**Program: System Engineering**

Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption. Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. Assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. Supervise computer user support specialists and computer network support specialists and administer network security measure.

**Program Objective:** This will enable students to prepare for networking related positions such as Systems Administrator, Systems Engineer, Network Engineer, Network Manager, and IT Technology Manager. In this program, students will study how to build, maintain, and monitor LAN, WAN, and other segment of network systems. This program covers courses on Windows Server Administration, Active Directory Administration, Virtualization, VMware Management, Linux System Administration, Cisco Switches, Router configuration, Network Cyber Security, CCNA and AWS and Azure Cloud Security. Students will prepare for DevOps certification and learn Jenkins, Puppet, Nagios, Docker, Kubernetes, PowerShell, GIT and Linux Shell Programming. The program includes ample labs, quizzes, group discussions/ exercises, project work and internal/ external internship opportunities.

**Admission Requirements:**

* GED Credit or high School credit or college Diploma
* Basic English Communication Skill
* Basic Computer Skills with prior Computer Experience
* Apply for the program enrollment before the enrollment date
* Provide application supporting data: Driver License, Transcript, Experience Letter, Recommendation Letter
* Pay the program cost or provide Training cost voucher

**Material:** Textbook, Instructor Notes, Source code for projects.

**Evaluation:**

* Evaluation of project completed in the classroom, 40%
* Home assignments 20%
* Project 40%

**Length of Program / Program Duration:** 55 Weeks/ 550 Hours (10 hrs. per week - Theory/Labs/Practice/ In-Class and Simulation Exam)

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| --- |
| **Institutional Calendar (Program Start and End Date):** |
| **Quarter** | **Dates** | **Events** |
| **Fall 2020** | Wednesday, September 30 | Fall Quarter Begins |
| Thursday, November 26 | Thanksgiving Break |
| Saturday, December 12 | Program Completion Celebration |
| Friday, December 11 | Fall Quarter Ends |
| Monday, December 14 – Saturday, December 26 | Program / Course Evaluations |
|   |   |   |
| **Winter 2020** | Monday, January 6 | Winter Quarter Begins - Program Orientation Day |
| Monday, January 20 | Martin Luther King, Jr. Day |
| Friday, March 20 | Winter Quarter Ends |
|   |   |   |
| **Spring 2020** | Monday, March 30 | Spring Quarter Begins |
| Monday, May 25 | Memorial Day |
| Saturday, June 06 | Program Completion Celebration |
| Friday, June 12 | Spring Quarter Ends |
| Monday, June 15 – | Program / Course Evaluations |
| Friday, June 19 |
|   |   |   |
| **Summer 2020** | Monday, June 22 | Summer Quarter Begins - Program Orientation Day |
| Saturday, July 4 | Independence Day Holiday |
| Friday, August 21 | Summer Quarter Ends |
|   |   |   |
| **Fall 2021** | Wednesday, September 30 | Fall Quarter Begins |
| Thursday, November 26 | Thanksgiving Break |
| Saturday, December 12 | Program Completion Celebration |
| Friday, December 11 | Fall Quarter Ends |
| Monday, December 14 – Saturday, December 26 | Program / Course Evaluations |

**Fees Structure:**

* Tuition – $8000
* Books/Software/ Supplies – $800
* Certifications/Tests – $1200 (AWS, Linux, and CCSK)

**REFUND / CANCELLATION POLICY**

1. A full refund against the tuition and fees or a credit in a comparable amount against future tuition and fees will be offered to students, who are called for active duty or active service. A full flexibility for re- enrollment and re-application will be offered to these students.
2. For students who cancel their classes from the institution maybe eligible for tuition and fee refund based on the following refund table below:

Student must make a written request for the withdrawal and request for the refund. If a student has attended the classes in person or on web or missed the classes prior to the formal request, then these weeks counts will be considered as student has taken the classes and these number of weeks will be used in determining the refund amount.



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If there is a billing balance or outstanding balance, the student may still be liable for unpaid institutional costs as well as any non-institutional costs. The school may deduct an administrative fee $100 from the amount of the total refund.

