Curriculum Committee
Agenda
February 09, 2016
3:30pm-5:00pm
Moody Room

Debbie Hill    Martha Joyce          David Farrington          Karen Carroll
Roger Kennedy  Georgann Willis          Kristi Hurt (Sec)
Elizabeth Bastian   Tamra Loosli

Business to be reviewed by Curriculum Committee:
Minutes from November 10, 2015

New Courses:
To Be Presented By: John Blackwood
• CIS 285C—Cloud Services Technologies
• CIS 286A—Virtualization Technologies
• CIS 285A—Ethical Hacking
• CIS 285B—Advanced Network Device Security (CCNA Security)

New Program
To Be Presented: John Blackwood
• Pathway Certificate—Junior Cybersecurity Technician
• AAS-CIS with Emphasis in Cybersecurity

Course Revisions:
To Be Presented By:

Program Revisions:
To Be Presented By: John Blackwood
• AAS—Computer Information Systems

Informational: To Be Presented BY: John Blackwood
• Suspending AAS-Health Informatics

Next Curriculum Committee Scheduled for March 08, 2016
# Curriculum Committee

**Meeting Minutes**  
November 10, 2015  
3:30pm-5:00pm  
Jackson Hall 14

Debbie Hill    Martha Joyce    David Farrington    Karen Carroll  
Roger Kennedy   Georgann Willis  Lena Green    Kristi Hurt (Sec)  
Elizabeth Bastian   Tamra Loosli  Ken Carloni    Dee Winn  
Clay Baumgartner    Joel King    Mariah Beck    Mary Stinnett

### Approval of minutes from last meeting:

### Business to be reviewed by Curriculum Committee:

#### New Courses:

**To Be Presented By: Lena Green**
- BI 101B                      Not needed

**To Be Presented By: Ken Carloni**
- NR 141                                                                 Ok to move to IC
- NR 241                                                                 Ok to move to IC Title change

**To Be Presented By: Dee Winn**
- MTH 265                                                                 Ok to move to IC

**To Be Presented By: Clay Baumgartner**
- CIV 290                                                                 More discussion needed prior to IC
- GIS 203                                                                 Ok to move to IC/ replaces CIV 215
- GIS 280                                                                 Not needed
- OST 290                                                                 Discussion needed prior to IC
- SOILS 206                                                                 Ok to move to IC
- SUR 209                                                                 Ok to move to IC
- WQT 280                                                                 Discussion needed prior to IC

**To Be Presented By: Joel King**
- Emergency Medical Services Rescue                                                                 Ok to move to IC
- Fire Behavior and Combustion                                                                            Ok to move to IC
- Hazardous Materials Chemistry                                                                           Ok to move to IC
- Legal Aspects                                                                                             Ok to move to IC
- Occupational Health Safety                                                                             Ok to move to IC
- Principles of Emergency Services                                                                   Ok to move to IC
- Principles of Fire and Emergency Service Administration                                                Ok to move to IC

#### New Program

#### Course Revisions:

**To Be Presented By: Mariah Beck**
- MTH 105                                                                 Ok to move to IC
To Be Presented By: Ken Carloni
- BOT 204
- NR 230
- NR 240

Ok to move to IC—replaces BOT 203A
Ok to move to IC
Ok to move to IC

To Be Presented By: Clay Baumgartner
- CIV 214
- ENGR 112
- GIS 234
- GIS 235
- SUR 162
- SUR 163
- WQT 227
- WQT 228
- WQT 260
- WQT 261
- WQT 290

Ok to move to IC—CIV 114 changes to CIV 214
Ok to move to IC—Title change
Ok to move to IC—GIS 134 changes to GIS 234
Ok to move to IC—GIS 135 changes to GIS 235
Ok to move to IC—credit hour change
Ok to move to IC—credit hour change
Ok to move to IC—MTH pre-req change to MTH 052
Ok to move to IC—MTH pre-req change to MTH 052
Ok to move to IC—MTH pre-req change to MTH 052
Ok to move to IC
Discussion needed before moving to IC

To Be Presented By: Roger Kennedy
- EMS 175

Ok to move to IC—remove co-req

To Be Presented By: Joel King
- Deletion of CH, GS, PH
- FRP 123
- FRP 163
- FRP 230
- FRP 240
- FRP 280
- FRP 121 A
- FRP 121 B
- Delete CIS 120 as requirement for AAS Paramedicine
- Delete WR 122 as requirement for AAS Paramedicine
- FRP 101
- FRP 122
- FRP 202
- FRP 111
- FRP 212
- FRP 213
- FRP 230

Ok to move to IC—description change
Ok to move to IC—remove form catalog
Ok to move to IC—description change
Ok to move to IC—remove for catalog and program
Not needed
Ok to move to IC
Ok to move to IC—FRP 121 a&b replace FRP 121
Ok to move to IC
Ok to move to IC
Ok to move to IC—description change
Ok to move to IC—Credit and description change
Ok to move to IC
Ok to move to IC
Ok to move to IC
Ok to move to IC

To Be Presented By: Mary Stinnett
- MTH 211

Ok to move to IC

Program Revisions:
To Be Presented By: Ken Carloni
- NR-LM

Ok to move to IC

To Be Presented By: Roger Kennedy
- AAS in Paramedicine

Ok to move to IC—course changes
To Be Presented By: Joel King

- Fire Science

**Informational Items:**
Ken Carloni: Inclusions to AAOT Tables

Next Curriculum Committee Scheduled for November 17th, 2015
Course title: Ethical Hacking

Supervisor Signature:

Division CTE  Department CIS  Program AAS-CIS

Course No CIS 285A Title Ethical Hacking Terms Offered Winter

Credits 4 Lecture hrs/wk 3 Lec/Lab hrs/wk  Lab hrs/wk 2 Practicum hrs/wk

Banner Pre-req. CIS 152C Instructor Pre-req. Co-requisites .Length (wks) 11

Proposed implementation date Term Fall Year 2016  Grading Option Load Factor 4.4

Catalog Course Description

This course focuses on hacking techniques and technologies, with an emphasis on the ethics and legality of hacking; scanning, testing, and hacking of systems such as PCs, switches, and web servers.

Students will also learn about the attack process, intrusion detection, intrusion prevention, social engineering, DDoS and other attacks, buffer overflows, and virus creation.

All activities are performed in a safe environment and no actual network is harmed.

VOCATIONAL TECHNICAL PROPOSALS ONLY  LOWER DIVISION COLLEGIATE PROPOSALS ONLY

☑ Approved by Advisory Committee (Minutes Attached): Entire new CIS degree was approved during Spring 2015 Advisory Committee Meeting and again in Fall 2015 when I emailed the degree to all members of the advisory committee as a refresher.

Is this course on the "LDC Course List" of the State Department
☐ To be ☑ Yes ☐ No
If no, this course has been approved for transfer to: (college or university) (attached syllabus, course description, and outcomes): N/A

☑ Occupational Preparatory (organized degree/cert program)
☐ Occupational Supplementary

NEW COURSE APPROVAL FORM - Page2 of

Support Course: Indicate all programs for which this course will be required.

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Overlap Indicate departments and courses

None

COURSE DEVELOPED BY: John Blackwood DATE: Summer 2015

ATTACH the documents below:

- COMPLETE COURSE OUTLINE
- COMPLETE NEW COURSE JUSTIFICATION FORM
COURSE OUTLINE – Page 1 of

Course No: CIS 285A
Course Credit: 4
Lecture Hrs/wk: 3
Lab Hrs/Wk: 2
Lecture/Lab Hrs/Wk: 0
Practicum Hrs/Wk: 0
Clock Hours: 55
Length of Course 11 weeks
Banner enforced Prerequisite: CIS 152C
Instructor enforced Prerequisite:
Co-Requisite:
Load Factor: 4.4
Activity Code:
CIPS:

Course Title: Ethical Hacking
Developed By: John Blackwood
Development Date: Summer 2015
Revision Date: N/A

COURSE DESCRIPTION:
This course focuses on hacking techniques and technologies, with an emphasis on the ethics and legality of hacking; scanning, testing, and hacking of systems such as PCs, switches, and web servers.

Students will also learn about the attack process, intrusion detection, intrusion prevention, social engineering, DDoS and other attacks, buffer overflows, and virus creation.

