuery

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: JavaScript Overview

Upon completion of this unit of instruction the student will be able to:

- 1.1 Examine client/server architectures and client-side and server-side scripting
- 1.2 Explain JavaScript variables
- 1.3 Describe JavaScript expressions and events
- 1.4 Create web pages with JavaScript elements
- 1.5 Create valid XHTML Code with JavaScript
- 1.6 Define JavaScript functions
- 1.7 Create an application using built-in JavaScript functions
- 1.8 Describe data types such as numeric values, Boolean values, and strings
- 1.9 Build JavaScript expressions using arithmetic and assignment operators
- 1.10 Examine comparison and conditional operators
- 1.11 Describe operator precedence

Unit 2: Arrays and Error Handling

Upon completion of this unit of instruction the student will be able to:

- 2.1 Explain how JavaScript can be used for storing data in arrays
- 2.2 Discuss how to use the array object
- 2.3 Examine how to implement repeating code in JavaScript using while, do/while, and for statements
- 2.4 Describe decision making constructs in JavaScript
- 2.5 Explain the procedures for handling errors
- 2.6 Create a JavaScript application with basic debugging techniques
- 2.7 Describe how to trace errors using JavaScript debugging tools
- 2.8 Use the debugger Window to identify errors by setting breakpoints
- 2.9 Discuss handling exceptions and errors
- 2.10 Examine advanced error handling procedures including strict mode

Unit 3: Working With Forms and Strings

Upon completion of this unit of instruction the student will be able to:

- 3.1 Explain how to use forms with JavaScript
- 3.2 Design a JavaScript form to collect content
- 3.3 Explain how to customize browser-based validation with parameters and feedback
- 3.4 Discuss programming custom validation
- 3.5 Explain how to manipulate strings using JavaScript
- 3.6 Discuss formatting strings with special characters, finding and extracting characters and substrings, and comparing strings
- 3.7 Describe how to work with regular expressions
- 3.8 Explain how to manipulate arrays by finding and extracting elements and values
- 3.9 Create a JavaScript application that converts between data types

San Joaquin Valley College

Course Outline

Unit 4: Using Object-Oriented JavaScript and Securing Applications **Upon completion of this unit of instruction the student will be able to:**

- 4.1 Explain the browser object model and the Document Object Model
- 4.2 Discuss accessing document elements, content, properties, and attributes in JavaScript
- 4.3 Examine how to add and remove document nodes
- 4.4 Explain how to use the history, location, navigator, and screen objects
- 4.5 Explain JavaScript state information
- 4.6 Discuss how to store state information in cookies and web storage APIs
- 4.7 Explain security issues associated with JavaScript
- 4.8 Explain the benefits of object-oriented programming
- 4.9 Discuss how to reuse software objects with encapsulation and classes
- 4.10 Explain how to use the date, number, and math classes
- 4.11 Create an application using custom JavaScript objects

Unit 5: Advanced JavaScript **Upon completion of this unit of instruction the student will be able to:**

- 5.1 Explain touch events and pointer events
- 5.2 Create a drag-and-drop application
- 5.3 Describe how to use programming interfaces for mobile devices
- 5.4 Create an application using the geolocation API
- 5.5 Describe how to enhance mobile web apps
- 5.6 Explain Ajax and its limitations
- 5.7 Discuss HTTP requests and responses
- 5.8 Explain the process for requesting server data
- 5.9 Explain the process for receiving server data
- 5.10 Discuss how to create cross-domain requests without the use of a proxy server
- 5.11 Describe jQuery
- 5.12 Explain how to implement a jQuery statement
- 5.13 Discuss how to traverse the DOM with jQuery methods
- 5.14 Explain how to use jQuery built-in effects

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

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3. Methods to Measure Achievement of Student Learning Outcomes:

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a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Web Development with Adobe Dreamweaver
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills needed to use Adobe Dreamweaver to design and author websites effectively. This course examines the Dreamweaver interface, features, and functionality. Topics includes working with text and cascading style sheets, images, links and navigation, style sheets, forms, and interactive elements.

Supported Certifications:

1. Adobe Certified Associate: Web Authoring Using Adobe Dreamweaver

Prerequisites:

None

Course Outcomes

Upon completion of this course the student will be able to:

1. Examine the basic features of Dreamweaver
2. Develop a web page using Dreamweaver
3. Implement CSS in Dreamweaver
4. Add images using Dreamweaver
5. Add links and navigation elements to a web page
6. Create and manipulate content using tables
7. Manage a web server and related files
8. Use styles and style sheets in the design and building of web pages in Dreamweaver
9. Use forms in the design and building of web pages in Dreamweaver
10. Add media to web pages using Dreamweaver

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Introduction to Adobe Dreamweaver

Upon completion of this unit of instruction the student will be able to:

- 1.1 Discuss how Dreamweaver can be used to develop a web site
- 1.2 Examine the features of Dreamweaver
- 1.3 Explore the Dreamweaver workspace
- 1.4 Describe how to plan a website using Dreamweaver
- 1.5 Add folders and pages to a web site
- 1.6 Discuss how to create Dreamweaver heading content and set page properties
- 1.7 Explain how to create, import, and format text
- 1.8 Add links to web pages using Dreamweaver
- 1.9 Use the Dreamweaver History panel
- 1.10 Describe how to edit Dreamweaver code
- 1.11 Modify and test Dreamweaver web pages

Unit 2: Using Cascading Style Sheets and Images

Upon completion of this unit of instruction the student will be able to:

- 2.1 Explain how to create unordered and ordered lists
- 2.2 Create a Cascading Style Sheet using Dreamweaver
- 2.3 Describe how to apply, edit and add rules
- 2.4 Discuss Dreamweaver media queries
- 2.5 Add Adobe Edge web fonts to web sites
- 2.6 Use coding tools to view and edit rules
- 2.7 Discuss how to insert and align images using CSS in Dreamweaver
- 2.8 Describe how to enhance an image
- 2.9 Examine the use of alternate text
- 2.10 Insert a background image using Dreamweaver
- 2.11 Use Dreamweaver to add graphic enhancements

Unit 3: Working with Links and Navigation

Upon completion of this unit of instruction the student will be able to:

- 3.1 Create external and internal links using Dreamweaver
- 3.2 Discuss how to use IDs to navigate to specific page locations
- 3.3 Examine the steps to create, modify, and copy a menu bar
- 3.4 Use Dreamweaver to create an image map
- 3.5 Manage website links with Dreamweaver
- 3.6 Explain how to create a page using a Fluid Grid layout
- 3.7 Create a table using Dreamweaver
- 3.8 Resize, split, and merge table cells
- 3.9 Explain how to insert and align images in table cells
- 3.10 Insert text and format cell content in a table

