



Course Specification

— (Bachelor)

Course Title: **Software Security**

Course Code: **SE1507**

Program: **Software Engineering**

Department: **Software Engineering**

College: **Faculty of Computer Science and Information Technology**

Institution: **Al-Baha University**

Version: **V1.0**

Last Revision Date: **Axx-April-2024**



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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

3 Credit Hours (3, 0, 0) (Lecture, Lab, Tutorial)
(3 Contact Hours)

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: (8th Level/3rd Year)

4. Course General Description:

This course aims to provide students with an in-depth understanding of the foundations of software security. Students will explore various aspects of software vulnerabilities and attacks that exploit them. Throughout the course, students will explore the techniques for creating secure software i.e. secure design principles, risk analysis, secure application architectures, modeling tools, common software vulnerabilities, assurance techniques, secure programming, code reviews, and security testing.

5. Pre-requirements for this course (if any): Software Design and Development 2 (SE1503)

6. Pre-requirements for this course (if any): None

7. Course Main Objective(s):

The main objective of this course is to understand, analyze, and resolve security issues in networks and computer systems to secure an IT infrastructure. Furthermore, to develop an understanding of the secure measurements to protect networks, secure electronic assets, prevent attacks, ensure privacy, and build secure infrastructures that respect ethical principles.

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"> • Traditional classroom • E-learning 		
4	Distance learning		
5	Other (Lab)		

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)	
Total		33

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Students will be able to analyze and resolve security issues in networks and computer systems to secure an IT infrastructure.	K1	- Lectures	<i>Direct Assessment Tool</i> Midterm Exam Final exam <i>Indirect Assessment Tool</i> Course Exit Survey





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Students will be able to understand the basic software protection mechanism and know how to enable/disable them to build secure software .	K2	- Lectures	Direct Assessment Tool Midterm exam Final exam Indirect Assessment Tool Course Exit Survey
1.3	Students will be able to use the knowledge of software security to design a system to guarantee security .	K3	- Lectures	Direct Assessment Tool Quiz Midterm exam Final exam Indirect Assessment Tool Course Exit Survey
2.0	Skills			
2.1	Demonstrate the basic knowledge of essential concepts of Software Security.	S1	- Lectures - Project	Direct Assessment Tool Project (rubric) Final exam Indirect Assessment Tool Course Exit Survey
2.2	Explain the different software protection mechanisms	S2	- Lectures - Project	Direct Assessment Tool Project (rubric) Final exam Indirect Assessment Tool Course Exit Survey
2.3	Demonstrate the basic knowledge to analyze and resolve security issues in networks and computer systems to secure an IT infrastructure.	S3	- Lectures - Project	Direct Assessment Tool Project (rubric) Final exam Indirect Assessment Tool Course Exit Survey
3.0	Values, autonomy, and responsibility			
3.1	Recognize the importance of teamwork,	V1	-Small Groups	Direct Assessment Tool





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	collaboration, and communication in the design and development of secure software systems. Furthermore the importance of giving and receiving constructive feedback.			Project Presentation (rubric) <i>Indirect Assessment Tool</i> Course Exit Survey

C. Course Content

No	List of Topics (Lectures)	Contact Hours
1.	Introduction: Software Engineering Security	3
2.	Secure Process Life Cycles	3
3.	Secure Development: Secure life cycles, Comparison with traditional methods, Principles of secure software engineering	6
4.	Software Vulnerabilities: Language-based security, Static Analysis	3
5.	Software Security Architecture: Cloud computing, Mobile applications, Web applications	6
6.	Tools: Testing and least common mechanisms, Code Inspection	3
7.	Modeling: Attack trees, Threat Modeling, Risk Analysis	6
8.	Information Assurance	3
Total		33

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	6	20%
2.	Quiz	8	10%
3.	Final Project and Presentation	10	10%
4.	Final Exam	12	60%

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





E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> • Software Security: Building Security In by Gary McGraw. Addison-Wesley, ISBN 978-321-35670-3 • Software Security Engineering: A Guide for Project Managers by Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, and Nancy Mead. Addison-Wesley, ISBN 978-0-32-150917-8 •
Supportive References	<ul style="list-style-type: none"> • ACM (Association for Computer Machinery) Curricula Recommendations • http://www.acm.org/education/curricula-recommendations
Electronic Materials	<ul style="list-style-type: none"> • Access to the Saudi Digital Library (SDL). • Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/).
Other Learning Materials	<ul style="list-style-type: none"> • Nielsen Norman Group: https://www.nngroup.com/

2. Required Facilities and equipment

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

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> • Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator 	<ul style="list-style-type: none"> • Surveys (indirect). • Direct feedback from students. • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader (indirect). • Comprehensive Course report (where we can find





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

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Curriculum Committee
REFERENCE NO.	
DATE	28 April 2024