All activities are performed in a safe environment and no actual network is harmed. course introduces wireless networking theory and its practical application and explores a variety of current and emerging wireless networking technologies.

COURSE OUTCOMES: Upon completion of this course the student should be able to:
• Define the term and concept of an ethical hacker
• Differentiate between ethical and illegal hacking activities
• Explain US and state law applicable to cybercrime
• List and describe the process by which an attacker works to compromise a target
• Define common attack types and their methods, such as enumeration and system hacking
• Implement penetration testing processes to test and discover system vulnerabilities

**REQUIRED TEXT/MATERIALS:** To be determined prior to when course is taught and this course will not be offered to students until Winter 2018 at the earliest.
OUTLINE: [Topics taught by week 1-10.]

Note: this outline is subject to change and depends on current wireless technologies & practice.

Week 1   Ethical Hacking Overview
Week 2   Network & Computer Attacks
Week 3   Footprinting and Social Engineering
Week 4   Port Scanning and Enumeration
Week 5   Programming for Security Professionals
Week 6   Linux OS Vulnerabilities
Week 7   Hacking Web Servers
Week 8   Hacking Wireless Networks
Week 9   Cryptography
Week 10  Protecting Networks with Security Devices
New Course title: Ethical Hacking

X ____________________________
Supervisor Signature:

CIS 185A: Ethical Hacking

Student need for course: Skill in hacking mitigation techniques is considered an essential skill in the emerging CIS security job market.

Course Information:

☐ AA  ☐ AS  ☐ AAS  ☐ Below 100 level  ☐ Elective  ☐ Certificate

☐ AAOT (Area of distribution): ________________

Cost of this course:

☐ No additional instructional costs (staff, material, equipment, or facilities) are required. The cost of this course will be covered by (i.e. fewer sections of ________ course):

☒ Additional instructional costs (staff, materials, equipment or facilities) are needed to offer this course. Itemize and estimate: 1 adjunct instructor to teach this or another course: $2500. This is one of three new courses in the new Cybersecurity degree.

Course impact on:

a. Student enrollment in other courses: None

b. Current program: None

Replacement course for: Course Number: ________ Title: ________

Disposition: __________ Signature: __________ Date: __________ Recommendation: __________

________________________________________
Curriculum Committee Chair

________________________________________
Vice President of Instruction
COURSE OUTLINE

Course No.: CIS 285A
Credit Hrs: 4
Lecture Hours: 3
Lab Hours: 2
Clock Hours: 55
Length of Course: 11 weeks
Prerequisite: Concurrent enrollment, or completion of CIS 152C or instructor approval

Title: Ethical Hacking
Developed by: John Blackwood
Date: August 2015
Reviewed: N/A

Course Description:
This course focuses on hacking techniques and technology from an offensive perspective and is regularly updated to reflect latest developments in cybersecurity and ethical hacking, including new hacking techniques, exploits, automated programs, and defensive recommendations as outlined by experts in the field and current industry practice.

Required Text:
Note: the text is subject to change before course is offered

Course Outcomes:
Students in this course will learn (to):
• The key issues plaguing the information security world, incident management process, and penetration testing
• Identify various types of footprinting, footprinting tools, and countermeasures available to an ethical hacker
• Employ network scanning techniques and scanning countermeasures
• Explain enumeration techniques and enumeration countermeasures
• Explain system hacking methodology, use steganography, identify steganalysis attacks, and covering of an attacker’s tracks
• Differentiate between the different types of Trojans, Trojan analysis, and Trojan countermeasures
• Understand and explain the working of viruses, virus analysis, computer worms, malware analysis procedure, and employ the appropriate countermeasures for each
• Explain packet sniffing techniques and demonstrate how to defend against sniffing
• Identify Social Engineering techniques, identify theft, and explain social engineering countermeasures
Explain DoS/DDoS attack techniques, botnets, DDoS attack tools, and DoS/DDoS countermeasures
Demonstrate knowledge in Session hijacking techniques and countermeasures
Identify the different types of webserver attacks, attack methodology, and available countermeasures
Identify the different types of web application attacks, web application hacking methodology, and available countermeasures
Understand and configure wireless Encryption, explain wireless hacking methodology, wireless hacking tools, and Wi-Fi security tools
Explain and configure firewall, IDS/IPS and honeypot evasion techniques, evasion tools, and countermeasures
Differentiate between various cloud computing concepts, threats, attacks, and security techniques and tools
Identify different types of cryptography ciphers, Public Key Infrastructure (PKI), cryptography attacks, and cryptanalysis tools
Explain the various types of penetration testing, security audit, vulnerability assessment, and penetration testing roadmap tools available to an ethical hacker

Course Outline:

1. Ethical Hacking Basics & the Technical Foundations of Hacking
2. Footprinting and Scanning; Enumeration and System Hacking
3. Linux and Automated Assessment Tools
4. Trojans, Backdoors, Sniffers, Session Hijacking, and Denial of Service
5. Web Server Hacking, Web Applications, and Database Attacks
6. Wireless Technologies, Mobile Security, and Attacks
7. IDS, IPS, Firewalls, and Honeypots
8. Buffer Overflows, Viruses, and Worms
9. Cryptographic Attacks and Defenses
10. Physical Security and Social Engineering
Course title: Advanced Network Device Security (CCNA Security)

Supervisor Signature:

Division CTE  Department CIS  Program AAS-CIS & AAS-CIS With Emphasis in Cybersecurity

Course No CIS 285B Title Advanced Network Device Security (CCNA Security) Terms Offered Winter

Credits 4 Lecture hrs/wk 3 Lec/Lab hrs/wk  Lab hrs/wk 2 Practicum hrs/wk

Banner Pre-req. CIS 152C Instructor Pre-req.  Co-requisites  .Length (wks) 11

Proposed implementation date Term Fall Year 2016  Grading Option  Load Factor 4.4

Catalog Course Description

This course is a Cisco Networking Academy course, mapped to the Cisco Certified Network Administrator Security (CCNA Security) industry credential. This course will expose students to the array of security features that can be implemented using Cisco switches and routers.

Instruction will include, but is not limited to, authentication methods, common network attacks and how to safeguard against them, communication security (remote access, e-mail, the web, directory and file transfer, and wireless data), infrastructure security (network devices and media), and the proper use of perimeter topologies such as demilitarized zones (DMZs), Extranets, and Intranets to establish network security.

Cryptography basics are also introduced, including the differences between asymmetric and symmetric algorithms, and the different types of Public Key Infrastructure (PKI) certificates and their usage. Operational/organizational security is discussed as it relates to physical security, and disaster recovery.
VOCATIONAL TECHNICAL PROPOSALS ONLY  LOWER DIVISION COLLEGIATE PROPOSALS ONLY

☑ Approved by Advisory Committee (Minutes Attached): Entire new CIS degree with emphasis in cybersecurity was approved during Spring 2015 Advisory Committee Meeting.

Is this course on the "LDC Course List" of the State Department
☐ To be ☑ Yes ☐ No

If no, this course has been approved for transfer to: (college or university) (attached syllabus, course description, and outcomes): N/A

☑ Occupational Preparatory (organized degree/cert program)
☐ Occupational Supplementary

NEW COURSE APPROVAL FORM - Page2 of

Support Course: Indicate all programs for which this course will be required.

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Overlap Indicate departments and courses
None

COURSE DEVELOPED BY: John Blackwood DATE: Summer 2015

ATTACH the documents below:

- COMPLETE COURSE OUTLINE
- COMPLETE NEW COURSE JUSTIFICATION FORM
Course Title: Advanced Network Device Security (CCNA Security)

Developed By: John Blackwood

Development Date: Summer 2015

Revision Date: N/A

COURSE DESCRIPTION:

This course is a Cisco Networking Academy course, mapped to the Cisco Certified Network Administrator Security (CCNA Security) industry credential. This course will expose students to the array of security features that can be implemented using Cisco switches and routers.