San Joaquin Valley College

Course Outline

Unit 4: Working With Advanced Dreamweaver Features

Upon completion of this unit of instruction the student will be able to:

- 4.1 Publish a Dreamweaver website and transfer files
- 4.2 Use Dreamweaver to check files in and out
- 4.3 Discuss how to perform website maintenance
- 4.4 Discuss how to cloak files
- 4.5 Import and export a site definition using Dreamweaver
- 4.6 Discuss how to create and use embedded styles with Dreamweaver
- 4.7 Examine how to modify embedded styles
- 4.8 Use the Dreamweaver Live view and Inspect Mode

Unit 5: Adding Forms and Interactivity

Upon completion of this unit of instruction the student will be able to:

- 5.1 Explain how forms work
- 5.2 Use Dreamweaver to create forms
- 5.3 Discuss how to edit forms
- 5.4 Explain how to use form objects
- 5.5 Explain how to add Flash objects
- 5.6 Discuss how to modify Flash objects
- 5.7 Add rollover images using Dreamweaver
- 5.8 Discuss how to use behaviors and CSS transitions to web pages
- 5.9 Explain how to add video and sound using Dreamweaver

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

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65	-	69%	=	D
Below		65%	=	F

Information Technology Program

Area 4: Security

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Network Security
Total Semester Units: 3.0
Total Hours: 135
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills to design and manage network perimeter defenses. Topics covered include intrusion detection, firewalls, security policies, network address translation (NAT), packet filtering and analysis, proxy servers, virtual private networks (VPN), and analyzing network traffic signatures.

Supported Certifications:

None

Prerequisites:

None

Course Outcomes

Upon completion of this course the student will be able to:

1. Analyze network traffic signatures using appropriate technologies and configuration methodologies.
2. Configure routers for security by applying access control lists.
3. Explain cryptographic standards and how they can be used.
4. Implement wireless security defenses by using IEEE protocols.
5. Configure intrusion detection and prevention devices for optimum protection.
6. Illustrate how to manage and configure firewalls, proxy servers, and bastion hosts.
7. Plan a virtual private network for secure transmissions.
8. Explain how to harden web and Internet services against attackers.
9. Develop an enterprise-wide security policy.
10. Explain how to maintain a secure network.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Evaluate Traffic Signatures and Router Security

Upon completion of this unit of instruction the student will be able to:

- 1.1 Explain the Common Vulnerabilities and Exposures (CVE) standard
- 1.2 Describe the concepts of signature analysis
- 1.3 Use technologies to detect normal and suspicious traffic signatures
- 1.4 Identify suspicious events
- 1.5 Describe the routing process
- 1.6 Configure a router for security
- 1.7 Explain basic router security controls
- 1.8 Create access control lists

Unit 2: Discuss Cryptographic Algorithms

Upon completion of this unit of instruction the student will be able to:

- 2.1 Describe the components of cryptographic protocols
- 2.2 Explain common cryptography standards and methods
- 2.3 Given a scenario, determine which cryptographic algorithm is appropriate
- 2.4 Describe key management and how it can be used
- 2.5 Explain modern cryptographic methods for security

Unit 3: Install and Manage Wireless Network

Upon completion of this unit of instruction the student will be able to:

- 3.1 Describe the different types of wireless network attacks
- 3.2 Explain the vulnerabilities in IEEE 802.11 security
- 3.3 Explain the solutions for securing a wireless network
- 3.4 Configure wireless devices for optimum security

Unit 4: Configure Network Devices

Upon completion of this unit of instruction the student will be able to:

- 4.1 Identify the components of an intrusion detection and prevention system
- 4.2 Describe options for implementing intrusion detection and prevention systems
- 4.3 Explain the steps of intrusion detection
- 4.4 Describe detection methodologies
- 4.5 Compare intrusion detection and prevention systems
- 4.6 Develop intrusion detection and prevention filter rules
- 4.7 Explain the purpose and function of firewalls
- 4.8 Compare hardware and software firewalls
- 4.9 Describe common approaches to packet filtering
- 4.10 Design packet filtering and firewall rule sets
- 4.11 Install and configure a proxy server

San Joaquin Valley College

Course Outline

- 4.12 Describe and plan the configuration of a bastion host
- 4.13 Describe and plan the configuration of a honeypot
- 4.14 Configure Network Address Translation
- 4.15 Perform the basic configuration of a firewall
- 4.16 Explain basic VPN concepts
- 4.17 Describe encapsulation and encryption in VPNs
- 4.18 Explain how VPNs authenticate users and devices
- 4.19 Explain how to plan VPN deployments
- 4.20 Describe options for VPN configurations
- 4.21 Explain methods for adjusting packet-filtering rules for VPNs
- 4.22 Describe how to review VPN policies and procedures

Unit 5: Manage Secure Networks

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe weak points in the structure of the Internet
- 5.2 Explain attack techniques against Web sites and Web users
- 5.3 Explain methods for hardening Web and Internet resources
- 5.4 Describe the system development life cycle
- 5.5 Explain the fundamental concepts of risk analysis
- 5.6 Describe different approaches to risk analysis
- 5.7 Explain the process of risk analysis
- 5.8 Describe techniques to minimize risk
- 5.9 Explain important concepts in security policies
- 5.10 Identify categories of a security policy
- 5.11 Define incident handling procedures
- 5.12 Manage security events
- 5.13 Audit network security procedures
- 5.14 Manage an intrusion detection and prevention system
- 5.15 Improve network defense by changing a defense-in-depth configuration

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

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- Exams
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- Skill competencies
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- Multiple choice
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- Essays
- Short answer
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65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name:

Penetration Testing

Total Semester Units:

4.0

Total Hours:

75

Theory/Lecture Hours:

45

Application/Lab Hours:

30

Externship/Clinical Hours:

0

Course Description:

This course is designed to introduce the fundamentals of penetration testing. Topics covered include scanning tools, sniffers, spoofing, session hijacking, denial-of-service attacks, and programming exploits.

