



الجامعة الافتراضية السورية
SYRIAN VIRTUAL UNIVERSITY

Course Definition File

Information System Security

Information

Technology

Engineering



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1. Basic Information:

Course Name	Information System Security
Course Code	BIS601
Number of Presentational Sessions*	20
Number of Synchronous Sessions**	10
Number of Shorter Tests***	2
Number of Exams***	1
Theoretical Sessions Work Load (hrs.)	60
Practical Sessions Work Load (hrs.)	30
Credit Hours	6

*Each presentational session comprises both recorded lecture (1.5 hrs.) and interactive learning content (1.5 hrs.).

**Each synchronous session comprises the interactive lecture carried out in real time in a virtual class (1.5 hrs.).

***Each shorter test is 0.5 hr. long. The final exam is 2 hrs. long.

N.B.

Generally, each chapter requires two presentational sessions: one for the recorded content and one for the interactive content (unless the chapter is too long, in which case it may require more sessions (This note applies to synchronous sessions as well, where each chapter requires one synchronous session generally.

2. Prerequisites courses:

Course	Code
Operating Systems I	BOS501
Database Systems I	BDB501
Computer Networks I	BNT501

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Ethics of Profession and Society	GET601
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3. Course Objectives:

This course provides the student with the essentials of information system security. The student will explore the basics, technologies and tools of this science. The course includes a variety of sections covering information system security over many tracks; starting with cryptography, passing by the most common security issues, and ending with the most important security measures and practices.

4. Learning Outcomes (LO):

- Acquiring the knowledge of the basic concepts in information system security.
- Gaining the ability to use the different cryptographic tools.
- Studying the different types of IT attacks.
- Recognizing the different types of authentication solutions and access control models.
- Acquiring the knowledge of the security solutions dedicated to software, databases, and operating systems.
- Acquiring the knowledge of the security solutions dedicated to intrusion prevention or detection on a single computer or a computer network.

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5. Assessment Results:

Chapter No.	Chapter Title	General Objectives	Assessment Type				
			Interactive Content & Recorded Sessions	Applied Activities (Synch. Sessions)	Final Exam* / Shorter Tests**	Presentations and Interviews****	Reports
CH1	Introduction	Comprehension	√	√	√	√	√
CH2	Cryptosystems	Comprehension – Tools and Application Hands-On	√	√	√	√	√
CH3	User Authentication	Comprehension	√	√	√	√	√
CH4	Access Control	Comprehension	√	√	√	√	√
CH5	Database Security	Comprehension	√	√	√	√	√
CH6	Common Threats	Comprehension	√	√	√	√	√
CH7	Intrusion Detection and Prevention	Comprehension – Tools and Application Hands-On	√	√	√	√	√

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CH8	Software and System Security	Comprehension	✓	✓	✓	✓	✓
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*The final exam is two hours long and is given at the end of the course.

**Shorter tests are about 30 minutes long and are given after three or four lectures throughout the semester during synchronous sessions.

***Presentations, interviews, and reports are submitted once after each three or four lectures throughout the semester during synchronous sessions.

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6. Course Syllabus:

Chapter	Subject	Content	Number of Learning Objects	Number of synchronous Learning Objects
CH1	Introduction	<ol style="list-style-type: none"> 1. Security Concepts 2. Threats and Attacks 3. Functional Requirements 4. Design Principles 5. Security Strategy 	5	2
CH2	Cryptographic Tools	<ol style="list-style-type: none"> 1. Symmetric Encryption 2. Message Authentication 3. Public–Key Encryption 4. Digital Signatures and Key Management 	4	2
CH3	User Authentication	<ol style="list-style-type: none"> 1. User authentication principles 2. Password–based authentication 3. Token–based authentication 4. Biometric authentication 5. Remote authentication 	5	2
CH4	Access Control	<ol style="list-style-type: none"> 1. Access control principles 2. Discretionary access control 3. Role–based access control 	4	2

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		4. Attribute-based access control		
CH5	Database Security	<ol style="list-style-type: none"> 1. SQL injection attacks 2. Database access control 3. Inference attacks 4. Database encryption 5. Data center security 	5	2
CH6	Common Threats	<ol style="list-style-type: none"> 1. Malware classification 2. Malware propagation 3. Malware payload impact 4. Denial of Service 5. Distributed Denial of Service 6. Reflector and amplifier attacks 7. Countermeasures 	7	3
CH7	Intrusion Detection and Prevention	<ol style="list-style-type: none"> 1. Host-based intrusion detection 2. Network-based intrusion detection 3. Firewall characteristics and types 4. Firewall configuration types 5. Intrusion prevention systems 	5	2
CH8	Software and System Security	<ol style="list-style-type: none"> 1. Software Security Issues 2. Handling input/output 3. Writing safe code 4. Operating system security 5. Application security 6. Security maintenance 	7	3

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		7. Cloud and IoT security		
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7. Practical Activity:

- Tools and Labs:

Tool Name	Description
Cryptool	Cryptographic online / offline tool
OpenSSL	Cryptographic / Internet Security tool

- Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH3	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH4	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework	

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	<input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH6	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH7	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	
CH8	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Homework <input type="checkbox"/> Webinars <input type="checkbox"/> Project <input type="checkbox"/> Other	

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8. References:

1. Stallings, W., and L. Brown. "Computer Security: Principles and Practice, Global Edition", 2018.
2. Stallings, William. "Cryptography and network security", 2017.