Instruction will include, but is not limited to, authentication methods, common network attacks and how to safeguard against them, communication security (remote access, e-mail, the web, directory and file transfer, and wireless data), infrastructure security (network devices and media), and the proper use of perimeter topologies such as demilitarized zones (DMZs), Extranets, and Intranets to establish network security.
Cryptography basics are also introduced, including the differences between asymmetric and symmetric algorithms, and the different types of Public Key Infrastructure (PKI) certificates and their usage. Operational/organizational security is discussed as it relates to physical security, and disaster recovery.

**COURSE OUTCOMES:** Upon completion of this course the student should be able to:

- Describe the security threats facing modern network infrastructures
- Secure network device access using common router and switch security features
- Implement Authentication, Authorization, and Accounting (AAA) on network devices
- Mitigate threats to networks using Access Control Lists (ACLs)
- Understand and implement secure network management and reporting
- Understand and Mitigate common Layer 2 attacks
- Understand and implement the Cisco IOS firewall feature set
- Understand and implement the Cisco IOS Intrusion prevention system (IPS) feature set
- Understand and implement site-to-site Internet Protocol Security (IPsec) virtual private networks (VPNs)
- Understand and administer effective security policies

**REQUIRED TEXT/MATERIALS:** To be determined prior to when course is taught. The Cisco Networking Academy provides most of the instruction material for this course.
OUTLINE: [Topics taught by week 1-10.]

Note: this outline is subject to change and depends on current technologies & practice.

Week 1  Modern Network Security Threats
Week 2  Securing Network Devices
Week 3  Authentication, Authorization, and Accounting
Week 4  Implementing Firewall Technologies; Implementing Intrusion Prevention
Week 5  Securing the LAN
Week 6  Cryptographic Systems
Week 7  Implementing VPNs
Week 8  Implementing the Cisco ASA
Week 9  Advanced Cisco ASA Concepts
Week 10 Managing a Secure Network
New Course title: E
X________________________________________

Supervisor Signature:

CIS 185B: Advanced Network Device Security (CCNA Security)

Student need for course: Skill in device security techniques is considered an essential skill in the emerging CIS security job market.

Course Information:

☐ AA  ☐ AS  ☑ AAS  ☐ Below 100 level ☐ Elective ☐ Certificate

☐ AAOT (Area of distribution): _____________

Cost of this course:

☑ No additional instructional costs (staff, material, equipment, or facilities) are required. The cost of this course will be covered by (i.e. fewer sections of ________ course): This course replaces CIS 289M - Microsoft Windows Server Administration III (same ILC) because that course is not needed to fully cover Server concepts.

☐ Additional instructional costs (staff, materials, equipment or facilities) are needed to offer this course. Itemize and estimate: 1 adjunct instructor to teach this or another course: $2500

Course impact on:

a. Student enrollment in other courses: None

b. Current program: None

Replacement course for: Course Number: CIS 289M Title: Microsoft Windows Server Administration III

Disposition: Signature Date Recommendation

Curriculum Committee Chair Vice President of Instruction
COURSE OUTLINE

Course No.: CIS 285B
Credit Hrs: 4
Lecture Hours: 3
Lab Hours: 2
Clock Hours: 55
Length of Course: 11 weeks
Prerequisite: Completion of CIS 152C or instructor approval

Title: Advanced Network Device Security (CCNA Security)
Developed by: John Blackwood
Date: August 2015
Reviewed: N/A

Course Description: This course is a Cisco Networking Academy course, mapped to the Cisco Certified Network Administrator Security (CCNA Security) industry credential. This course will expose students to the array of security features that can be implemented using Cisco switches and routers.

Instruction will include, but is not limited to, authentication methods, common network attacks and how to safeguard against them, communication security (remote access, e-mail, the web, directory and file transfer, and wireless data), infrastructure security (network devices and media, and the proper use of perimeter topologies such as demilitarized zones (DMZ)s, Extranets, and Intranets to establish network security).

Cryptography basics are also introduced, including the differences between asymmetric and symmetric algorithms, and the different types of Public Key Infrastructure (PKI) certificates and their usage. Operational/organizational security is discussed as it relates to physical security, and disaster recovery.

Required Text:
No required text; CBT Nuggets (videos) for Cisco 210-260
Note: the text is subject to change before course is offered

Course Outcomes:
Students in this course will learn (to):
• Describe the security threats facing modern network infrastructures
• Secure network device access using common router and switch security features
• Implement Authentication, Authorization, and Accounting (AAA) on network devices
• Mitigate threats to networks using Access Control Lists (ACLs)
• Understand and implement secure network management and reporting
• Understand and Mitigate common Layer 2 attacks
• Understand and implement the Cisco IOS firewall feature set
• Understand and implement the Cisco IOS Intrusion prevention system (IPS) feature set
• Understand and implement site-to-site Internet Protocol Security (IPsec) virtual private networks (VPNs)
• Understand and administer effective security policies

Course Outline:

1. Modern Network Security Threats
2. Securing Network Devices
3. Accounting, Authorization, and Accounting
4. Implementing Firewall Technologies
5. Implementing Intrusion Prevention
6. Securing the Local-Area Network (LAN)
7. Cryptographic Systems
8. Implementing Virtual Private Networks (VPNs)
9. Implementing the Cisco Adaptive Security Appliance (ASA)
10. Advanced ASA Concepts and Configurations
11. Managing a Secure Network
Course title: Cloud Services Technologies
X________________________________________
Supervisor Signature:

Division CTE  Department CIS  Program AAS-CIS With Emphasis in Cybersecurity

Course No CIS 285C Title Cloud Services Technologies Terms Offered Spring

Credits 3 Lecture hrs/wk 3 Lec/Lab hrs/wk  Lab hrs/wk 1 Practicum hrs/wk

Banner Pre-req. CIS 288M Instructor Pre-req. Co-requisites Length (wks) 11

Proposed implementation date Term Fall Year 2016  Grading Option Load Factor 3.7

Catalog Course Description

This course introduces students to the technologies and theory of Infrastructure as a Service (IaaS) using common cloud providers such as Microsoft Windows Azure and/or Amazon Web Services (AWS).

Students will learn cloud computing, cloud storage and content delivery, cloud database types and uses, cloud networking (private and hybrid uses), cloud security, and the basics of cloud analytics.

VOCATIONAL TECHNICAL PROPOSALS ONLY  LOWER DIVISION COLLEGIATE PROPOSALS ONLY

☑ Approved by Advisory Committee (Minutes Attached): Entire new CIS degree with emphasis in cybersecurity was approved during Spring 2015 Advisory Committee Meeting and again in Fall 2015 when I emailed the degree to all members of the advisory committee as a refresher.

Is this course on the "LDC Course List" of the State Department
☐ To be ☑ Yes  ☐ No
Support Course: Indicate all programs for which this course will be required.

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Overlap Indicate departments and courses

None

COURSE DEVELOPED BY: John Blackwood DATE: Summer 2015

ATTACH the documents below:

- COMPLETE COURSE OUTLINE
- COMPLETE NEW COURSE JUSTIFICATION FORM
Course Title: Cloud Services Technologies

Developed By: John Blackwood

Development Date: Summer 2015

Revision Date: N/A

COURSE DESCRIPTION:

This course introduces students to the technologies and theory of Infrastructure as a Service (IaaS) using common cloud providers such as Microsoft Windows Azure and/or Amazon Web Services (AWS).

Students will learn cloud computing, cloud storage and content delivery, cloud database types and uses, cloud networking (private and hybrid uses), cloud security, cloud deployment and management; and Enterprise IT applications.

COURSE OUTCOMES: Upon completion of this course the student should be able to:

- Design and implement websites
• Create and manage virtual machines
• Design and implement cloud services
• Design and implement a storage strategy
• Manage application and network services
• Implement websites
• Implement virtual machines
• Implement cloud services
• Implement storage
• Implement an Azure Active Directory
• Implement virtual networks

**REQUIRED TEXT/MATERIALS:** To be determined prior to when course is taught. Texts are constantly changing in this field and this course will not be offered to students until Spring 2018 at the earliest.
OUTLINE: [Topics taught by week 1-10.]

Note: this outline is subject to change and depends on current technologies & practice.