Supported Certifications:

None

Prerequisites:

Network Security, Security+

Course Outcomes

Upon completion of this course the student will be able to:

1. Analyze vulnerabilities using reconnaissance, scanning tools and sniffers.
2. Explain TCP/IP vulnerabilities and how they can be used in an attack.
3. Illustrate the need for strong passwords.
4. Describe defenses against spoofing and session hijacking attacks.
5. Analyze penetration testing attacks on various network devices.
6. Formulate strategies to detect Trojan Horse attacks on a network.
7. Explain how to prevent denial-of-service attacks.
8. Describe buffer overflows and programming exploits and how they can be used.
9. Explain email vulnerabilities that can be exploited in an attack.
10. Describe web application attacks.
11. Explain Windows operating system vulnerabilities.
12. Describe UNIX and Linux operating system vulnerabilities.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Use Reconnaissance Tools

Upon completion of this unit of instruction the student will be able to:

- 1.1 Identify techniques for performing reconnaissance
- 1.2 Describe the methods used in social engineering attacks
- 1.3 Describe the methods for Internet footprinting
- 1.4 Explain the purpose, evolution, and function of scanners
- 1.5 Describe the various types of scanning
- 1.6 Describe the types of sniffer programs
- 1.7 Explain the functions that sniffers use on a network
- 1.8 Describe how sniffers work
- 1.9 Implement methods used in spotting sniffers
- 1.10 Explain the techniques used to protect networks from sniffers
- 1.11 Define TCP/IP
- 1.12 List the steps of TCP/IP communication
- 1.13 Describe the weaknesses of TCP/IP
- 1.14 Identify the steps to protect information from vulnerabilities in TCP/IP

Unit 2: Compromise Systems Through Penetration Testing

Upon completion of this unit of instruction the student will be able to:

- 2.1 Explain basic cryptographic principles
- 2.2 Explain the fundamentals of encryption
- 2.3 Describe the most common ciphers in use today
- 2.4 Identify common attacks on passwords
- 2.5 Use different programs for cracking passwords
- 2.6 Explain the mechanics of spoofing
- 2.7 Describe the consequences of spoofing
- 2.8 Define various types of spoofing
- 2.9 Describe spoofing tools
- 2.10 Explain how to defend against spoofing
- 2.11 Define session hijacking
- 2.12 Identify the styles of session hijacking
- 2.13 Describe session-hijacking tools
- 2.14 Explain the differences between TCP hijacking and UDP hijacking
- 2.15 Describe measures to defend against session hijacking
- 2.16 Describe the vulnerabilities of proxy servers
- 2.17 Explain how routers and switches can be compromised
- 2.18 Identify the vulnerabilities of firewalls
- 2.19 Describe how to exploit the vulnerabilities of virtual private networks (VPNs)

San Joaquin Valley College

Course Outline

Unit 3: Detect and Defend Against Host-Based Attacks

Upon completion of this unit of instruction the student will be able to:

- 3.1 Outline the evolution of the Trojan Horse
- 3.2 Describe different ways in which Trojan Horses are deployed
- 3.3 Identify risks associated with Trojan Horses
- 3.4 Describe Trojan-attack prevention measures
- 3.5 Explain the function of Trojan-detection tools
- 3.6 Explain what a distributed denial-of-service (DDoS) attack is
- 3.7 Explain the function of denial-of-service (DoS) attacks
- 3.8 Describe the causes of DoS attacks
- 3.9 Discuss different DoS and DDoS attacks
- 3.10 Describe ways to prevent DoS and DDoS attack
- 3.11 Define buffer overflow
- 3.12 List the types of buffer overflows
- 3.13 Identify the techniques used to cause buffer overflows
- 3.14 Identify the tools that can be used to detect buffer overflow conditions
- 3.15 Explain the methods used to prevent buffer overflows
- 3.16 Describe the evolution of programming exploits
- 3.17 Explain the vulnerabilities in the C and C++ programming languages
- 3.18 Identify steps to counter vulnerabilities in programming languages
- 3.19 Discuss the vulnerabilities in HTML5
- 3.20 Identify steps to counter vulnerabilities in HTML5
- 3.21 Explain the vulnerabilities in Java and JavaScript

Unit 4: Defend Against Internet Attacks

Upon completion of this unit of instruction the student will be able to:

- 4.1 Describe SMTP, POP, and IMAP vulnerabilities
- 4.2 Identify email server application vulnerabilities
- 4.3 Explain the types of email-related attacks
- 4.4 Explain Web server vulnerabilities
- 4.5 Describe methods to protect Web servers against vulnerabilities
- 4.6 Explain Web browser vulnerabilities
- 4.7 Explain session ID exploits
- 4.8 Describe protective measures for Web browsers

Unit 5: Discuss Operating System Vulnerabilities

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe the Windows operating systems
- 5.2 Explain the vulnerabilities of Windows operating systems
- 5.3 Explain UNIX-based operating systems
- 5.4 Describe the Linux operating systems
- 5.5 Explain vulnerabilities from default installations
- 5.6 Describe vulnerabilities in UNIX-based and Linux utilities

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology

Program: Information Technology

Course Number:

Course Name: Computer Forensics

Total Semester Units: 4.0

Total Hours: 75

Theory/Lecture Hours: 45

Application/Lab Hours: 30

Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills to perform computer forensics. This course focuses on techniques and practices for gathering and analyzing evidence used to solve crimes involving computers by using current forensics software.

Supported Certifications:

None

Prerequisites:

Security+, Network Security

Course Outcomes

Upon completion of this course the student will be able to:

1. Describe how data acquisition is used in a forensic investigation.
2. List the steps for processing a crime scene.
3. Describe standard computer forensics tools.
4. Summarize how to recover data from Microsoft systems.
5. Explain how to recover data from Apple and Linux systems.
6. Discuss computer forensics analysis and validation.
7. Explain how to recover graphics files.
8. Illustrate how to recover data from virtual machines and networks.
9. Describe how to perform email investigations.
10. Explain how to use forensics tools on mobile devices.
11. Demonstrate how to write forensic reports.
12. Explain how forensics experts testify.
13. Describe ethical standards for forensics personnel.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Acquire and Process Forensic Data

Upon completion of this unit of instruction the student will be able to:

- 1.1 Describe different digital evidence storage formats
- 1.2 Explain ways to determine optimal acquisition methods
- 1.3 Explain how to use forensic acquisition tools
- 1.4 Describe how to validate data acquisitions
- 1.5 Explain how to use remote network acquisition tools
- 1.6 Explain the protocols for controlling digital evidence
- 1.7 Describe how to collect evidence at private-sector incident scenes
- 1.8 Explain the guidelines for processing law enforcement crime scenes
- 1.9 Discuss how to prepare for an evidence search
- 1.10 Describe how to secure a computer crime scene
- 1.11 Explain the steps for seizing digital evidence at a crime scene
- 1.12 Illustrate procedures for storing digital evidence
- 1.13 Explain how to obtain a digital hash

Unit 2: Analyze Common Platforms Using Forensic Tools

Upon completion of this unit of instruction the student will be able to:

- 2.1 Explain how to evaluate computer forensics tools
- 2.2 Describe the available computer forensics software tools
- 2.3 Describe methods for validating and testing computer forensics tools
- 2.4 Explain the purpose and structure of file systems
- 2.5 Describe the Microsoft file structures
- 2.6 Explain the structure of New Technology File System (NTFS) disks
- 2.7 Describe options for decrypting drives encrypted with whole disk encryption
- 2.8 Explain how the Windows Registry works
- 2.9 Describe Microsoft startup tasks
- 2.10 Explain Apple file structures
- 2.11 Describe the Apple boot process
- 2.12 Explain UNIX and Linux disk structures and boot processes

