Overall

Total 6 months (24 weeks)

16 Weeks of in-class Work

4 Weeks of final projects

4 Weeks of Externship

Week 1

Intro to Systems

* What do servers do?
* How do they do it?
* What is the role of a system administrator
* Servers (physical hardware vs server software)

Intro to Networking

* How do machines talk?
* How do machines use IPs and Ports?
* How can multiple server programs run on a single machine
* CIDR Notation
* Basic IP and routing
* Subnets, broadcasts, switches vs routers

Basic Permissions

* Read, Write, Execute, Delete
* Applying permissions in windows
* Permission groups vs users
* Deny vs Allow
* Ownership

Intro to Command Line

* Powershell basics
* Folders – navigating, creating, deleting
* Files – create, delete, list
* Basic powershell commands
* Specific powershell commands
  + Set networking info
  + Set computer info
  + Set file info
* Reading/Writing text files
* Powershell profiles

Week 2

Basic Networking and DNS

* Routing outside the network
* Naming systems and DNS
* WINS (heh)
* Network to network routing
* Subnetting, CIDR, /notation, more
* Routing, Gateways, touch on BGP
* How multiple computers get to the internet behind a single IP (NAT)

Setup and use of Microsoft DNS

* Setup MS DNS
* DNS Tree Structures
* Primary vs Secondary domain

Microsoft File Shares

* Set up file shares
* File share permissions
* Hidden vs Visible file shares

Basic Network Security/Firewalls

* Port blocking/allow
* NAT/PAT
* Setup of NAT/PAT rules
* Setup of Port forwarding rules
* Port translation
* External vs Internal Port Mapping
* UPnP

Week 3

Basic Active Directory

* What is a domain
* Central control vs per-machine
* Replication, Domain Controllers, Topology
* Security in an AD Domain

Active Directory and AD User Administration

* ADUC Basics
  + Create users
  + Create groups
  + Create OU to organize users/groups
* Computer Objects in AD – Why
* AD Domains Administration
  + Sites, Domains

Intro to Group Policy

* Creating Basic GPOs
* What can GPOs Do?
* Computer vs User GPOs
* Checking which GPOs have been applied
* Log in scripts
  + Map drives on login

Basic IIS hosting

* What is IIS
* What is web hosting in general
* How does IIS host websites with code
* Permissions needed in IIS
* Site Creation
* Logs

Week 4

Intro to relational databases

* What are Databases
* How do they work
* SELECT, INSERT, UPDATE, DELETE
* Examples of use

SQL Install and Administration

* Server Topology and Setup (drives, memory, cpu, more)
* SQL Install
* SQL Server Management Studio Walkthrough
* Setting up Databases
* Permissions in SQL
* SQL vs Windows Permissions
* Permissions in SQL vs Permissions of SQL Server Service

Backups (Hallengren scripts)

* Intro to backups
  + Recovery vs Rollback
  + Long term vs short term
* Hallengren Scripts in SQL
  + Backup scheduling
  + Types of backups
  + Dealing with backups that are created
* Backup Plans in general
  + Making a plan

Week 5

Intro to Email

Exchange Install and Administration

Activesync

Exchange Backups

Week 6

Troubleshooting/monitoring in Windows

Windows Logging

Event Viewer

REPL Admin and other AD tools

Week 7

Intermediate Powershell

Setting up a Windows Environment

WSUS

Week 8

Installing and Configuring in Linux

Vi/emacs crash course (some nano too)

Users and permissions in Linux

“Not everything needs 777”

Week 9

Apache/NGINX – webhosting in Linux

MySQL – DBs in Linux

Linux DNS

Week 10

SendMail

Postgres – Using other DBs in Linux

Troubleshooting and monitoring in Linux

Week 11

Intro to containers (using linux)

Docker

Managing containers

Desired configurations

Week 12

Intermediate Containers

Building Containers

Sharing Containers

Scripting (with and without containers)

Week 13

Virtualization Concepts and basic usage

Shared Storage/ISCSI usage

HyperV/VMWare

VM Images

Virtual Networks

Week 14

VM Management and Administration

VM Host design/configuration

Week 15

Azure Basics

VMs in Azure

Creating other services

Week 16

OpenStack use and administration

Final Projects

Linux (2 Weeks):

* Create an OpenStack environment using VMWare/HyperV/KVM as the virtualization back end
* Include security and front end administration modules
* Allow for multi-tenant hosting
* Install Gitlab/Wordpress into hosted environment to verify functionality
* Create download/webcache using NGINX

Test functionality

* Openstack administration site loads, has two separate users available with separate machines/domains/spaces
* Gitlab/Wordpress site hosted in openstack loads
* Users using the webcache can download from sites faster after initial load (tests can be steam/gog or windows updates, other sites)

Windows (2 Weeks):

* Using the OpenStack environment from above do the following
* Setup a 2 site domain
* Setup Desktop deployment in the domain using WDS
* Use GPOs for user/desktop configuration
* Create an Exchange server for mail hosting, including activesync
* Install an IIS website that requires SQL (install SQL as well)
* Create a backup plan

Test functionality

* PXE Boot to install OS
* Login with domain user
* Send/receive email with mobile device
* Verify that website loads
* Verify GPO settings (IE branding, background picture, whatever)