Week 1  Introduction to cloud technologies & new student account setup
Week 2  Cloud websites
Week 3  Virtual machines in the cloud
Week 4  Virtual machines in the cloud (cont’d)
Week 5  Introduction to cloud services
Week 6  Cloud storage options and implementation
Week 7  Cloud applications and networking services
Week 8  Active Directory in the Cloud
Week 9  Active Directory in the Cloud (cont’d)
Week 10 Virtual networks and networking
New Course title: E
X __________________________

Supervisor Signature:

CIS 285C: Cloud Services Technologies

Student need for course: Skill in cloud (IaaS) techniques is considered an essential skill in the emerging CIS security job market.

Course Information:

☐ AA  ☐ AS  ☑ AAS  ☐ Below 100 level  ☐ Elective  ☐ Certificate

☐ AAOT (Area of distribution): ________________

Cost of this course:

☐ No additional instructional costs (staff, material, equipment, or facilities) are required. The cost of this course will be covered by (i.e. fewer sections of ________ course):

☒ Additional instructional costs (staff, materials, equipment or facilities) are needed to offer this course. Itemize and estimate: 1 adjunct instructor to teach this or another course: $2500. This is one of three new courses in the new Cybersecurity degree.

Course impact on:

a. Student enrollment in other courses: None

b. Current program: None

Replacement course for: Course Number: N/A Title: N/A

Disposition: Signature Date Recommendation

________________________________________
Curriculum Committee Chair Vice President of Instruction
Course No.: CIS 285C
Credit Hrs: 3
Lecture Hours: 2
Lab Hours: 2
Clock Hours: 44
Length of Course: 11 weeks
Prerequisite: Completion of CIS 288M or instructor approval

Title: Cloud Services Technologies
Developed by: John Blackwood
Date: August 2015
Reviewed: N/A

Special note: Due to the constant change in this field, we may cover AWS, Microsoft One Drive, EMC or some new technology that enters the market space before this course is offered. We will offer content based on current advisory committee recommendations and industry practice.

Course Description: This course in System Operations on Amazon Web Services (AWS) is designed to teach those in a Systems Administrator or Developer Operations (DevOps) role how to create automatable and repeatable deployments of networks and systems on the AWS platform. The course covers the specific AWS features and tools related to configuration and deployment, as well as common techniques used throughout the industry for configuring and deploying systems.

Required Text:
No required text; CBT Nuggets (videos) for Amazon Web Services (AWS) Essentials, and AWS SysOps Administrator-Associate Level (two video courses)
Note: the text is subject to change before course is offered

Course Outcomes:
Students in this course will learn (to):
Note: the course outcomes are subject to change before course is offered.
• Recognize terminology and concepts as they relate to the AWS platform
• Navigate the AWS Management Console
• Understand the security measures AWS provides
• Differentiate AWS Storage options and create an Amazon Simple Storage Service (S3) bucket
• Recognize AWS Compute and Networking options and use Amazon Elastic Compute Cloud (EC2) and Amazon Elastic Block Storage (EBS)
• Describe Managed Services and Database options
• Use Amazon Relational Database Service (RDS) to launch an application
- Identify Deployment and Management options
- Use standard AWS infrastructure features such as Amazon Virtual Private Cloud (VPC), Amazon Elastic Compute Cloud (EC2), Elastic Load Balancing, and Auto Scaling from the command line
- Use AWS CloudFormation and other automation technologies to produce stacks of AWS resources that can be deployed in an automated, repeatable fashion
- Build functioning virtual private networks with Amazon VPC from the ground up using the AWS Management Console
- Deploy Amazon EC2 instances using command line calls and troubleshoot the most common problems with instances
- Monitor the health of Amazon EC2 instances and other AWS services
- Manage user identity, AWS permissions, and security in the cloud
- Manage resource consumption in an AWS account using tools such as Amazon CloudWatch, tagging, and Trusted Advisor
- Select and implement the best strategy for creating reusable Amazon EC2 instances
- Configure a set of Amazon EC2 instances that launch behind a load balancer, with the system scaling up and down in response to demand
- Edit and troubleshoot a basic AWS CloudFormation stack definition

Course Outline:
Note: the course outcomes are subject to change before course is offered.

1. Introduction & History to AWS
2. AWS Storage & Content Delivery
3. Compute Services & Networking
4. AWS Managed Services & Databases
5. Deployment and Management
6. Monitoring, Metrics, and High Availability
7. Analysis
8. Deployment and Provisioning
9. Data Management
10. Security & Networking
Course title: Virtualization Technologies

Supervisor Signature:

Division CTE  Department CIS  Program AAS-CIS With Emphasis in Cybersecurity

Course No CIS 286A Title Virtualization Technologies Terms Offered Spring

Credits 3 Lecture hrs/wk 3 Lec/Lab hrs/wk  Lab hrs/wk 1 Practicum hrs/wk

Banner Pre-req. CIS 288M Instructor Pre-req.  Co-requisites  Length (wks) 11

Proposed implementation date Term Fall Year 2016  Grading Option  Load Factor 3.7

Catalog Course Description

This course introduces students to the technologies and theory of operating system virtualization. This course is designed for system administrators, system engineers, operators responsible for ESXi and vCenter server, and VMware IT Academy instructors. Students will learn installation, configuration, and management of VMware vSphere, which consists of VMware ESXi and VMware vCenter Server. This course is based on the current versions of ESXi and vCenter Server.

VOCATIONAL TECHNICAL PROPOSALS ONLY  LOWER DIVISION COLLEGIATE PROPOSALS ONLY

☑️ Approved by Advisory Committee (Minutes Attached): Entire new CIS degree with emphasis in cybersecurity was approved during Spring 2015 Advisory Committee Meeting and again in Fall 2015 when I emailed the degree to all members of the advisory committee as a refresher.

Is this course on the "LDC Course List" of the State Department

☐ To be ☑️ Yes ☐ No
If no, this course has been approved for transfer to: (college or university) (attached syllabus, course description, and outcomes): N/A

☑ Occupational Preparatory (organized degree/cert program)
☐ Occupational Supplementary

---

Support Course: Indicate all programs for which this course will be required.

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>DEPARTMENT</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAS-CIS With an Emphasis in Cybersecurity</td>
<td>CIS</td>
<td>Fall 2016</td>
</tr>
</tbody>
</table>

Overlap Indicate departments and courses

None

COURSE DEVELOPED BY: John Blackwood DATE: Summer 2015

ATTACH the documents below:

- COMPLETE COURSE OUTLINE
- COMPLETE NEW COURSE JUSTIFICATION FORM
Course No: CIS 286A
Course Credit: 3
Lecture Hrs/wk: 3
Lab Hrs/Wk: 1
Lecture/Lab Hrs/Wk: 0
Practicum Hrs/Wk: 0
Clock Hours: 44
Length of Course 11 weeks
Banner enforced Prerequisite: CIS 288M
Instructor enforced Prerequisite:
Co-Requisite:
Load Factor: 3.7
Activity Code:
CIPS:

Course Title: Cloud Services Technologies
Developed By: John Blackwood
Development Date: Summer 2015
Revision Date: N/A

COURSE DESCRIPTION:
This course introduces students to the technologies and theory of operating system virtualization.
This course is designed for system administrators, system engineers, operators responsible for creating and implementing virtualization. Students will learn installation, configuration, and management of Hyper-V and Hyper-V Manager; and/or VMware vSphere, which consists of VMware ESXi and VMware vCenter Server. This course is based on the current versions of Hyper-V, ESXi, and vCenter Server.
Technologies covered will vary by term, depending on industry trends.
COURSE OUTCOMES: Upon completion of this course the student should be able to:

- Describe OS virtualization and its uses
- Create a virtualized topology that supports a complete virtualization solution
- Deploy an virtualized environment
- Manage virtual machines
- Deploy and manage thin-provisioned virtual machines
- Migrate running virtual machines from one hypervisor to another
- Manage access control to a hypervisor
- Monitor resource usage
- Manage high availability, fault tolerance, and data protection using common technologies and practices
- Apply a patch to a hypervisor

REQUIRED TEXT/MATERIALS: To be determined prior to when course is taught. Texts are constantly changing in this field and this course will not be offered to students until Spring 2018 at the earliest.
OUTLINE: [Topics taught by week 1-10.]

Note: this outline is subject to change and depends on current technologies & practice.