Unit 3: Demonstrate How to Perform a Computer Forensics Investigation

Upon completion of this unit of instruction the student will be able to:

- 3.1 Describe the data to analyze in a computer forensics investigation
- 3.2 Explain which tools may be used to validate data
- 3.3 Discuss common data-hiding techniques
- 3.4 Describe methods of performing a remote acquisition
- 3.5 Describe the different types of graphics file formats
- 3.6 Define data compression
- 3.7 Explain how to locate and recover graphics files

San Joaquin Valley College

Course Outline

- 3.8 Describe how to identify unknown file formats
- 3.9 Explain the copyright issues surrounding graphics
- 3.10 Explain what a virtual machine is and how it functions
- 3.11 Describe the issues in conducting forensic examinations of virtual machines
- 3.12 Examine the procedures for performing an acquisition of a virtual machine
- 3.13 Describe how to use network forensic tools

Unit 4: Analyze Email and Mobile Devices

Upon completion of this unit of instruction the student will be able to:

- 4.1 Describe how email clients and servers function
- 4.2 Explain the role of email in forensic investigations
- 4.3 Describe tasks in investigating email incidents
- 4.4 Explain the use of email server logs
- 4.5 Describe email computer forensics tools
- 4.6 Compare the different types of mobile devices
- 4.7 Explain the procedures for performing mobile device forensics
- 4.8 Explain how to acquire data from cell phones and mobile devices

Unit 5: Protocols for the Forensics Professional

Upon completion of this unit of instruction the student will be able to:

- 5.1 Explain the protocols for giving testimony as an expert witness
- 5.2 Describe the guidelines for testifying in court
- 5.3 Explain the guidelines for testifying in depositions and hearings
- 5.4 Describe the procedures for preparing forensics evidence for testimony
- 5.5 Describe the different types of authentication credentials
- 5.6 Explain what single sign-on can do
- 5.7 List the account management procedures for securing passwords
- 5.8 Explain how ethics and codes apply to expert witnesses
- 5.9 Explain how other organizations' codes of ethics may apply to expert testimony
- 5.10 Describe ethical difficulties in expert testimony

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Technology
Program: Information Technology

Course Number:
Course Name: Advanced Systems Security
Total Semester Units: 4.0
Total Hours: 75
Theory/Lecture Hours: 45
Application/Lab Hours: 30
Externship/Clinical Hours: 0

Course Description:

This course is designed to provide the student with the knowledge and skills needed to administer and manage security systems on an advanced level. This course examines security theory and concepts, access control, telecommunications and network security, information security governance and risk management, software development security, cryptography, security architecture and design, operations security, business continuity and disaster recovery planning, compliance, and physical (environmental) security.

Supported Certifications:

Can lead to Systems Security Certified Practitioner (SSCP)

Prerequisites:

Security+, Network Security, Penetration Testing, Computer Forensics

Course Outcomes

Upon completion of this course the student will be able to:

1. Discuss information security and risk management concepts.
2. Explain the procedures for controlling access to information and information system functions.
3. Discuss how to secure software applications.
4. Explain the processes for business continuity and disaster recovery planning.
5. Discuss how cryptography can be used to secure data.
6. Examine issues surrounding regulatory compliance.
7. Explain security as it relates to operations.
8. Describe physical security procedures for securing environments and data.
9. Identify key aspects of security architecture and design.
10. Explain the risks associated with telecommunications.

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Risk Assessment and Access Control

Upon completion of this unit of instruction the student will be able to:

- 1.1 Describe how security can support the mission, objectives, and goals of the enterprise
- 1.2 Discuss risk assessment
- 1.3 Distinguish between qualitative and quantitative risk assessment
- 1.4 Discuss different risk treatment options
- 1.5 Explain security controls using the CIA triad
- 1.6 Discuss security governance, policies, and roles
- 1.7 Discuss different data classification and protection levels
- 1.8 Summarize the issues that surround personnel security
- 1.9 Discuss authentication methods
- 1.10 Define two-factor and biometric authentication
- 1.11 Discuss access control methodologies and methods, including LDAP, AD, RADIUS, TACACS, and Kerberos
- 1.12 Explain access control attacks, including buffer overflow, script injection, phishing, social engineering, and spoofing
- 1.13 Discuss concepts for access control, including types and categories of controls
- 1.14 Discuss the differences between penetration testing and vulnerability assessment

Unit 2: Application Security and Business Continuity

Upon completion of this unit of instruction the student will be able to:

- 2.1 Discuss the different types of applications, application models, and corresponding technologies.
- 2.2 Describe the threats against software applications, including buffer overflow, malware, input attacks, and backdoors.
- 2.3 Discuss the Software Development Life Cycle and how it can be used to secure software applications
- 2.4 Explain the use of authentication in applications.
- 2.5 Discuss how to secure data stored in databases and data warehouses.
- 2.6 Discuss the different types of disasters and how they can affect the enterprise
- 2.7 List the steps of creating a business continuity plan and disaster recovery plan
- 2.8 Discuss how to test business continuity plans and disaster recovery plans
- 2.9 Explain how to maintain business continuity plans and disaster recovery plans

San Joaquin Valley College

Course Outline

Unit 3: Cryptography and Security Compliance

Upon completion of this unit of instruction the student will be able to:

- 3.1 Define terminology used in cryptography science
- 3.2 List the different methods of encryption
- 3.3 Explain the types of encryption, including block ciphers and stream ciphers
- 3.4 Describe the different types of encryption keys
- 3.5 Define cryptanalysis and the different types of attacks on cryptographic systems
- 3.6 Explain how to manage cryptographic services
- 3.7 Discuss the computer crime laws and regulations of various nations
- 3.8 Define compliance
- 3.9 Discuss how to manage security incident response
- 3.10 Describe the steps in forensic procedures
- 3.11 Explain ethical issues as they relate to information assurance

Unit 4: Operational and Physical Security

Upon completion of this unit of instruction the student will be able to:

- 4.1 Define how to apply security operational concepts to an enterprise
- 4.2 Describe different administrative, management, and control security functions
- 4.3 Explain incident management
- 4.4 Define high availability architectures and how they can be used to provide security
- 4.5 Describe business continuity management, vulnerability management, change management, and configuration management
- 4.6 Explain the different operations attacks and countermeasures
- 4.7 Describe site access security strategies and controls
- 4.8 Explain theft protection, damage protection, and cabling protection
- 4.9 Define environmental controls and how they can be used to secure data

