



# Course Specification

— (Bachelor)

**Course Title:** Advanced cybersecurity programming

**Course Code:** CS1509

**Program:** MS Cybersecurity

**Department:** Computer Science and Engineering

**College:** : Computer Science and information technology

**Institution:** Al-Baha University

**Version:** TP-153

**Last Revision Date:** December 12 , 2023



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: ( 3 )

#### 2. Course type

A.  University  College  Department  Track  Others  
 B.  Required  Elective

3. Level/year at which this course is offered: ( ..... )

#### 4. Course general Description:

This course provides the knowledge and skills related to writing simple scripts and programs for implementing algorithms in order to solve given problems using programming languages according to general guidelines for writing secure software

5. Pre-requirements for this course (if any):

CS1257 (Computer Networks2)

6. Pre-requirements for this course (if any):

#### 7. Course Main Objective(s):

The main purpose for this course is to teach students how to:

- Describe computer security and privacy issues.
- Recognize theoretical underpinnings of computer security and privacy.
- Provide contingency operations that include administrative planning process for incident response and business continuity planning within information security.
- develop skills in many areas including programming and systems analysis, networking, cryptography, security system design, risk assessment and policy analysis, user access issues, investigation techniques, and troubleshooting.
- Communicate concepts and techniques in oral presentations.

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

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	33	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> </ul>		





No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

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

No	Activity	Contact Hours
1.	Lectures	33
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
<b>Total</b>		<b>33</b>

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Design and implement simple programs using secure coding and software design principles	K1	-Lectures -Assignments	-Homework (Rubric) -Midterm exams -Final Exam
1.2	Develop scripts and programs using compound conditions and loops to solve given problems.	K2	-Lectures -Debates/Discussion	-Homework (Rubric) -Midterm exams -Final Exam
1.3	Implement reliable programs considering security requirements	K3	-Lectures -Debates/Discussion -Assignments	-Quizzes -Midterm exams -Final Exam
<b>2.0</b>	<b>Skills</b>			
2.1	Plan for computer security and privacy protection	S1	-Lectures -Assignments -Group Discussion	-Homework (Rubric) -Midterm exams





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			-Case Studies	-Final Exam
2.2	Demonstrate methods, technologies, and solutions for protecting organizations and individuals	S2	-Group Discussion -Case Studies -Assignments	-Homework (Rubric) -Midterm exams -Final Exam
2.3	Communicate concepts and techniques in oral presentations.	S3	-Oral Presentations	-Oral Presentations (Rubric)
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Interact in groups collaboratively	V1	-Small Groups	-Reports (Rubric) -Class discussions(Rubric )

### C. Course Content

No	List of Topics	Contact Hours
1.	Basic Programming Review	3
2.	Introduction to Advanced programming in Cybersecurity	7
3.	Basic Networking Operations	3
4.	Network Security programming	7
5.	Vulnerability Assessment	4
6.	Security Analysis and Scripting	3
7.	Penetration Testing	3
8.	Cybersecurity Tools	3
<b>Total</b>		<b>33</b>

### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework exercises and/or programming assignments	Every two weeks	10%
2.	Report, presentation, and Class discussions	12	10%
3.	Midterm	6	20%



No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Quiz	10	10%
5.	Final Exam	13	50%
6.	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

<b>Essential References</b>	<p>"Introduction to Computer Security," by Matt Bishop, Addison Wesley Professional, 2004.</p> <p>Cryptography &amp; Network Security principle &amp; practices by William Stallings (Forth Editions or Later)</p>
<b>Supportive References</b>	<p>Computer Science Curriculum 2013 – <a href="http://cs2013.org">http://cs2013.org</a></p> <p>ACM (Association for Computer Machinery) Curricula Recommendations -<a href="http://www.acm.org/education/curricula-recommendations">http://www.acm.org/education/curricula-recommendations</a></p>
<b>Electronic Materials</b>	Security Engineering–by Ross Anderson (Second Edition or later)
<b>Other Learning Materials</b>	None

### 2. Required Facilities and equipment

Items	Resources
<p><b>facilities</b></p> <p>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)</p>	<ul style="list-style-type: none"> <li>• A classroom or lecture hall with whiteboard for 25 students.</li> </ul> <p>A digital circuit's laboratory.</p>
<p><b>Technology equipment</b></p> <p>(projector, smart board, software)</p>	<ul style="list-style-type: none"> <li>• A digital image projection system with connection to desktop computer and laptop computer.</li> <li>• High speed Internet connection.</li> <li>• An instructor computer station.</li> </ul>
<p><b>Other equipment</b></p> <p>(depending on the nature of the specialty)</p>	None



## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> <li>● Students</li> <li>● Faculty</li> <li>● Peer Reviewers</li> <li>● Program Leader</li> <li>● Course Coordinator</li> </ul>	<ul style="list-style-type: none"> <li>● Surveys (indirect).</li> <li>● Direct feedback from students (interview between Program leader and students).</li> <li>● Course evaluation by Peer Reviewers (indirect).</li> <li>● Class visit by Program Leader</li> </ul> <p>Comprehensive Course report (where we can find information about teaching difficulties and action plan, ...)</p>
Effectiveness of Students assessment	<ul style="list-style-type: none"> <li>● Students</li> <li>● Faculty</li> <li>● Peer Reviewers</li> <li>● Course Coordinator</li> <li>● Exam Evaluation Committee</li> </ul> <p>Course Coordinator</p>	<ul style="list-style-type: none"> <li>● Surveys (indirect).</li> <li>● Direct feedback from students (interview between Program leader and students ).</li> <li>● Assessment results (direct)</li> <li>● Course evaluation by Peer Reviewers (indirect).</li> <li>● Comprehensive Course report (where we can find information about assessment difficulties and action plan, ...)</li> </ul> <p>Exam evaluation by the Exam Evaluation Committee (indirect)</p>
Quality of learning resources	<ul style="list-style-type: none"> <li>● Students</li> <li>● Faculty</li> <li>● Peer Reviewers</li> </ul> <p>Course Coordinator</p>	<ul style="list-style-type: none"> <li>● Surveys (indirect)</li> <li>● Course evaluation by Peer Reviewers (indirect).</li> </ul> <p>Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, ...)</p>
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> <li>● Faculty</li> <li>● Program Leader</li> <li>● Course Coordinator</li> </ul>	<ul style="list-style-type: none"> <li>● Student Results (direct)</li> </ul>



Assessment Areas/Issues	Assessor	Assessment Methods
		Comprehensive Course report (where we can find the CLO assessment results)
Other	None	None

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

**Assessment Methods** (Direct, Indirect)

### G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	
<b>REFERENCE NO.</b>	
<b>DATE</b>	