Week 1   Introduction to virtualization technologies & new student setup
Week 2   The virtualized data center
Week 3   Create virtual machines (VMs)
Week 4   Configure and manage VMs
Week 5   Configure and manage virtual storage
Week 6   VM management (cloning and migrations)
Week 7   Access and authentication control to hypervisors
Week 8   Resource management and monitoring
Week 9   High availability, scalability, and fault tolerance
Week 10  Patch management
New Course title: E

X ____________________________

Supervisor Signature:

CIS 286A: Virtualization Technologies

Student need for course: Skill in virtualization technologies is considered an essential skill in the emerging CIS security job market.

Course Information:

☐ AA  ☐ AS  ☑ AAS  ☐ Below 100 level  ☐ Elective  ☐ Certificate

☐ AAOT (Area of distribution): ______________

Cost of this course:

☐ No additional instructional costs (staff, material, equipment, or facilities) are required. The cost of this course will be covered by (i.e. fewer sections of ________ course):

☒ Additional instructional costs (staff, materials, equipment or facilities) are needed to offer this course. Itemize and estimate: 1 adjunct instructor to teach this or another course: $2500. This is one of three new courses in the new Cybersecurity degree.

Course impact on:

a. Student enrollment in other courses: None

b. Current program: None

Replacement course for: Course Number: N/A  Title: N/A

Disposition: Signature  Date  Recommendation

__________________________________________________________________________

Curriculum Committee Chair  Vice President of Instruction
Course No.: CIS 286A  
Credit Hrs: 3  
Lecture Hours: 2  
Lab Hours: 2  
Clock Hours: 44  
Length of Course: 11 weeks  
Prerequisite: Completion of CIS 288M or instructor approval

Title: Virtualization Technologies  
Developed by: John Blackwood  
Date: August 2015  
Reviewed: N/A

Special note: Due to the constant change in this field, we may cover VMware or Microsoft virtualization or some new technology that enters the market space before this course is offered. We will offer content based on current advisory committee recommendations and industry practice.

Course Description: This hands-on course explores the installation, configuration, and management of VMware vSphere, which is made up of VMware ESXi and vCenter Server.

Required Text:  
VCP6-DCV Official Cert Guide (Exam #2VO-621) by John Davis / Steve Baca / Owen Thomas, published by VMware Press (not yet published); CBT Nuggets (videos) for VMware vSphere 6 (VCP-DCV)  
Note: the text is subject to change before course is offered because VMware versions change every two years.

Course Outcomes:  
Students in this course will learn (to):  
Note: the course outcomes are subject to change before course is offered.
- Deploy an ESXi host  
- Deploy a vCenter Server instance  
- Deploy a vCenter Server appliance  
- Manage an ESXi host using vCenter Server  
- Manage ESXi storage using vCenter Server  
- Manage ESXi networking using vCenter Server  
- Manage virtual machines using vCenter Server  
- Deploy and manage thin  
- Migrate virtual machines with VMware vSphere
• Manage vSphere infrastructure with VMware vSphere
• VMware vSphere
• Migrate virtual machines using VMware vSphere
• Manage access control using vCenter Server
• Monitor resource usage using vCenter Server
• Manage VMware vSphere
• Tolerance, and VMware vSphere
• Apply patches using VMware vSphere

Course Outline:
Note: the course outcomes are subject to change before course is offered.

1. Introduction to the VMware Virtualized Data Center
2. Creating Virtual Machines (VMs)
3. VMware vCenter Server
4. Configure and Manage Virtual Networks
5. Configure and Manage Virtual Storage
6. VM Management, Access and Authentication Control
7. Resource Management and Monitoring
8. High Availability and Resource Management
9. Scalability and Patch Management
10. Installing VMware vSphere Components
COMPUTER INFORMATION SYSTEMS

PATHWAYS CERTIFICATE: Junior Cybersecurity Technician – 14 CREDITS

CAREER DESCRIPTION

This Pathways Certificate is a short-term educational goal aimed towards specific areas in Computer Information Systems. This certificate will address the need for a logical pathway of success for students. Students will be able to earn the certificate after completing our base AAS-CIS degree or as part of our new AAS-CIS With an Emphasis in Cybersecurity. Those who are already employed in the profession that want to upgrade existing or initially learn cybersecurity skills may also benefit from this certification. This certificate may lead to entry-level network administration employment.

APPLICATION & ACCEPTANCE

This certificate recognizes student’s achievement and validates skills learned. In addition, the certificate can be placed on the student’s resume, increasing the student’s chances of obtaining employment while continuing to attend college (on a full- or part-time basis).

According to Oregon Labor Statistics (OLMIS), job openings for Cybersecurity falls within three main occupations. They are 1) Information Security Analysts (15-1122); 2) Network and Computer Systems Administrators (15-1142); and 3) Business Operations Specialists (13-1199).

Link to Occupational Report for 15-1122

Statewide employment analysis for 15-1122:

Employment in this occupation in 2012 was somewhat smaller than the statewide average for all occupations. The total number of job openings is projected to be somewhat lower than the statewide average number of job openings for all occupations through 2022. This occupation is expected to grow at a much faster rate than the statewide average growth rate for all occupations through 2022. Limited employment opportunities exist for trained workers.

Link to Occupational Report for 15-1122

Statewide employment analysis for 15-1122:

Employment in this occupation in 2012 was much larger than the statewide average for all occupations. The total number of job openings is projected to be somewhat higher than the statewide average number of job openings for all occupations through 2022. This occupation is
expected to grow at about the statewide average growth rate for all occupations through 2022.

Reasonable employment opportunities exist for trained workers largely due to the significant number of job openings projected for this occupation.

Link to Occupational Report for 13-1199

Statewide employment analysis for 13-1199:

Employment in this occupation in 2012 was much larger than the statewide average for all occupations. The total number of job openings is projected to be much higher than the statewide average number of job openings for all occupations through 2022. This occupation is expected to grow at about the statewide average growth rate for all occupations through 2022.

Reasonable employment opportunities exist for trained workers largely due to the significant number of job openings projected for this occupation.

PROGRAM OUTCOMES

The Junior Cybersecurity Technician Certificate is a pathway certificate. All courses in the certificate are found in the CIS AAS With an Emphasis on Cybersecurity Degree. This certificate will benefit those who want to:

- Be prepared for entry-level jobs in cybersecurity.
- Learn new or upgrade their cybersecurity skills.

PREREQUISITES

Completion of MTH 095 or placement test scores indicating MTH 105 or higher and WR 121 or higher is required. All of the courses in the certificate also assume an intermediate level in the information technology (IT) field and are require prerequisite courses/knowledge.

UCC faculty strongly recommends that CIS certificate- (or degree-) seeking students have access to a personally-owned, 64-bit Windows 7/8 (or newer) laptop with at least 16 GB of RAM, 1-2 TB hard disk, and other standard laptop accessories. Students can purchase a full version of Microsoft Office in the UCC bookstore at a very low, discounted student price.
<table>
<thead>
<tr>
<th>COURSES</th>
<th>Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CIS 285A Ethical Hacking</td>
<td></td>
<td>4 CR</td>
</tr>
<tr>
<td>CIS 285B Advanced Network Device Security (CCNA Security)</td>
<td></td>
<td>4 CR</td>
</tr>
<tr>
<td>CIS 285C Cloud Services Technologies</td>
<td></td>
<td>3 CR</td>
</tr>
<tr>
<td>CIS 286A Virtualization Technologies</td>
<td></td>
<td>3 CR</td>
</tr>
</tbody>
</table>
Basic Information
Name of Program: AAS - Computer Information Systems with Emphasis in Cybersecurity
Contact Name and Title: John Blackwood, CIS/CS faculty
Department: Computer Information Systems
Supervisor: Jesse Morrow

Program-Specific Information
Date, Year, and Term of Proposed Implementation:
Fall 2016

Program Award:
___Less than 1 year certificate
___ 1 year certificate
___ 2 year certificate
___X_Career Pathway certificate
___X_Degree

Number of Credits: 107-108

New Program/Certificate Title: AAS - Computer Information Systems with Emphasis in Cybersecurity

Program Description (This is the description that will appear in the catalog, so make sure it is exactly what you want)
The Computer Information Systems with an emphasis in cybersecurity program is a two-year sequence of classes designed to prepare you, via hands-on training, for employment in the computer area as an entry-level network administrator, computer support person, web designer, or computer programmer, while developing general problem-solving and troubleshooting skills that can be applied to networking, server, computer, web, and business programming environments.