Unit 5: Security Architectures and Telecommunications Security

Upon completion of this unit of instruction the student will be able to:

- 5.1 Describe the different security models, including Bell-LaPadula, Biba, MAC, DAC, RBAC, and Clark-Wilson
- 5.2 Define information systems evaluation models and how they can be used.
- 5.3 List computer hardware architectures and threats against them
- 5.4 Define software security threats and countermeasures
- 5.5 Describe the major current telecommunications technologies being used
- 5.6 Explain different technologies used with local area networks, wide area networks, and wireless networks
- 5.7 Define network protocols
- 5.8 Summarize network authentication protocols
- 5.9 Describe attacks against networks and telecommunications
- 5.10 Explain different telecommunications countermeasures

San Joaquin Valley College

Course Outline

Instructional Strategy and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, manipulating hardware through real and virtual simulations, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

Information Technology Program

General Education Courses

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: ENG 121
Course Name: Composition and Reading – Part A
Total Semester Units: 3
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This is the first in a 2-part college level English course. In this course, students will learn the foundation of critically reading and writing in a variety of rhetorical modes. Students will read various essays and literature, and apply critical analysis to their own writing. Students will practice all aspects of the writing process, and by the end of Part B, they will meet a goal of writing a minimum of 6000 words through a variety of assignments.

Recommended Prerequisites: Completion of the Study Plan created through self-assessment in MyWritingLab in the Student Center

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Apply elements of the writing process, including planning, shaping, drafting, revising, and editing to create original compositions for various purposes and audiences
2. Write in a variety of rhetorical modes, which can include: narration, description, definition, cause-effect, comparison/contrast, and classification
3. Identify and critically evaluate the major ideas, themes, methods, and other features in college level essays and literature and apply to personal and professional writing
4. Apply the principles of APA formatting to various projects
5. Utilize various technology methods to effectively draft, review, revise and edit writing
6. Describe the connection between verbal and written communication and use these skills to present him/herself professionally
7. Apply conventions of English grammar, spelling, punctuation, and sentence structure to college-level writing

Grade Item Weights

- 17% Quizzes
- 50% Projects/Homework
- 33% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Principles of the Writing Process

Upon completion of this unit of instruction the student will be able to:

- 1.1 Explain and utilize planning, shaping, drafting, revising, and editing skills
- 1.2 Identify steps of the Writing Process by reading and analyzing literary examples
- 1.3 Utilize planning and shaping in writing
- 1.4 Demonstrate pre-writing techniques
- 1.5 Apply revising strategies to improve his/her own writing
- 1.6 Work in collaboration with peers in the revision process
- 1.7 Use electronic resources to revise and develop writing
- 1.8 Apply APA format to all types of writing assignments

Unit 2: Elements of a Complete, Coherent Essay

Upon completion of this unit of instruction the student will be able to:

- 2.1 Identify and utilize basic essay formats
- 2.2 Create effective introductions and conclusions
- 2.3 Describe the elements of a thesis and identify them in written examples
- 2.4 Construct accurate and thoughtful thesis statements and topic sentences
- 2.5 Create unity and coherence by using transitional techniques and phrases

Unit 3: Critical Reasoning and Analytical Reading

Upon completion of this unit of instruction the student will be able to:

- 3.1 Identify the need for planning, flexibility, and metacognition in the thinking process
- 3.2 Employ close reading techniques to discuss and evaluate various literary examples
- 3.3 Identify the differences between verbal and written communication and use these skills to present professional writing
- 3.4 Use analytical skills to connect written and verbal communication
- 3.5 Analyze and evaluate various rhetorical modes of communication
- 3.6 Apply critical analysis to personal and professional writing
- 3.7 Analyze and evaluate various writing with peers

Unit 4: Writing Skills

Upon completion of this unit of instruction the student will be able to:

- 4.1 Demonstrate correct use of grammar, spelling, punctuation, sentence structure and word choice in college level writing
- 4.2 Demonstrate effective use of description and detail
- 4.3 Write in a variety of rhetorical modes, such as narration, description, definition, argument, persuasion, exemplification, cause-effect, comparison/contrast, classification, and analysis
- 4.4 Edit and proofread personal writing with peers
- 4.5 Practice enough writing to meet end goal of 6000 words by the end of Part B

San Joaquin Valley College

Course Outline

Instructional Strategies and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: ENG 122
Course Name: Composition and Reading – Part B
Total Semester Units: 3
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course is the second portion of our college level English course. By building on the skills learned in Part A, students will continue to critically read and write in a variety of rhetorical modes. Students will read various essays and literature, and apply critical analysis to their own writing. In this course they will build information literacy skills through research, and describe the connection between effective communication and professionalism. Students will complete their goal of writing a minimum of 6000 words.

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Apply elements of the writing process, including planning, shaping, drafting, revising, and editing to create original compositions for various purposes and audiences
2. Write in a variety of rhetorical modes, which can include: argument, persuasion, exemplification, and analysis
3. Identify and critically evaluate the major ideas, themes, methods, and other features in college level essays and literature and apply to personal and professional writing
4. Incorporate principles of research, sources, and APA documentation into original writing
5. Demonstrate information literacy, including analytical use of an electronic environment, to effectively research
6. Describe the connection between verbal and written communication and use these skills to present him/herself professionally

Grade Item Weights

- 17% Quizzes
- 50% Projects/Homework
- 33% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Principles of the Writing Process

Upon completion of this unit of instruction the student will be able to:

- 1.1 Explain and utilize planning, shaping, drafting, revising, and editing skills
- 1.2 Identify steps of the Writing Process by reading and analyzing literary examples
- 1.3 Utilize planning and shaping in writing
- 1.4 Demonstrate pre-writing techniques
- 1.5 Apply revising strategies to improve his/her own writing
- 1.6 Work in collaboration with peers in the revision process
- 1.7 Use electronic resources to revise and develop writing

Unit 2: Elements of a Complete, Coherent Essay

Upon completion of this unit of instruction the student will be able to:

- 2.1 Identify and utilize basic and advanced essay formats
- 2.2 Create effective introductions and conclusions
- 2.3 Construct accurate and thoughtful thesis statements and topic sentences
- 2.4 Create unity and coherence by using transitional techniques and phrases

Unit 3: Critical Reasoning and Analytical Reading

Upon completion of this unit of instruction the student will be able to:

- 3.1 Identify the need for planning, flexibility, and metacognition in the thinking process
- 3.2 Employ close reading techniques to discuss and evaluate various literary examples
- 3.3 Identify the differences between verbal and written communication and use these skills to present professional writing
- 3.4 Use analytical skills to connect written and verbal communication
- 3.5 Analyze and evaluate various rhetorical modes of communication
- 3.6 Apply critical analysis to personal and professional writing
- 3.7 Analyze and evaluate various writing with peers
- 3.8 Analyze electronic research sources for quality

