|  |  |
| --- | --- |
| **Course Title:**  | **Network Security** |
| **Course Code:** | **411CCN-3** |
| **Program:** | **Computer Networks**  |
| **Department:**  | **Department of Network and communications Engineering**  |
| **College:** | **College of Computer Science and Information Systems** |
| **Institution:** | **Najran University** |

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# A. Course Identification

|  |  |
| --- | --- |
| **1. Credit hours:** | 3 (2, 2, 1) [**Theory, Lab, Tutorial**] |
| **2. Course type** |
| **a.** | University |  | College |  | Department | **✓** | Others |  |  |
| **b.** | Required | **✓** | Elective |  |  |
| **3. Level/year at which this course is offered:** | **Level 6th**  |
| **4. Pre-requisites for this course** (if any)**: 230CCN-3** |
| **5. Co-requisites for this course** (if any)**: NA** |
|  |

## 6. Mode of Instruction (mark all that apply)

| **No** | **Mode of Instruction** | **Contact Hours** | **Percentage**  |
| --- | --- | --- | --- |
| **1** | **Traditional classroom** | 75 | 100% |
| **2** | **Blended**  |  |  |
| **3** | **E-learning** |  |  |
| **4** | **Distance learning**  |  |  |
| **5** | **Other**  |  |  |

**7. Contact Hours** (based on academic semester)

|  |  |  |
| --- | --- | --- |
| **No** | **Activity** | **Contact Hours** |
| **1** | **Lecture** | 30 |
| **2** | **Laboratory/Studio** | 30 |
| **3** | **Tutorial**  | 15 |
| **4** | **Others** (specify) |  |
|  | **Total** | 75 |

# B. Course Objectives and Learning Outcomes

|  |
| --- |
| 1. Course Description This course is designed to provide students with the fundamental skills needed to analyze the security threats against an enterprise network, and to develop strategies that will protect an organization’s information repository. The course covers the information protection techniques deployed in enterprise networks such as VLANs, VPNs and ACLs. The course also contains countermeasures like firewalls and security protocols such as SSL, SSH and IPsec and investigate in detail what makes them secure. |
|  |
| 2. Course Main Objective |
| This course validates skills for installation, troubleshooting, and monitoring of a secure network to maintain integrity, confidentiality, and availability of data and devices. |

## 3. Course Learning Outcomes

| **CLOs** | **Aligned****PLOs** |
| --- | --- |
| 1 | **Knowledge and Understanding** |  |
| 1.1 | Explain the key terminologies and concepts of Network Security. | K2 |
| 1.2 | Explain common network vulnerabilities and attacks, defense mechanisms against network attacks, and cryptographic protection mechanisms. | K1, K2 |
| 1.3 |  |  |
| 1... |  |  |
| **2** | **Skills :** |  |
| 2.1 | Securing Network Devices and Implementing Secure Remote Access. | S4 |
| 2.2 | Design and implementing different types of Secure Networks including: Intrusion Prevention Systems (IPS), Access Control Lists (ACLs), VPNs and VLANs. | S4 |
| 2.3 | Show skills to evaluate the security needs for networked systems and applications. | S1, S6 |
| 2.4 | Implementing network security protocols and firewalls. | S2 |
| 2.5 | Setup different types of Secure Networks using proper network simulator. | S2 |
| **3** | **Values:** |  |
| 3.1 | Recognize professional responsibilities and make informed judgments in network security practice based on legal and ethical principles. | C3 |
| 3.2 |  |  |
| 3.3 |  |  |
| 3... |  |  |

# C. Course Content

|  |  |  |
| --- | --- | --- |
| **No** | **List of Topics** | **Contact Hours** |
| 1 | Introduction to Network Security | 1 |
| 2 | Basic concepts: confidentiality, integrity, availability, security policies, security mechanisms, assurance. | 1 |
| 3 | Authentication, Authorization and Accounting. | 2 |
| 4 | Secret Key Cryptography. | 4 |
| 5 | Hashes and message authentication. | 4 |
| 6 | Security protocols such as IPSec, SSL and SSH. | 8 |
| 7 | Securing Network Devices and Implementing Secure Remote Access.  | 4 |
| 8 | Implementing Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS). | 4 |
| 9 | Understanding and Implementing VLANs. | 8 |
| 10 | Understanding and Implementing Access Control Lists (ACL). | 8 |
| 11 | Understanding and Implementing Firewall Technologies. | 8 |
| 12 | Understanding and Implementing VPNs. | 8 |
| **Total** | 60 |