Further, this degree adds hands-on cybersecurity training in ethical hacking, cloud services, virtualization, switches, routers, and Adaptive Security Appliance (ASA) devices.

At UCC, you will learn to program in a high-level programming language and to apply programming concepts in a variety of environments. You will become proficient as a user and manager of server and desktop operating systems, switches, routers and ASAs. You will also learn how to configure and modify the hardware components of server and desktop systems. In addition, the CIS program provides a strong foundation in basic business and project management principles and practices. Finally, the program develops verbal and written communication skills.

Labor Market Need (Brief description; you will also need to complete an LMI worksheet, EXCEPT for Career Pathways Certificates):
Network and Computer Administrators (151142)
Computer Programmers (151131)
Computer User Support Specialists (151151)
Information Security Analysts (151122)
Target Student Population:
Douglas County high school graduates, UCC students who have not declared a college major, and others seeking higher education who meet the criteria for entry into our program. Particular emphasis will be placed on students from underrepresented populations.

Program Outcomes: (please list numerically)
1. Train students in a variety of modern internet and business-oriented computer skills.
2. Develop software and hardware problem-solving skills using programming logic and hands-on lab situations.
3. Learn to efficiently use common office applications, receive practical experience with a variety of operating systems, and work with typical hardware configurations.
4. Demonstrate proficiency in information technology related to computer programming; device initiation, configuration, and management; project management; and webpage design.
5. Employ common cybersecurity practices to eliminate or mitigate threats that originate from inside and outside of the organization.

Program Impacts:
_X_ Standard Instructional Costs (staff, materials, equipment or facilities) are required.
_X_ Additional instructional costs ((staff, materials, equipment or facilities) are needed.
_X_ Impact to other divisions in terms of scheduling or staffing.

Program Impact Description (for any of the program impacts listed above, please describe):
The Cybersecurity AAS degree is the same as the CIS degree except that it adds: Optional 1 credit increase for CWE (CIS 280), Ethical Hacking (CIS 285A; 4 credits), Cloud Services Technologies (CIS 285C; 3 credits), and Virtualization Technologies (CIS 286; 3 credits) as new courses.

Additional Instructor Requirements (FT/PT, number, qualification, ability to recruit):
We will work to teach the new courses using existing CIS/CS staff (John Blackwood, Vince Yip, and Wayne Hoffman). Lower level courses will be assigned to 1-3 existing or new adjunct, which require a lower skillset than the new courses.
Program Standards
*Using new or parent program information, create a short description that provides the requested data. These descriptions will be entered exactly as they appear in the New Program Form into the official record with the State of Oregon. The maximum number of characters for each standard is 4,000.*

**Standard A – Need:**
The community college provides clear evidence of the need for the program.
Network and computer administration employment in Oregon is expected to grow much larger than the statewide average for all occupations; the total number of job openings is expected to grow somewhat higher than the statewide average for all occupations; and its growth is expected to occur at a rate at about the statewide average growth rate for all occupations.

Adding cybersecurity training to the above base training prepares UCC students with cutting-edge skills that all network and computer administration employers seek in new employees.

**Standard B – Collaboration:**
The community college utilizes systemic methods for meaningful and ongoing involvement of the appropriate constituencies.
Our local advisory committee approved the creation of this degree last spring at our annual meeting and again this fall via an email query with the degree attached. We will continue to work with our advisory committee to keep the degree’s offerings current and relevant to the job market.

During the 2015-2016 school year, UCC entered into a collaboration agreement with Mount Hood CC, the only other CC in the state to offer an AAS in cybersecurity. MHCC requested the partnership, which facilitated its obtaining the Center for Academic Excellence-2 Year Institution (CAE2Y), a designation granted by the NSA. UCC and MHCC will work together to share best practices and other resources because of this agreement.

Finally, in Spring 2015, the CC approved my request to bring this degree forward for approval.

**Standard C – Alignment:**
The program is aligned with the appropriate education, workforce development, and economic development activities.
This degree is designed to meet the needs of students who want to complete an AAS in cybersecurity and gain employment in a field offering a family wage and continued job growth.

**Standard D – Design:**
The program leads to student achievement of academic and technical knowledge, skills, and related proficiencies.
Students completing the AAS are eligible to transfer to Oregon 4-year colleges offering the applied baccalaureate degree option. We expect that students will graduate from the UCC, enter the work force, and continue their education while employed in the field.

**Standard E – Capacity:**
The community college identifies and has the resources to develop, implement, and sustain the program.
UCC currently has the capacity and resources to adequately meet the needs of an additional 12-20 CIS students per year. No new equipment is needed for the implementation of this degree.
### Proposed Courses – please attach course outlines

<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 120</td>
<td>Introduction to CIS</td>
<td>4</td>
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<tr>
<td>CIS 122</td>
<td>Orientation to Programming</td>
<td>4</td>
</tr>
<tr>
<td>CIS 140M</td>
<td>Intro to Windows OS</td>
<td>4</td>
</tr>
<tr>
<td>WR 121</td>
<td>English Comp*</td>
<td>4</td>
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<tr>
<td>CIS 133CS</td>
<td>Intro to Programming</td>
<td>4</td>
</tr>
<tr>
<td>CIS 240M</td>
<td>Install. &amp; Configuring MS Windows Server</td>
<td>4</td>
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<tr>
<td>MTH</td>
<td>MTH 105 or higher</td>
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<tr>
<td>WR 122 or 227</td>
<td>English Comp* or Technical Writing</td>
<td>4</td>
</tr>
<tr>
<td>CIS 151C</td>
<td>Networking Essentials (Cisco 1)</td>
<td>4</td>
</tr>
<tr>
<td>CIS 233CS</td>
<td>Intermediate Programming</td>
<td>4</td>
</tr>
<tr>
<td>CIS 175</td>
<td>Intro to DBMS I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 279M</td>
<td>MS Windows Server Admin I</td>
<td>4</td>
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<tr>
<td>PSY 101</td>
<td>Psychology of Human Relations</td>
<td>3</td>
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<tr>
<td>CIS 152C</td>
<td>Intro to Basic Switching (Cisco 2)</td>
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<tr>
<td>CIS 195</td>
<td>Authoring for the WWW I</td>
<td>4</td>
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<td>CIS 276</td>
<td>Intro to DBMS II</td>
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<tr>
<td>CIS 280</td>
<td>Cooperative Work Experience</td>
<td>2-3</td>
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<tr>
<td>CIS 153C</td>
<td>Intermediate Switching &amp; Routing (Cisco 3)</td>
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<tr>
<td>CIS 284</td>
<td>Network Security Fundamentals</td>
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<tr>
<td>CIS 285B</td>
<td>Advanced Network Device Security (CCNA Security)</td>
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<tr>
<td>CIS 295</td>
<td>Authoring for the Web II</td>
<td>4</td>
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</table>
CIS 154C       WAN Protocols (Cisco 4)       4
CIS 245       Project Management       4
SP 111       Fundamentals of Public Speaking       4
CIS 288M       MS Windows Server Admin II       4
CIS 285A       Ethical Hacking       4
CIS 285C       Cloud Services Technologies       3
CIS 286       Virtualization Technologies       3

Total credits for Program       107-108

Additional Process Items
Please check all of the additional forms and documents you have completed and submitted to Curriculum Committee. Links to fill-able versions of these forms can be found at http://umpqua.edu/resources-and-services/faculty-and-staff/committees-taskforces.