Unit 4: Writing Skills

Upon completion of this unit of instruction the student will be able to:

- 4.1 Demonstrate correct use of grammar, spelling, punctuation, sentence structure and word choice in college level writing
- 4.2 Demonstrate effective use of description and detail

San Joaquin Valley College

Course Outline

- 4.3 Write in a variety of rhetorical modes, such as narration, description, definition, argument, persuasion, exemplification, cause-effect, comparison/contrast, classification, and analysis
- 4.4 Edit and proofread personal writing with peers
- 4.5 Practice enough writing to meet end goal of 6000 words by the end of course

Unit 5: Academic Research and APA Documentation Skills

Upon completion of this unit of instruction the student will be able to:

- 5.1 Apply APA format to pieces of personal writing
- 5.2 Practice proper APA documentation of sources
- 5.3 Recognize and avoid plagiarism
- 5.4 Demonstrate information literacy by identifying appropriate sources for inclusion in academic research
- 5.5 Locate and identify appropriate sources for inclusion in academic research
- 5.6 Use research techniques to find information through electronic and print resources
- 5.7 Use research sources to support and defend ideas

San Joaquin Valley College

Course Outline

Instructional Strategies and Methods for Assessing Student Learning Outcomes:

1. Critical Thinking Tasks and Assignments:

Through discussions, individual and group presentations, written assignments, and research papers and projects, students will demonstrate critical thinking skills and problem solving abilities that meet the standards outlined by the Student Learning Outcomes for this course. Each instructor must maintain an instructor portfolio with examples of all required assignments and activities.

2. Required Reading, Writing, Projects, and Outside of Class Assignments:

Each instructor must maintain a listing of all homework assignments including reading assignments, writing assignments, and projects.

3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

The evaluation of student performance is based on the scores received on quizzes, homework assignments, projects, skill performance, and objective examinations. All scores earned are converted to a percentage of the total scores possible within each course. The final grade in each course is determined by the percent ranges converted to the letter grade shown in the chart below.

90	-	100%	=	A
80	-	89%	=	B
70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: MTH 121
Course Name: College Algebra – Part A
Total Semester Units: 3.0
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course integrates technology with mathematics through the use of online learning resources, and covers the fundamentals and terminology of algebra. Topics include real numbers, complex numbers, order of operations, ratios/proportions, single and multiple step linear equations and inequalities, use of formulas, algebraic expressions, polynomials, systems of equations, graphing and quadratic equations. Students will utilize the metric and U.S. standard systems, and scientific notation. The fundamentals and terminology of Geometry, including geometric shapes and the Pythagorean Theorem, will be provided. This course offers hands-on applications that allow students to relate to and to apply concepts to their field of study.

Recommended Prerequisites: Completion of the Study Plan created through self-assessment in MyMathLab in the Student Center

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Interpret mathematical and algebraic terminology and simplify algebraic expressions
2. Solve algebraic equations and formulas
3. Solve and graph linear equations and inequalities
4. Evaluate and factor polynomials
5. Solve systems of equations with two and three variables using multiple methods
6. Apply appropriate algebraic methods and operations to solve problems commonly associated with the student's profession

Grade Item Weights

- 25% Quizzes
- 35% Projects/Homework
- 40% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Terminology

Upon completion of this unit of instruction the student will be able to:

- 1.1 Define the properties of real numbers - the set and subsets of real numbers:
 - a. Whole numbers
 - b. Integers
 - c. Natural numbers
 - d. Rational numbers
 - e. Irrational numbers
- 1.2 Define algebraic expressions, equations, terms, and coefficients
- 1.3 Apply methods of translating algebraic expressions and equations
- 1.4 Combine like terms
- 1.5 Perform operations involving bases and integer exponents
- 1.6 Define terminology associated with geometry to determine perimeter, area, surface area, circumference and volume of geometric shapes
- 1.7 Convert between standard form and scientific notation

Unit 2: Equations, Formulas, and Expressions

Upon completion of this unit of instruction the student will be able to:

- 2.1 Utilize substitution to evaluate equations and expressions
- 2.2 Utilize the addition and multiplication principles to solve single and multiple step linear equations and formulas
- 2.3 Determine if an equation has no solution or is an identity
- 2.4 Solve absolute value equations
- 2.5 Use formulas to determine perimeter, area, surface area, circumference and volume of geometric shapes

Unit 3: Graphing

Upon completion of this unit of instruction the student will be able to:

- 3.1 Recognize and interpret the slope, x-intercept, and y-intercept of a line
- 3.2 Use standard, slope-intercept, and point-slope equations of a line to identify and to solve for slope, x- and y-intercepts of linear equations
- 3.3 Use the graph of a line to identify its slope, x- and y-intercepts and/or to determine the equation of the line
- 3.4 Recognize horizontal and vertical lines and their slopes
- 3.5 Graph a linear equation and linear inequalities

San Joaquin Valley College

Course Outline

Unit 4: Polynomials

Upon completion of this unit of instruction the student will be able to:

- 4.1 Add, subtract, multiply and divide polynomials
- 4.2 Find the greatest common factor of a polynomial
- 4.3 Identify the components and differentiate the features of various polynomials
- 4.4 Use various methods to factor polynomials

Unit 5: Systems of Equations with Two and Three Variables

Upon completion of this unit of instruction the student will be able to:

- 5.1 Classify systems of linear equations
- 5.2 Solve systems of linear equations by graphing, substitution, and elimination

Unit 6: Mathematical Models

Upon completion of this unit of instruction the student will be able to:

- 6.1 Utilize concrete, situational data to create abstract mathematical models related to the real world
- 6.2 Evaluate ratios/proportions and perform dimensional analysis to carry out unit conversions and solve applied problems
- 6.3 Use basic geometry to solve design problems
- 6.4 Relate mathematical functions to career situations

San Joaquin Valley College

Course Outline

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a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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70	-	79%	=	C
65	-	69%	=	D
Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: MTH 122
Course Name: College Algebra – Part B
Total Semester Units: 3.0
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course integrates technology with mathematics through the use of online learning resources, and covers the fundamentals and terminology of algebra. Topics include use of formulas, algebraic expressions, polynomials, systems of equations, exponential and logarithmic expressions and quadratic equations. Students will utilize rational and radical expressions, conics and functions. This course offers hands-on applications that allow students to relate to and to apply concepts to their field of study.