**NOTICE TO STUDENT**

* IT Expert System, Inc. is approved to operate by the Private Business and Vocational Schools Division of the Illinois Board of Higher Education.
* IT Expert System, Inc. is not accredited by a US Department of Education recognized accrediting body.
* The school does not guarantee transferability of credit and that in most cases, credits or coursework are not likely to transfer to another institution.
* COMPLAINTS IF ANY AGAINST THIS INSTITUTION MAY BE REGISTERED WITH THE BOARD OF HIGHER EDUCATION, 1 N Old State Capitol Plaza, Suite# 333, Springfield, IL 62701. The link to the IBHE is [www.ibhe.org](http://www.ibhe.org) and the complaints link is [www.complaints.ibhe.org](http://www.complaints.ibhe.org).

**STUDENT DATA:**

|  |  |  |
| --- | --- | --- |
| **Program** | **Particulars** | **Numbers** |
| System Engineering | Total students enrolled | 9 |
| New starts | 7 |
| Transferred out of program | 0 |
| Graduated/Completed | 6 |
| Placed in field of study | 5 |
| Placed in related field | 0 |
| Not available for placement due to personal reasons | 1 |
| Govt/Certification taken/passed | NA |
| Student not placed by IT Expert System | 0 |

**\*\*Approximate salary ranges from 60K – 120K**

**Module 1: Linux System Administration**

**Overview:** Linux administration course teaches students how to install, configure and maintain a Linux system in a networked environment. Students will learn to perform basic administrative tasks such as adding and managing users, creating and maintaining file systems, developing and implementing a security policy, and performing software installation and package management, course also includes installing and supporting SSH, NFS, Samba, DNS, DHCP, and the Apache Web server

**Course Content**

* Installing a Linux operating system and configuring peripherals
* Performing and modifying startup and shutdown processes
* Setting up and maintaining basic networking
* Populating the system with users and groups
* Setting specific file permissions on directories and regular files
* Performing maintenance on file systems
* Managing running processes
* Automating daily tasks
* Performing backups and restoration of files
* Troubleshooting system problems
* Analyzing and taking measures to increase system performance
* Working with the X Windows interface
* Configuring networked file systems
* Deploying a working Apache Web server configuration
* Securing Servicers
* Process optimization
* Sharing files with a Windows SMB protocol
* Configuring DHCP services
* Configuring DNS services
* Implementing security measures
* Python Programming
* Shell Programming
* EC2 cloud Instance management

**Module 2: Physical Networking**

 **Overview:**This course is an introduction to the world of networking personal computers. It focuses on configuring, managing, and troubleshooting elements of the basic network infrastructure.

**Course Content:**

* Identify basic networking concepts, including how a network works. Content should include network access, protocol, network interface cards, full duplex, cabling twisted pair, coaxial, fiber optic.
* Identify procedures for swapping and configuring network interface cards.
* Identify the ramifications of repairs on the network. Content should include reduced bandwidth, loss of data, network slowdown.
* Identify the networking capabilities of DOS and Windows including procedures for connecting to the network. Identify concepts and capabilities relating to the Internet and basic procedures for setting up a system for Internet access. Content should include TCP/IP, E-mail, html, http, ftp, domain names (Web sites), ISP, and dial-up access.
* Summarize the basics of networking fundamentals, including technologies, devices and protocols
o Basics of configuring IP addressing and TCP/IP properties (DHCP, DNS)
o Bandwidth and latency
o Status indicators
o Protocols (TCP/IP, NETBIOS)
o Full-duplex, half-duplex
o Basics of workgroups and domains
o Common ports: HTTP, FTP, POP, SMTP, TELNET, HTTPS
o LAN / WAN
o Hub, switch and router
o Identify Virtual Private Networks (VPN)
o Basics class identification

• Categorize network cables and connectors and their implementations
o Cables
o Plenum / PVC
o UTP (e.g. CAT3, CAT5 / 5e, CAT6)
o  STP
o  Fiber
o  Coaxial cable

* Connectors

 o RJ45
 o RJ11

* Compare and contrast the different network types
	+ Broadband
	+ DSL
	+ Cable
	+ Satellite

**Module 3: Active Directory Administration**

**Overview:** In this course, student will learn how to better manage and protect data access and information, simplify deployment and management of your identity infrastructure, and provide more secure access to data. You will learn how to configure some of the key features in Active Directory such as Active Directory Domain Services (AD DS), Group Policy, Dynamic Access Control (DAC), Work Folders, Workplace Join, Certificate Services, and Rights Management Services (RMS).