_X_ Required: Labor Market Information (LMI) Form (not needed for Career Pathway Certificate)
_X_ Required: Course Outlines for all courses
__ Specialized Form: Advisory Committee
__ Specialized Form: Start Up Budget
### Prerequisites and Course Availability per Term

**Term Offered** | **Course No. and Course Name** | **F** | **W** | **S** | **S** | **Credits** | **Prerequisites/Notes**
--- | --- | --- | --- | --- | --- | --- | ---
**Fall Term 1**

| | CIS 120 | X | X | X | X | 4 | Digital literacy score or instructor approval |
| | CIS 122 | X | X | X | 4 | MTH 95, placement into WR 121, or instructor approval |
| | CIS 140M | X | X | X | 4 | Digital literacy score, concurrent enrollment, or completion of CIS 120; or instructor approval |
| | WR 121 | X | X | X | X | 4 | WR 115* or placement |

**Winter Term 2**

| | CIS 133CS | X | X | X | 4 | CIS 122 or instructor approval |
| | CIS 240M | X | X | X | 4 | Concurrent enrollment, or completion of CIS 120 or instructor approval; maps to MCSA exam 70-410 |
| | MTH | X | X | X | 4 | MTH 95* (or higher) |
| | WR 122 or WR 227 | X | X | X | X | 4 | WR 121* |

**Spring Term 3**

| | CIS 151C | X | X | X | 4 | CIS 120 or instructor approval |
| | CIS 233CS | X | X | X | 4 | CIS 133CS or instructor approval |
| | CIS 275 | X | X | X | 4 | CIS 133CS or instructor approval |
| | CIS 279M | X | X | X | 4 | CIS 120 or instructor approval; maps to MCSA exam 70-410 |

**Term Offered** | **Course No. and Course Name** | **F** | **W** | **S** | **S** | **Credits** | **Prerequisites/Notes**
--- | --- | --- | --- | --- | --- | --- | ---
**Fall Term 4**

| | CIS 152C | X | X | X | X | 4 | CIS 151C or instructor approval |
| | CIS 195 | X | X | X | 4 | CIS 120 or instructor approval |
| | CIS 276 | X | X | X | 4 | CIS 275 or instructor approval |
| | CIS 280 | X | X | X | X | 4 | Instructor approval; 33 hours=1 credit. Minimum of 2 credits required; maximum of 3 credits allowed. |
| | CIS 288M | X | X | X | 4 | CIS 279M or instructor approval; maps to MCSA exam 70-410 |

**Winter Term 5**

| | CIS 153C | X | X | X | 4 | CIS 152C or instructor approval |
| | CIS 284 | X | X | X | 4 | CIS 152C or instructor approval |
| | CIS 285A | X | X | X | 4 | New course: concurrent enrollment, or completion of CIS 152C or instructor approval |
| | CIS 285B | X | X | X | 4 | New course: CIS 152C or instructor approval Replaces CIS 289M; no longer needed |
| | CIS 295 | X | X | X | 4 | CIS 195, CIS 275, or instructor approval |

**Spring Term 6**

| | CIS 154C | X | X | X | 4 | CIS 153C or instructor approval |
| | CIS 245 | X | X | X | 4 | Second year CIS major or instructor approval |
| | CIS 285C | X | X | X | 4 | New course: CIS 288M or instructor approval |
| | CIS 286A | X | X | X | 4 | New course: CIS 288M or instructor approval |
| | SP 111 | X | X | X | 4 | See current UCC catalog for course prerequisites |

**TOTAL DEGREE CREDITS** | 107 | (cannot exceed 108 credits)**

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**NOTE:** Completion of MTH 95 or placement scores indicating MTH 105 or higher; completion of CIS 120 or placement scores indicating CIS 120; and WR 121 or higher are required for entry into the CIS program.

Faculty Advisor: John Blackwood 541-440-7686 john.blackwood@umpqua.edu
Faculty Advisor: Vincent Yip 541-440-7886 vincent.yip@umpqua.edu

* A grade of "C" or better is required in the indicated course.

**If students choose to vary from this suggested sequence, then prerequisites and term availability must be watched closely because class time conflicts may arise, and/or desired courses may not be available.
<table>
<thead>
<tr>
<th>Course No. and Course Name</th>
<th>Term Offered</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CIS 120 Introduction to CIS</td>
<td>F W S S</td>
<td>4</td>
</tr>
<tr>
<td>CIS 122 Orientation to Programming</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>CIS 140M Intro to Windows OS</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>WR 121 English Comp*</td>
<td>X X X</td>
<td>4</td>
</tr>
<tr>
<td>CIS 133S Networking Essentials (Cisco 1)</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>CIS 233C Intermediate Programming</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>CIS 275 Intro to Database Mgmt. Systems I</td>
<td>X</td>
<td>4</td>
</tr>
<tr>
<td>CIS 279M Microsoft Windows Server Administration I (70-410)</td>
<td>X</td>
<td>4</td>
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<tr>
<td>CIS 152C Intro to Basic Switching &amp; Routers (Cisco 2)</td>
<td>X</td>
<td>4</td>
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<tr>
<td>CIS 195 Authoring for the WWW I</td>
<td>X</td>
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<tr>
<td>CIS 276 Intro to Database Mgmt. Systems II</td>
<td>X</td>
<td>4</td>
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<tr>
<td>CIS 279M Microsoft Windows Server Administration II (70-412)</td>
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<tr>
<td>CIS 153C Intermediate Switching &amp; Routing (Cisco 3)</td>
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<td>4</td>
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<tr>
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<td>X</td>
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<tr>
<td>CIS 295 Authoring for the WWW II</td>
<td>X</td>
<td>4</td>
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<tr>
<td>CIS 154C WAN Protocols (Cisco 4)</td>
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<td>4</td>
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<tr>
<td>CIS 245 Project Management</td>
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<td>4</td>
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<td>PSY 101 Psychology of Human Relations</td>
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<tr>
<td>SP 111 Fundamentals of Public Speaking</td>
<td>X X X</td>
<td>4</td>
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</table>

**TOTAL DEGREE CREDITS** 97

(Cannot exceed 108 credits)

NOTE: Completion of MTH 95 or placement scores indicating MTH 105 or higher; completion of CIS 120 or placement scores indicating CIS 120; and WR 121 or higher are required for entry into the CIS program.

*A grade of "C" or better is required in the indicated course.

Faculty Advisor: John Blackwood 541-440-7686 john.blackwood@umpqua.edu
Faculty Advisor: Vincent Yip 541-440-7886 vincent.yip@umpqua.edu

**If students choose to vary from this suggested sequence, then prerequisites and term availability must be watched closely because class time conflicts may arise, and/or desired courses may not be available.
January 15, 2016

Re: Rational behind introduction of new cybersecurity degree

To Whom It May Concern:

During the 2014-2015 school year, I asked for, and received permission from IC to research and bring forward a new AAS – CIS with an Emphasis in Cybersecurity degree. At that time, we were approached by Mount Hood CC because they wanted an Oregon CC partner for their own, similar degree, which they already offered to students. MHCC needed a partner to obtain the coveted Center for Academic Excellence (CAE2Y), which is granted by the National Security Administration and Department of Homeland Security. MHCC obtained this recognition last year.

MHCC asked UCC to join them because in my previous role as the statewide chair for the “Oregon Council of Computer Chairs,” or OCCC, I recommended that we lobby the Oregon legislature for the funding to create a statewide AAS degree (which the group declined to move forward at the time). Further, I have focused many of my studies and certifications on cybersecurity and have worked with faculty at MHCC as we have pursued some of these trainings and certifications together.

After performing a good amount of research since then, primarily over last summer, but even up until now, adding the new degree seems an easy decision. Cybersecurity knowledge is required in today’s environment and all of the evidence indicates that this trend will continue and deepen.

My research included examining the offerings at MHCC, Anne Arundel CC, Moraine Valley CC, College of Lake County (IL), Red Rocks CC, Hagerstown CC, Northern Virginia CC, Cuyahoga CC, Bellevue College, Clark College, University of Maryland, Carnegie Mellon, NIST-NICE, ACM-CECC, US-CERT, and many other colleges, sources, and people.

Our new degree contains approximately 85% of the courses in the current CIS degree and adds courses in: 1) Ethical Hacking (4 cr); 2) Virtualization using VMware and/or Hyper-V (3 cr); Cloud Services using Amazon Web Services and/or Windows Azure (3 cr); and 4) Advanced Network Device Security, Cisco Security (4 cr). We also allowed for one added hour of CWE to reach the state maximum of 108 credits permitted for an AAS degree.