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Interpret mathematical and algebraic terminology
2. Solve algebraic equations and formulas, and simplify algebraic expressions
3. Evaluate and factor polynomials
4. Solve problems involving exponential and logarithmic expressions
5. Simplify rational and radical expressions
6. Use the rectangular coordinate system to graph and identify conics
7. Solve and evaluate functions
8. Apply appropriate algebraic methods and operations to solve problems commonly associated with the student's profession

Grade Item Weights

- 25% Quizzes
- 42% Projects/Homework
- 33% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Terminology

Upon completion of this unit of instruction the student will be able to:

- 1.1 Define the properties of real numbers - the set and subsets of real numbers:
 - a. Whole numbers
 - b. Integers
 - c. Natural numbers
 - d. Rational numbers
 - e. Irrational numbers
- 1.2 Define properties of complex numbers
- 1.3 Define algebraic expressions, equations, terms, and coefficients
- 1.4 Apply methods of translating algebraic expressions and equations

Unit 2: Equations, Formulas, and Expressions

Upon completion of this unit of instruction the student will be able to:

- 2.1 Utilize the addition and multiplication principles to solve single and multiple step linear equations and formulas
- 2.2 Determine if an equation has no solution or is an identity
- 2.3 Utilize substitution to evaluate equations and expressions
- 2.4 Combine like terms
- 2.5 Perform operations involving bases and integer exponents
- 2.6 Solve absolute value equations

Unit 3: Polynomials

Upon completion of this unit of instruction the student will be able to:

- 3.1 Add, subtract, multiply and divide polynomials
- 3.2 Find the greatest common factor of a polynomial
- 3.3 Classify polynomials into monomials, binomials, trinomials
- 3.4 Use various methods to factor polynomials
- 3.5 Identify and factor special products of perfect trinomial squares and differences of squares
- 3.6 Solve quadratic equations by factoring, completing the square, and using the quadratic formula

San Joaquin Valley College

Course Outline

Unit 4: Logarithms

Upon completion of this unit of instruction the student will be able to:

- 4.1 Simplify logarithmic expressions by using the properties of logarithms
- 4.2 Convert between logarithmic form and exponential form

Unit 5: Rational and Radical Expressions

Upon completion of this unit of instruction the student will be able to:

- 5.1 Find equivalent rational expressions
- 5.2 Simplify complex fractions
- 5.3 Multiply, divide, add, and subtract rational and radical expressions
- 5.4 Convert between radical and exponential form
- 5.5 Use the properties of exponents to simplify rational exponents
- 5.6 Simplify radical expressions

Unit 6: Conics

Upon completion of this unit of instruction the student will be able to:

- 6.1 Define and graph a circle, ellipse, hyperbola, and parabola
- 6.2 Identify the special points and lines for a circle, ellipse, hyperbola, and parabola
- 6.3 Derive appropriate equations of a circle, ellipse, hyperbola, and parabola when given the special points

Unit 7: Functions

Upon completion of this unit of instruction the student will be able to:

- 7.1 Determine if an equation is a function
- 7.2 Identify domain and range of functions
- 7.3 Graph functions using a table of solutions

San Joaquin Valley College

Course Outline

Instructional Strategies and Methods for Assessing Student Learning Outcomes:

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3. Methods to Measure Achievement of Student Learning Outcomes:

Students in this course will be graded in the following categories:

a) Writing Assignments:

- Written homework
- Research papers
- Term or other papers

b) Computational or Non-Computational Problem Solving Demonstrations:

- Exams
- Homework problems
- Quizzes

c) Skill Demonstration:

- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

- Multiple choice
- Matching items
- Fill-in-the-blanks
- Essays
- Short answer
- True or false

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Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: PSY 1
Course Name: General Psychology
Total Semester Units: 3.0
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0

Course Description:

This course covers the study of human behavior, moral development, and psychological theory as it applies to the individual, group, and community. Behavioral disorders and treatment; social perceptions; emotions and motivation, social influence and group processes are topics included in this course.

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Discuss the history and founders of the field of psychology as well as the major contributors to psychology and their theories
2. Contrast theories of behaviorism, cognition, psychoanalysis, and humanism with regard to abnormal behavior, psychotherapy, motivation, emotion, learning, development, and personality
3. Evaluate and explain the biological basis of behavior and heredity and how they interact with the environment to influence behavior and development
4. Distinguish assessment tools and analyze research techniques used in psychology
5. Apply psychological concepts such as motivation, emotion, learning, and personality to areas commonly associated with the student's own professional goals

Grade Item Weights

- 17% Quizzes
- 50% Projects/Homework
- 33% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: History of Psychology

Upon completion of this unit of instruction the student will be able to:

- 1.1 Recognize the founders of the field of psychology
- 1.2 Summarize the specialized fields within psychology

Unit 2: Biological Foundation

Upon completion of this unit of instruction the student will be able to:

- 2.1 Identify the specialized functions of the brain
- 2.2 Identify the sense organs and explain their functions
- 2.3 Summarize research on the effects of heredity and environment on human behavior

Unit 3: Psychological Theories

Upon completion of this unit of instruction the student will be able to:

- 3.1 Describe the principles and techniques of classical and operant conditioning
- 3.2 Explain the different theories of memory
- 3.3 Identify various theories of personality
- 3.4 Summarize various theories of emotion and motivation
- 3.5 Describe research into sleep, dreaming, and altered states

Unit 4: Developmental Psychology

Upon completion of this unit of instruction the student will be able to:

- 4.1 Discuss theoretical concepts of physical, cognitive, emotional, and moral development
- 4.2 Summarize major theories of socialization
- 4.3 Describe changes in development from infancy through adolescence and adulthood and into old age

Unit 5: Breakdown and Therapy

Upon completion of this unit of instruction the student will be able to:

- 5.1 Identify sources of stress and strategies for coping with stress
- 5.2 Distinguish between normalcy and abnormality
- 5.3 Identify behaviors classified as neurosis and those classified as psychosis
- 5.4 Describe substance abuse
- 5.5 Explain the difference in various forms of therapy, including psychoanalysis, behavioral, humanistic, group, organic

Unit 6: Psychological Testing and Research Methodology

Upon completion of this unit of instruction the student will be able to:

- 6.1 Identify different kinds of psychological testing such as personality and I.Q.
- 6.2 Explain different research methods
- 6.3 Define validity and reliability

San Joaquin Valley College

Course Outline

Instructional Strategies and Methods for Assessing Student Learning Outcomes:

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- Individual and group presentations
- Performance exams
- Skill competencies
- Case studies

d) Objective Examinations:

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San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: SOC 1
Course Name: Introduction to Sociology
Total Semester Units: 3.0
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course is a survey of social structure, theory, and its implications for individuals in a dynamic view of the environment. Cultures, family, organizations, groups, ethnic and political influences, and politics are the topics covered.

