Course Syllabus

Home Department

Web Design & Development B.S.

Course Name

Networks and Server Structures

Contact Information

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| **Catalog Course Code:** | **WDD 331** |
| **Three-Letter Course Abbreviation:** | **NSS** |
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Course Description

The Networks and Server Structures Course explores computer operations, networking, and information security. Students examine common operating systems and their configuration, networked environments, and Information security concepts. This course presents knowledge about data availability, integrity and confidentiality, access control, project planning & software development lifecycles, standards and best practices.

Course Materials

Web Commerce Security Design and Development By: Hadi Nahari; Ronald L. Krutz

Course Objectives

Course objectives are typically what students will learn at the end of a unit of study. These differ from course outcomes, which are what students will be able to know or do at the end of a course.

Provide the students with your course objectives and link them to the milestones that will support and demonstrate their achievement. The milestones are entered as secondary bullets beneath each objective. This sample objective will be accomplished through the following milestones (or student tasks):

Through the various components of study and application, students will realize these objectives

* Operating systems
* Networking concepts
* Server configuration
* Information security and information security organizations
* Project planning and Software development lifecycles
* Standards and standards organizations

Course Outcomes

By the end of this course, students will be able to:

* Install and configure a Linux operating system in a virtual environment.
* Discuss networking concepts including the TCP/IP suite of protocols
* Understand the function of various network hardware components
* Know common application security vulnerabilities and techniques to prevent them.
* Be able to research future and potential security vulnerabilities within their web applications
* Know how to use a command line interface
* Know how to develop operating system process automation
* Understand the purpose and function of a web server
* Understand basic network security concepts
* Be able to discuss common software project approaches

General Education Component

General Education classes that precede NSS should provide a solid base for the specific knowledge students will gain in this class. Communication, analytical and professional skills are honed in this component of their educations and students should also be developing their ability to think critically and solve problems.

Degree Connection

In Networks and Server Structures students will gain skills that will serve them in future courses. The ability to think critically, logically and solve problems will be very important as students move on. The development of applications which not only achieve the technical requirements but also do so without exposing clients to future liability/data spillage is mandatory not only in all subsequent classes but throughout the student’s future.

Industry Connection

NSS will expose students to topics and terminology that they will encounter later on in their industry. Understanding the relationship between clients and servers is extremely important in the web development. Understanding basic network infrastructure and protocols will help with application and back-end development. The skills taught in this class will enable students to connect and interact with servers. Understanding the role of security as an essential portion of any application project is essential in the industry.

Research Component

There’s no way to teach everything there is to know about networking in one month. This class will teach the basics upon which the student can build their knowledge using personal research and study through alternate means. During the course students will be expected to use the Internet for research in addition to the provided course materials when working on assignments. Further students are required to perform a vulnerability research project using industry best practices to find resolutions to common vulnerabilities found in the wild.

Additional Resources

The following books and publications are great resources to further your education in the networking industry.

* Web Commerce Security Design and Development By: Hadi Nahari; Ronald L. Krutz
* Lynda.com
* youtube.com

Topics Covered

* Modern Operating Systems
* Terminal Commands
* BASH Scripting
* Network Terminology
* Addressing
* Domain Name System
* Network Hardware
* OSI Model
* Network Protocols (TCP/IP)
* File Systems
* Servers
* FTP
* LAMP
* Security
* Virtualization & Cloud Computing

Learning Activities

Projects

Vulnerability research project- Students will use library resources and online databases to research common vulnerabilities in order to gain exposure into the process of vulnerability research and the impact of that impact on their professional and technical development. Students will produce documentation describing the historical impact of vulnerabilities, their technical specification and the mitigation steps required to both fix and prevent these vulnerabilities in their systems.

Lab 1

Student will install and configure a web server. This will expose students to administration tasks such as operating system installation, software installation & configuration through the command line and installation of virtualized servers.

Lab 2

Students will utilize bash shell scripting to perform administrative tasking creating, moving and deleting files and directories, assigning permissions to server objects.

Lab 3

Students use the terminal to update current software and learn the basics of documenting these changes.

Lab 4

Students will examine & analyze server log data in order to address common development tasks by answering key questions about the log data.

Lab 5

Students will use the server scheduling process to create log rotations tasks.

Lab 6

Students practice converting data decimal system to both hexadecimal and binary systems.

Lab 1-6 Rubrics

Each question or task is worth 10 points.

10 The assignment is complete and correct.

7 The assignment is mostly correct but contains a minimum of mis-configurations/errors.

5 The assignment is mostly correct but contains many of mis-configurations/errors.

2 The assignment functions (performs required actions) but serious configuration/errors.

0 The assignment does not perform as expected.

Grade Weights

Lab Projects 25%

Research Project 5%

Quizzes 5%

Exams 55%

GPS 10%

Strategies for Successful Learning

As with any class, taking notes, asking questions, and participating during lecture are invaluable learning tools for every student.

Students are encouraged to explore other applications of what is taught in class and how it can be applied to the technology they are currently using every day.