# D. Teaching and Assessment

## 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

| **Code** | **Course Learning Outcomes** | **Teaching Strategies** | **Assessment Methods** |
| --- | --- | --- | --- |
| **1.0** | **Knowledge and Understanding** |
| 1.1 | CLO\_1: Explain the key terminologies and concepts of data communications and networking. | Lecture | Tests, Quizzes, and Assignments |
| 1.2 | CLO\_2: Illustrate the services and features of the various network layers. | Lecture | Tests, Quizzes, and Assignments |
| … |  |  |  |
| **2.0** | **Skills** |
| 2.1 | CLO\_3: Classify the network protocols, devices, Mediums and types that can be used in a real world network. | Lecture, Lab | Tests, Quizzes, Assignments , and Lab |
| 2.2 | CLO\_4: Analyze the Network Performance Management issues. | Lecture, Lab | Tests, Quizzes, Assignments , and Lab |
| 2.3 | CLO\_5: Design different types of networks based on IP classes and network topologies. | Lecture, Lab | Tests, Quizzes, Assignments , and Lab |
| 2.4 | CLO\_6: Setup different types of network using proper network simulator. | Lecture, Lab | Tests, Quizzes, Assignments , and Lab |
| 2.5 |  |  |  |
| **3.0** | **Values** |
| 3.1 | CLO\_7: Troubleshoot the network errors in real world environment. | Lecture, Lab | Tests,Quizzes, Assignments , and Lab |
| 3.2 |  |  |  |
| … |  |  |  |

## 2. Assessment Tasks for Students

| **#** | **Assessment task\***  | **Week Due** | **Percentage of Total Assessment Score** |
| --- | --- | --- | --- |
| **1** | Quiz and Assignment | TBA | 10% |
| **2** | Midterm Examination 1 | 5th week | 15% |
| **3** | Midterm Examination 2 | 9th week | 15% |
| **4** | Lab Activities | 8th week | 10% |
| **5** | Lab Final Examination | 14th week | 10% |
| **6** | Final Examination | 15th week | 40% |
| **7** |  |  |  |
| **8** |  |  |  |

**\*Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

# E. Student Academic Counseling and Support

|  |
| --- |
| **Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :** |
| 1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (Include amount of time teaching staff are expected to be available each week) During the whole semester, 10 hours/week are reserved for students to guide them, to help them, to explain them topic which is not clear to them etc.  |

# F. Learning Resources and Facilities

## 1.Learning Resources

|  |  |
| --- | --- |
| **Required Textbooks** | * Textbook: Omar Santos John Stuppi, **CCNA Security 210-260 Official Cert Guide,** 2016 Cisco Press.
* Forouzan Behrouz A, 2007, **Cryptography & Network Security,** McGraw-Hill.
 |
| **Essential References Materials** | 1. Darril Gibson, **CompTIA Security+: Get Certified Get Ahead,** Darril Gibson 2017, YCDA, LLC.
 |
| **Electronic Materials** | Available in Blackboard  |
| **Other Learning Materials** |  |

## 2. Facilities Required

| **Item** | **Resources** |
| --- | --- |
| **Accommodation**(Classrooms, laboratories, demonstration rooms/labs, etc.) | Room B-57Laboratory B-41 |
| **Technology Resources** (AV, data show, Smart Board, software, etc.) | data show, PCs. |
| **Other Resources** (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | Network Security Lab |

# G. Course Quality Evaluation

| **Evaluation****Areas/Issues**  | **Evaluators**  | **Evaluation Methods** |
| --- | --- | --- |
| Feedback about Course Learning Outcomes (CLOs) | Students, Faculty | Direct (A course survey is distributed to students to take their opinion) |
| feedback about the teaching strategies, assessment methods, textbooks, instructor | Students | Direct (A course survey is distributed to students to take their opinion) |
| feedback about the teaching strategies, assessment methods, textbooks, instructor | Faculty | Direct (Meeting with course coordinator and college coordinator periodically.) |
| Feedback about Course Learning Outcomes (CLOs) | Students, Faculty | Direct (A course survey is distributed to students to take their opinion) |
|  |  |  |
|  |  |  |
|  |  |  |

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

# H. Specification Approval Data

|  |  |
| --- | --- |
| **Council / Committee** |  |
| **Reference No.** |  |
| **Date** | January 19, 2019  |