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Discuss the concepts, theories, elements and perspectives of Sociology
2. Analyze the methods and results of social control, social structure, and stratification
3. Discuss the impact and process of socialization in connection with the student's own life
4. Explain the theories, elements, and characteristics of culture
5. Integrate the function and impact of media on personal and global culture
6. Relate sociological concepts to aspects commonly associated with everyday interaction with people and groups

Grade Item Weights

- 17% Quizzes
- 50% Projects/Homework
- 33% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Culture

Upon completion of this unit of instruction the student will be able to:

- 1.1 Define sociology
- 1.2 Summarize the major contributions of classical sociologists
- 1.3 Compare functionalist, conflict, interactionist, and feminist theory
- 1.4 Define and explain the characteristics of culture
- 1.5 Identify subcultures and counter cultures

Unit 2: Socialization

Upon completion of this unit of instruction the student will be able to:

- 2.1 Define the concept of self
- 2.2 Define socialization
- 2.3 Define and explain re-socialization
- 2.4 Explain and identify social interaction
- 2.5 Illustrate and identify the agents of socialization

Unit 3: Media

Upon completion of this unit of instruction the student will be able to:

- 3.1 Explain and identify the influence of mass media from the various sociological perspectives
- 3.2 Discuss and illustrate the role of audience
- 3.3 Identify the characteristics of the Global Media

Unit 4: Social Control and Stratification

Upon completion of this unit of instruction the student will be able to:

- 4.1 Define Social Control
- 4.2 Define Deviance
- 4.3 Explain systems of stratification: global, domestic, gender, and age
- 4.4 Identify and discuss social class and social mobility
- 4.5 Explain social inequality involving the relationship between prejudice and discrimination
- 4.6 Explain the effects of globalization in regards to social movement and social change

Unit 5: Social Structure, Groups, and Organizations

Upon completion of this unit of instruction the student will be able to:

- 5.1 Identify and explain the elements of social structure, groups, and organizations
- 5.2 Explain the importance of social institutions and social organization
- 5.3 Explain the functions and structures of the family
- 5.4 Discuss the basic elements of religion and various religious organizations
- 5.5 Discuss the effect of population growth on the global economy

San Joaquin Valley College

Course Outline

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Below		65%	=	F

San Joaquin Valley College

Course Outline

Division: Business, Health, & Technical Studies
Program: General Education

Course Number: NSC 1
Course Name: Introduction to the Natural Sciences
Total Semester Units: 3.0
Total Hours: 45
Theory/Lecture Hours: 45
Application/Lab Hours: 0
Externship/Clinical Hours: 0

Course Description:

This course presents an overview of the basic concepts of the natural sciences, emphasizing biology, chemistry, physical, earth and space science. These concepts are taught both as a technical foundation and from a historical perspective. The subject matter is integrated into lecture discussions covering the environment, ecology, and the relevance of natural science to human affairs. Subjects discussed include current and relevant social, scientific and economic issues. Special projects and activities may be required.

Course Learning Outcomes

Upon completion of this course, the student will be able to:

1. Demonstrate the basic principles of biology and relate them to practical applications
2. Identify the essential roles and properties of chemistry as it occurs in the natural world
3. Describe the general rules of physics and apply them to the world around us
4. Demonstrate knowledge of astronomy when examining the organization and composure of the universe
5. Describe and identify the basic principles of geology and environmental science, as well as how they apply to the world
6. Utilize the scientific method and evaluate conclusions drawn from scientific data
7. Discuss and explain the interrelationships between the branches of science
8. Apply scientific principles to the student's chosen profession

Grade Item Weights

- 17% Quizzes
- 50% Projects/Homework
- 33% Exams

San Joaquin Valley College

Course Outline

Unit Objectives

Unit 1: Introduction to Scientific Literacy, Method & Philosophy

Upon completion of this unit of instruction the student will be able to:

- 1.1 Define science, explain the scientific method, identify the common branches of the natural sciences, and relate the importance of ethics in scientific disciplines
- 1.2 Relate the major historical developments in natural science, and explain the effects on society

Unit 2: Chemistry Fundamentals

Upon completion of this unit of instruction the student will be able to:

- 2.1 Explain the fundamental concepts of chemistry including:
 - 2.1.1 Atomic structure
 - 2.1.2 Periodic table and properties of matter
 - 2.1.3 Chemical bonding and molecular structure
 - 2.1.4 Acid/base
 - 2.1.5 Oxidation – Reduction
 - 2.1.6 Radioactivity
 - 2.1.7 Organic and biochemistry

Unit 3: Classical Physics

Upon completion of this unit of instruction the student will be able to:

- 3.1 Describe the basic concepts of classical physics, including mechanics, energy, work, power, heat, sound, magnetism, gravity, and light

Unit 4: Astronomy and Cosmology

Upon completion of this unit of instruction the student will be able to:

- 4.1 Describe the theories explaining the formation of stars and planets, and the life of a star
- 4.2 Explain the concept of the Big Bang Theory, the formation of matter, and the methods used by scientists to study these theories

Unit 5: Biological, Ecology and Environment Science

Upon completion of this unit of instruction the student will be able to:

- 5.1 Explain the basic principles of biology including:
 - 5.1.1 Cell structure and physiology
 - 5.1.2 Cell diversity and specificity
 - 5.1.3 Classification of organisms and bio-diversity
 - 5.1.4 Growth and reproduction
 - 5.1.5 Structure and function of DNA and RNA

San Joaquin Valley College

Course Outline

- 5.1.6 Microbiology and disease
- 5.2 Discuss the theories relating to the development and evolution of life on earth
- 5.3 Define and explain the ecology of the earth including:
 - 5.3.1 Biomes
 - 5.3.2 Ecological balance
 - 5.3.3 Food cycles
 - 5.3.4 Biological competition
 - 5.3.5 Effects of natural and man-made changes to the environment
- 5.4 Relate importance of nutrition to a healthy lifestyle
- 5.5 Discuss function of protein, carbohydrates and lipids, including importance of vitamins and minerals

Unit 6: Earth Science

Upon completion of this unit of instruction the student will be able to:

- 6.1 Explain the basic geology of the earth including geologic evolution, water and the oceans, the continents and plate tectonics
- 6.2 Relate the application of natural sciences to modern technology, assessments of risks and benefits and the problems and potential problems of certain technology:
 - 6.2.1 Medicine and Human Health
 - 6.2.2 Genetic Engineering
 - 6.2.3 Energy
 - 6.2.4 War and Weapons
 - 6.2.5 Electronics & Computers
 - 6.2.6 Pollution
 - 6.2.7 Atmosphere
 - 6.2.8 Ozone Layer
 - 6.2.9 Greenhouse Effect
 - 6.2.10 Acid Rain

San Joaquin Valley College

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