**Course Content:**

**Windows server 2008 R2 environments.** Students will also be able to:

* Describe the features and functionality of Active Directory Domain Services.
* Perform secure and efficient administration of Active Directory.
* Manage users and service accounts.
* Manage groups.
* Manage computer accounts.
* Implement a Group Policy infrastructure.
* Manage User Desktops with Group Policy.
* Manage enterprise security and configuration by using Group Policy settings.
* Secure administration.
* Improve the security of authentication in an AD DS Domain.
* Configure Domain Name System.
* Administer AD DS domain controllers.
* Manage sites and Active Directory Replication.
* Monitor, maintain and back up directory Service to ensure Directory Service continuity.
* Manage multiple domains and forests.

**Module 4: Cybersecurity Fundamentals**

**Overview:**The Cybersecurity Fundamentals course will provide learners with principles of data andtechnology that frame and define cybersecurity. Learners will gain insight into the importance ofcybersecurity and the integral role of cybersecurity professionals. The interactive, self-guided format willprovide a dynamic learning experience where users can explore foundational cybersecurity principles, security architecture, risk management, attacks, incidents, and emerging IT and IS technologies.

**Course Content:**

* Explain the core information assurance (IA) principles
* Identify the key components of cybersecurity network architecture
* Apply cybersecurity architecture principles
* Describe risk management processes and practices
* Identify security tools and hardening techniques
* Distinguish system and application security threats and vulnerabilities
* Describe different classes of attacks
* Define types of incidents including categories, responses and timelines for response
* Describe new and emerging IT and IS technologies
* Analyze threats and risks within context of the cybersecurity architecture
* Appraise cybersecurity incidents to apply appropriate response
* Evaluate decision making outcomes of cybersecurity scenarios
* Access additional external resources to supplement knowledge of cybersecurity

**Module 5: Windows Administration**

**Overview:** Students will learn how to manage Windows machine and Servers. Student will learn how to configure Windows machine, install software, monitor resources and secure system. Course also covers the Windows Virtualization.

**Course Content:**

**GETTING STARTED USING WINDOWS**

* Introducing Windows 7
* A First Look at the Windows Desktop
* Working with User Accounts
* Users, Passwords & Permissions
* Exploring Log O­& Power Options

**CUSTOMIZING THE WINDOWS DESKTOP**

* Using Icons & Shortcuts
* Adding Gadgets
* Customizing Backgrounds & Window Appearance
* Customizing Sounds, Screensavers & Icons
* Changing Screen Resolution

**ACCESSING THE START MENU**

* Using Start Menu Options
* Customizing the Start Menu
* Finding Programs, Files & Settings

**EXPLORING THE REVISED TASK BAR**

* Customizing the Notification Area
* Exploring Buttons on the Taskbar
* Taking Advantage of Jump Lists
* Setting Taskbar Properties

**OPTIMIZING THE WINDOWS USER EXPERIENCE**

* Moving & Sizing Windows
* Window Navigation Using Breadcrumbs
* Window Navigation & Customization
* Accessing & Configuring Libraries
* Organizing, Rating & Tagging Files
* Indexing & Search Options
* Searching for Files
* Sharing Files & Folders

**EXAMINING HARDWARE & SOFTWARE**

* Viewing Devices & Printers
* The Device Manager, Drivers & Power Management
* Setting Default Actions & Programs
* Installing & Uninstalling Software
* Alternate Hardware & Software Tools: Touch
* Speech Recognition
* Live Essentials & Services

**ENJOYING MEDIA**

* Playing Audio & Video Using the Media Player
* Ripping CDs & Creating Playlists
* Experiencing the Next Level with the Windows Media Center
* Tapping into the Windows 7 Gaming Experience