Best regards,

John Blackwood, MS
Associate Professor
Computer Information Systems
Answers to LMI Worksheet

Program Name: Associate of Applied Science - Computer Information Systems with an emphasis in Cybersecurity

CIP: 52.2101

What are common job titles:
Network and Computer Administrators (151142)
Computer Programmers (151131)
Computer User Support Specialists (151151)
Information Security Analysts (151122)

What occupational title most closely describes:
Network and Computer Administrators (151142)

National percentages:
Males: 86%
Females: 14%

Potential career ladder opps:
Design & implement software and hardware solutions (BS followed by MS); promotion to team leadership; promotion to division leadership (sometimes as a director); promotion to company leadership in VP or Chief Information Officer role.

Minimum educational requirements:
Breadth of knowledge in the field is required for entrance into the job market. However, promotional opportunities beyond those of an entry-level technician usually require an AAS, followed by a BS degree in the field. The MS and/or PhD is not usually required outside of research opportunities or institutions.

Is training available for related career ladder occupations?:

Yes, regional and national educational institutions offer BS, MS and PhD training. Vendors also offer advanced training and certification throughout the US via focused bootcamps and conventions.

Please describe other labor market info that may be relevant:

Most analysts predict that the number of people trained for jobs in the computing industry, especially with training in cybersecurity will fall far short of the employment
demand. There exists a nationwide effort to produce more information systems professionals with training in cybersecurity.

One line of thought, to which I adhere, is that most degree programs emphasize topics within cybersecurity that are not of value to the job-seeking graduate. The idea is that many of these programs focus on the cybersecurity framework (reports, reporting, etc.) and not on the underlying skills that are critical to building the foundation on which advanced topics in cybersecurity can be learned.

In our case, we build a solid information systems foundation in programming, webpage design, database management and programming, Windows desktops and servers, Cisco routers and switches, and virtualization before continuing on to the advanced training in cybersecurity. This ensures that the student learns how these technologies are employed in the real-world as we move to advanced training in these areas.

Lastly, our (three) Windows server, Cisco, and base security courses all lead to industry-recognized certifications, which are: 1) MCSA - Microsoft Certified Solutions Associate: Windows Server 2012; 2) CCNA R & S – Cisco Certified Network Administrator, Routing & Switching; 3) CCNA Security; 4) CompTIA Security+. Possessing any or all of these certifications, along with our AAS degree, positions the student with a strong resume to present to potential employers.

http://www.nist.gov/cyberframework/index.cfm

https://niccs.us-cert.gov/careers/cybersecurity-careers

http://www.aawdc.org/cyber/html/job_seekers_01.html


http://www.techrepublic.com/blog/career-management/are-cybersecurity-bachelors-degrees-worth-the-time/
Please enter your information for the program revision you are proposing below. Your careful attention to the completion of all fields is appreciated. If you are unsure about how to enter something, please contact your Department Chair or Dean.

**Basic Information**

Name of Program Revision Contact:  John Blackwood  
Contact Title:  Faculty  
Department:  Engineering and CIS

**Program Revision Information**

Date, Year, and Term of Proposed Revision:  September 2016, Fall Term  
Program Title:  Computer Information Systems, AAS

**Revision Type - select all that apply**

X_ Credits  
__ Title  
__ Summary  
__ Outcomes  
X_ Curriculum  
__ Suspension  
__ Reactivate  
__ Delete  
X_ Repackage for a new area of concentration or certificate within existing program.  
__ Other:  (please describe)Creates options for parent degree

**Revised Outcomes (If needed)**

**Revision Description and Justification**

*Please give as many details as possible about the revision, including justification for the change.*

Courses in parent program have been revised to maintain degree relevance in changing employment market. Removed accounting (BA 151 or 211; 3 or 4 credits), MS Server III (CIS 289M; 4 credits); added [existing course] Intro to CIS (CIS 120; 4 credits); added [new course] CCNA Security (CIS 285B; 4 credits) to parent degree program. Degree credits increased from 96-97 to 97 credits.

Net changes: Remove 7-8 credits; add 7-8 credits. Net affect is no change in total credits for [base] AAS-CIS degree.

Not on this form, but good to note:  
Also developed one “Option” for Cybersecurity training, which manifests itself in a new AAS and certificate (for current degree holders). The Cybersecurity AAS degree is the same as the CIS degree except that it adds: Optional 1 credit increase for CWE (CIS 280), Ethical Hacking (CIS 285A; 4 credits), Cloud Services Technologies (CIS 285C; 3 credits), and Virtualization Technologies (CIS 286; 3 credits) as new courses. The Cybersecurity AAS degree increases credits to reach the state maximum allowed credits for the AAS degree of 108 credits.
Program Impacts - select all that apply
_ Instructional costs (staff, materials, equipment, or facilities) required.
__ Additional instructional costs (staff, materials, equipment, or facilities) are needed.
X__ Impact to other divisions in terms of classes and staffing
X__ Other: No new courses created for this degree. Only existing courses are part of the base (parent) CIS degree.
Please list changes to program course listing below.

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<tr>
<th>CURRENT</th>
<th>PROPOSED</th>
</tr>
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<tbody>
<tr>
<td><strong>Course #</strong></td>
<td><strong>Course Title</strong></td>
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<tr>
<td>CIS 122</td>
<td>Orientation to Programming</td>
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<td>CIS 140M</td>
<td>Intro to Windows OS</td>
</tr>
<tr>
<td>WR 121</td>
<td>English Comp*</td>
</tr>
<tr>
<td>CIS 133CS</td>
<td>Intro to Programming</td>
</tr>
<tr>
<td>CIS 240M</td>
<td>Install. &amp; Configuring MS Windows Server</td>
</tr>
<tr>
<td>MTH</td>
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<td>Networking Essentials (Cisco 1)</td>
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<td>Intermediate Programming</td>
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<td>Intro to DBMS</td>
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<tr>
<td>CIS 279M</td>
<td>MS Windows Server Admin I</td>
</tr>
<tr>
<td>PSY 101</td>
<td>Psych of Human Relations</td>
</tr>
<tr>
<td>CIS 152C</td>
<td>Intro to Basic Switching (Cisco 2)</td>
</tr>
<tr>
<td>CIS 195</td>
<td>Authoring for the WWW I</td>
</tr>
<tr>
<td>CIS 276</td>
<td>Intermediate DBMS II</td>
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<td>CIS 280</td>
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<td>Course Title</td>
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<td>WAN Protocols (Cisco 4)</td>
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<tr>
<td>CIS 245</td>
<td>Project Management</td>
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<tr>
<td>SP 111</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>BA 151 or BA 211</td>
<td>Practical Accounting I or Principles of Accounting I. Removed from degree.</td>
</tr>
</tbody>
</table>

Current credits for program 96-97

Total credits for Program 97

Additional Documentation

Please check additional forms or documentation you have submitted to Curriculum Committee.

__ Curriculum Revision Form
__ Start-Up and First Year Budget
__ Other:
## Program Revision Form

Program revision for: **Computer Information Systems (CIS), AAS**

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credit(s)</th>
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<th>Course Title</th>
<th>Credit(s)</th>
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Note: Net increase of 0-1 credit hours in CIS program course offerings.
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<td>Total Credits in Program</td>
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</table>

Note: 10-11 credit or 11.3 % change from base; 88.7% of core courses in Cybersecurity option.
January 15, 2016

To Whom It May Concern:

I recommend suspending the AAS – Health Informatics (HI) degree effective Fall 2016.

The rationale behind this decision is based on a few current events and the HI job market in Oregon. When the HI degree was created in 2010-2011, Mercy Medical Center (MMC) maintained an IT staff in Roseburg, which managed its IT and electronic medical record system. However, MMC outsourced its IT functions out of state and no longer maintains an IT department.

Further, just this month we learned that Lane Community College, with whom we have an articulation agreement for four of our required courses, will no longer be offering these courses after this school year concludes. Our enrollment is too low to offer these courses on our campus.

Additionally, even PCC has had difficulty finding adequate employment for its graduates, even though they reside in the state’s largest area of employment for HI.

Lastly, we negotiated a new transfer degree with Oregon Tech in 2015, the AS – Health Informatics option, which we intend to renegotiate annually. Students possessing the 4-year degree stand a much better chance at obtaining gainful employment at graduation and have the option to continue their education at OHSU.

Best regards,

John Blackwood, MS
Associate Professor
Computer Information Systems