# Course Specification
## (Bachelor)

| | |
|---|---|
| Course Title: | Fundamental of Computers Security |
| Course Code: | 177 CIS-3 |
| Program: | Information System |
| Department: | Computer |
| College: | Applied College |
| Institution: | Najran University |
| Version: | Tp – 153- 2024 |
| Last Revision Date: | 2 – 10 - 2024 |

## Table of Contents

## A. General information about the course:

### 1. Course Identification

| 1. Credit hours: ( 3 hours ) | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **2. Course type** | | | | | |
| **A.** | ☐University | ☐College | ☐Department | ☐Track | ☐Others |
| **B.** | ☒ Required | | ☐Elective | | |
| **3. Level/year at which this course is offered: ( level three)** | | | | | |
| **4. Course General Description:** | | | | | |
| **This course provides an in-depth understanding into the fundamental concepts of computer security. It covers basic cryptography, including symmetric and public key cryptosystems as well as key management and distribution and user authentication. It provides an introduction to digital signatures, hash functions, message authentication codes and their application to message and user authentication. The course further focuses on software vulnerabilities and the malware exploiting them** | | | | | |
| **5. Pre-requirements for this course** (if any)**:** | | | | | |
| | | | | | |
| **6. Co-requisites for this course** (if any)**:** | | | | | |
| | | | | | |
| **7. Course Main Objective(s):** | | | | | |
| Course Main Objective(s)<br>**- 1. Define the basic concepts and terminologies of computer security.**<br>**2. Describe types of attacks related to computer/network systems and security services.**<br>**3. Distinguish symmetric and asymmetric cryptographic algorithms and their applications.**<br>**4. Classify user and message authentication algorithms and their applications.**<br>**5. Evaluate different types of malicious software, intrusion detection and prevention methods** | | | | | |

### 2. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | Traditional classroom | 3 hours | 95% |
| 2 | E-learning | | 5% |
| 3 | Hybrid<br>• Traditional classroom<br>• E-learning | | |

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 4 | Distance learning | | |

### 3. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| 1. | **Lectures** | 28 |
| 2. | **Laboratory/Studio** | 28 |
| 3. | **Field** | |
| 4. | **Tutorial** | |
| 5. | **Others (specify)** | |
| **Total** | | 56 |

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| **1.0** | **Knowledge and understanding** | | | |
| 1.1 | Define the concepts of computer security | K1=I | • Lectures,<br>• Brainstorming,<br>• Class Discussion<br>Lab Reports | • Class work<br>• home works assignments<br>• Quizzes<br>• Midterm Exams<br>• Final Exam |
| 1.2 | explain the vulnerabilities of information system as well mitigations to information system attacks. | K2=I | | |
| 1.3 | Describe types of attacks related to computer/network systems and security services | K3=I | | |
| **2.0** | **Skills** | | | |
| 2.1 | Distinguish symmetric and asymmetric cryptographic algorithms and their applications. | S1=M | Lecture<br>•Brainstorming<br>•Small Group Work<br>•Lab Demonstration<br>•Project | home works assignments<br>•Quizzes<br>•Midterm Exams |

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| 2.2 | Evaluate different types of malicious software | S2=M | •Exam<br>•Group Reports<br>•Lab Reports | •Final Exam |
| 2.3 | Classify user and message authentication algorithms and their applications. | S3= M | | |
| **3.0** | **Values, autonomy, and responsibility** | | | |
| 3.1 | Demonstrate projects and assignments in team work for computer security | V 1 =P | • Small group work and presentations | Group reports and presentations |
| 3.2 | Demonstrate projects and assignments in team work for computer security | | | |
| ... | | | | |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| 1. | fundamental concepts of computer security<br>Firewall | 2<br>4 |
| 2. | Cryptographic<br>Introduction to Wireshark | 4<br>4 |
| 3. | Authentication and Authorization<br>Install Wireshark | 4<br>2 |
| 4. | Symmetric & Asymmetric<br>Capture dump file | 4<br>4 |
| 5. | Public key cryptography<br>Wireshark commands | 2<br>2 |
| 6. | Hash Algorithms<br>Lab : MD٤ | 2<br>4 |
| 7. | software vulnerabilities and the malware<br>lab MD5 | 4<br>2 |
| 8. | Malicious software<br>Lab MD5 | 2<br>2 |
| | Intrusion detection and prevention system<br>lab SHA | 2<br>2 |
| **Total** | | |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | Assignment | During semester | 10% |
| 2. | Mid Monthly Exam | 8 | 20% |
| 3. | Practical exam | 14 | 20% |
| 4. | Final exam | End of semester | 50% |
| 5. | Total | | 100% |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

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|---|---|
| **Essential References** | Introduction to Computer Security by Matt Bishop |
| **Supportive References** | William Stallings. Cryptography and Network Security, 5th Edition (Prentice Hall) |
| **Electronic Materials** | Charles P. Pfleeger and Shari L. Pfleeger, Security in Computing, Prentice-Hall |
| **Other Learning Materials** | http://www.uoitc.edu.iq/images/documents/informatics-institute/exam_materials/Introduction%20to%20Computer%20Security%20pdf%20DONE.pdf |

### 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| **facilities** (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Computer Lab with 25 seats + A Lecture room with 30 seats per section |
| **Technology equipment** (projector, smart board, software) | 25 PCs, Data show |
| **Other equipment** (depending on the nature of the specialty) | Oracle/SQL Server Lab |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | Student | Direct: Questioners |
| Effectiveness of Students assessment | Teacher<br>Audit and review committees | Direct: CW & HW Exercises and short quizzes<br>Projects<br>Mid and final paper exams. |
| Quality of learning resources | Teachers and course description committees | Indirect: Benchmarking<br>Self-evaluation<br>External evaluation |
| The extent to which CLOs have been achieved | Teacher | Direct: Measuring the learning outcomes |
| Other | | |

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

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|---|---|
| **COUNCIL /COMMITTEE** | |
| **REFERENCE NO.** | |
| **DATE** | |