



Course Syllabus
According to JORDAN National Qualification
Framework (JNQF)

Course Name: Cloud Computing Security

Course Number: 06044152

General Course Information:

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| Course title | Cloud Computing Security |
| Course number | 06044152 |
| Credit hours | 3 hrs. |
| Education type | Face to Face |
| Prerequisites/corequisites | 0640320 |
| Academic Program | Cyber Security |
| Program code | 604 |
| Faculty | Information Technology |
| Department | Cyber Security |
| Level of course | 3 |
| Academic year /semester | 1 st semester, 4 rd year |
| Awarded qualification | Bachelor |
| Other department(s) involved in teaching the course | Networks |
| Language of instruction | English |
| Date of production/revision | October 19, 2021 |

Course Coordinator:

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|-------------------------------|---------------------------|
| Coordinator's name | Dr. Shadi R Masadeh |
| Office No | 4225 |
| Office Phone extension number | 962 6 4711710 ext. 2405 |
| Office Hours | TBA |
| Email | Shadi.almasadeh@iu.edu.jo |

Other Instructors:

| | |
|-------------------------------|--|
| Instructor name | |
| Office No | |
| Office Phone extension number | |
| Office Hours | |
| Email | |

Course Description (English/Arabic):

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|---------|--|
| English | This course provides the ground-up coverage on the high-level concepts of cloud landscape, architectural principles, techniques, design patterns and real-world best practices applied to Cloud service providers and consumers and delivering secure Cloud-based services. The course will describe the Cloud security architecture and explore the guiding security design principles, design patterns, industry standards, applied technologies and addressing regulatory compliance requirements critical to design, implement, deliver and manage secure cloud-based services.. |
| Arabic | التعرف على المفاهيم عالية المستوى للشبكة السحابية والمبادئ المعمارية والتقنيات وأنماط التصميم وأفضل الممارسات الواقعية المطبقة على موفري الخدمات السحابية والمستهلكين وتقديم خدمات أمنية قائمة على السحابة. بنية أمان السحابة واستكشاف مبادئ تصميم الأمان الإرشادية وأنماط التصميم ومعايير الصناعة والتقنيات المطبقة ومعالجة متطلبات الامتثال التنظيمي الحاسمة لتصميم وتنفيذ وتقديم وإدارة الخدمات الآمنة المستندة إلى السحابة.. |

Textbook: Author(s), Title, Publisher, Edition, Year, Book website.

1. Cloud Computing Security, John R. Vacca, 2016. ISBN: 9781315354927

References: Author(s), Title, Publisher, Edition, Year, Book website.

1. CEH v10 Certified Ethical Hacker Study Guide, Ric Messier, 2019. ISBN: 9781119533191
2. Securing The Cloud: Cloud Computing Security Techniques and Tactics, Vic (J.R.) Winkler, 2011. ISBN: 159749593X, 9781597495936

Course Educational Objectives (CEOs):

| | |
|----|---|
| 1. | Learning the concepts of Cloud Computing and guiding principles for designing and implementing appropriate safeguards and countermeasures for Cloud based IT services |
| 2. | Explain cloud computing threats |
| 3. | Identify security and privacy issues in cloud computing. |
| 4. | Describe the Cloud security architecture and explore the guiding security design principles to manage secure cloud based services. |
| 5. | Understand the industry security standards, regulatory mandates, audit policies and compliance requirements for cloud based infrastructures. |

Intended Learning Outcomes (ILO's):

| 1. | Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire: | Relationship to CEOs | Contribution to PLOs | Bloom Taxonomy Levels* | Descriptors** |
|-------|--|----------------------|----------------------|------------------------|---------------|
| 2. A | Knowledge and Understanding: | | | | |
| 3. A1 | Describe cloud computing concepts | 1 | a,c | 1 | K,C |
| 4. A2 | Understand cloud computing threats and attacks | 2,3 | f | 1 | S |
| 5. A3 | Identify the known risks, vulnerabilities and privacy issues associated with Cloud based IT services. | 2.3.4 | a,f | 1 | K,S |
| 6. B | Intellectual skills: | | | | |
| 7. B1 | Apply cloud computing security measures | 1.5 | a.b.c.f | 2 | K ,S,C |
| 8. C | Subject specific skills: | | | | |
| 9. C1 | List the basics of cloud security requirements and services | 1.5 | a.b.c.f | 3 | S,K,C |
| 10. D | Transferable skills: | | | | |

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|--------|--|--|--|--|--|
| 11. D1 | | | | | |
|--------|--|--|--|--|--|

***Bloom Taxonomy Levels**

| Level # | 1 | 2 | 3 | 4 | 5 | 6 |
|------------|-----------|---------------|-------------|----------|------------|-----------|
| Level Name | Knowledge | Comprehension | Application | Analysis | Evaluation | Synthesis |

**** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

Program Learning Outcome (PLOs):

| Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the () program will demonstrate: | | Descriptors** | | |
|--|---|---------------|---|---|
| | | K | S | C |
| a. | Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. | ✓ | | |
| b. | Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline | | ✓ | |
| c. | Communicate effectively in a variety of professional contexts | | | ✓ |
| d. | Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles. | | | ✓ |
| e. | Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline. | | | ✓ |
| f. | Apply security principles and practices to maintain operations in the presence of risks and threats. [CY] | | ✓ | |
| g. | | | | |
| h. | | | | |

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule (please choose the type of teaching)

■ Face to Face

☐ **Hybrid (2 Lectures Face – To - Face +1 Lecture Asynchronous)**

☐ **Hybrid (1 Lectures Face – To - Face +1 Lecture Asynchronous)**

☐ **Online (2 Lectures Synchronous +1 lecture Asynchronous)**

| Topic | Weeks | Achieved ILOs | DS ** |
|--|-------|---------------|-------|
| Introduction Cloud computing | 1 | A1 | K |
| Characteristics of Cloud Computing | 2 | A1,A2 | K |
| Cloud Computing Models | 3,4 | A1,A2,A3 | K |
| Cloud Computing Security | 5,6 | B1,C1 | C |
| Cloud Computing Threats & Vulnerability | 7,8,9 | A2,A3 | C |
| Cloud Computing Attacks | 10,11 | A2,A3 | S |
| Data Protection for Cloud Infrastructure and Services | 12,13 | B1,C1 | S |
| Enforcing Access Control for Cloud Infrastructure based Services | 14,15 | A3,B1,C1 | S |
| Final exam | 16 | | |

* DS (Descriptors) - K: Knowledge, S: Skills, C: Competency

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Interactive videos
- Practice Labs
- Discussion Forums
- Quizzes
- Other Interactive online activities
- Reports

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.

- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **30%**
- Midterm **20%**
- Final Exam **50%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**


Required equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the IU E-Learning Platform at: <https://elearn.iu.edu.jo/>
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools implemented in the course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others:.....

Responsible Persons and their Signatures:

| | | | |
|----------------------------------|--------------------|----------------|---|
| Course Coordinator | Dr. Shadi Masadeh | Completed Date | 19 / 10 / 2021 |
| | | Signature |  |
| Received by (Department Head) | Dr . Hasan Kanaker | Received Date | / / |
| | | Signature | |