**CONNECTING TO A NETWORK**

* Networking Overview
* Getting Started with Windows 7 Networking
* Working with the Network Adaptor
* Viewing the Network Map & Changing the Workgroup
* Mapping a Network Drive

**MAINTAINING YOUR SYSTEM**

* Optimizing Performance
* Using Troubleshooters & the Action Center
* Using the Problem Steps Recorder
* Keeping Current with Windows Update

**SECURING YOUR SYSTEM & DATA**

* Working with System Restore & Shadow Copies
* Executing Backup & Restore
* Implementing BitLocker & BitLocker To Go
* Credits

### Building security policies

* Documenting server security
* Composing optimal Group Policies

### Auditing the server

* Diagnosing security issues
* Creating an audit trail
* Filtering the security log

### Optimizing Server Performance

* Assessing workloads
* Balancing applications and server roles
* Evaluating hardware and software components
* Reconfiguring the operating system

### Monitoring server performance

* Analyzing system behavior with Resource Monitor
* Establishing baselines with Performance Monitor
* Designing Data Collector Sets

### Detecting and resolving performance concerns

* Identifying Performance Monitor counters
* Solving the challenge of memory leaks
* Exploring the effect of services on server performance

## Implementing a High-Availability EnvironmentWindows in the cloud

* Preparing Windows features for the cloud
* Producing a disaster recovery plan
* Scheduling Windows backups
* Clustering Windows servers
* Meeting failover clustering requirements
* Recognizing the role of Quorums

### Virtualizing servers

* Increasing scalability potential with Hyper-V
* Speeding up recovery with replicas
* Maintaining high availability with live migration

**Module 6: Cisco Switches and Routers**

**Introduction to Networks**

* Exploring the Network
* Configuring a Network Operating System
* Network Protocols and Communications
* Network Access
* Ethernet
* Network, Application and Transport Layer
* IP Addressing
* Subnetting IP Networks
* It's a Network

**Scaling Networks**

* Growing the Network
* LAN Redundancy
* Link Aggregation
* Wireless
* Adjust and Troubleshoot Single-Area OSPF
* Multiarea OSPF
* EIGRP
* Adjust and Troubleshoot EIGRP
* iOS File Management

**Routing and Switching Essentials**

* Introduction to Switched Networks
* Basic Switching Configuration
* VLANs
* Routing Concepts
* Inter-VLAN and Static Routing
* Routing Dynamically
* Single-Area OSPF
* Access Control Lists
* DHCP
* Network Address Translation for IPV4

**Connecting Networks**

* Connecting to the WAN
* Configuring Serial Connections
* Broadband Solutions
* Securing Site-to-Site Connectivity
* Monitoring and Troubleshooting the Network
* Network Architectures

**Module 7: AWS Certified Developer Associate**

**Overview:** Amazon Web Services - (AWS) Certification is fast becoming the must have certificate for any IT professional working with AWS. This course is designed to help with AWS Certified Developer Associate (CDA) 2017 Exam. With this course, learner will understand AWS platform form developer perspective. This will introduce and familiarize learners to modern cloud architectures and widely used AWS environment.

**Course Content:**

* Overview
* Identity Access Management
* Setting up EC2 account
* S3 Essentials and configuration
* CORS configuration
* Building sample application
* Database Concepts
* DynamoDB and Simple Query Service
* Simple Notification Service
* Simple Workflow Service
* Using Elastic Beanstalk
* Using CloudFormation
* DNS and Routing
* Virtual Private Cloud (VPC) overview and configuration
* Certification Exam Preparation

**Module 8: DevOps**

**Overview:**This course prepares learners for a career in DevOps. Devops is a fast-growing field that brings Development and Operations team together to continuously build, integrate and deploy software. Students will use modern DevOps tools to learn principles of CI/CD, automation and configuration management and inter team collaboration with hands on labs.

**Course Content:**

* Overview
* Why DevOps?
* DevOps and Agile teams
* Source code management and configuration using GIT
* Build tools (Maven)
* Test Automation (Junit)
* Continuous integration with Jenkins
* Configuration management using Puppet
* Containerization using Docker
* Monitoring using Nagios