هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**Programming 1**
Course Code:	**CS0122**
Program:	**Computer Science (Cybersecurity- Programming- Networks)**
Department:	**Applied Sciences**
College:	**Applied College**
Institution:	**Imam Muhammad Bin Saud Islamic University**
Version:	
Last Revision Date:	October 8, 2024

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3 (2 theory , 2 lab)				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	Level 3				
4. Course general Description: Through this course, the student is introduced to a set of basic skills in object-oriented programming (OOP). This course includes identifying the environment that is used for editing the program (Editing), translating it into machine language, executing it, recognizing and correcting errors, as well as representing data and operations of all kinds, in addition to using sentences, commands, and structural control tools. Throughout the semester, the course includes an integrated case study in which all previous concepts are employed to build an integrated project.					
5. Pre-requirements for this course (if any): CS0118					
6. Co- requirements for this course (if any): N/A					
7. Course Main Objective(s): The course aims to lay the foundation for the basic skills in object-oriented programming for the student to be able to propose solutions to problems so that they are valid for formulation in the form of a computer program.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	4 Hours/Week	100%
2.	E-learning		
3.	Hybrid ● Traditional classroom ● E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	44

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	Familiarity with the basic concepts of object-oriented programming.	K1, K2, K5	• Classroom Lecture • Dialogue and discussion • Survey • Learning by discovery • Self-learning • Developed lecture • Brainstorming • Web polling • KWL Learning Schedule • Mind Maps • Concept Maps	• Traditional and electronic achievement tests • Classroom Questions • Assignments and periodic evaluations • Presentations • Discussion and debate • Cognitive Performance Tests • Achievement File
2.0	Skills			
2.1	Write advanced programs in Java using the basic components of the language.	S1, S2, S3, S4, S7	• Practical presentation • Developed Lecture • Discovery learning • Peer Learning • Self-learning • Dialogue and discussion • Web polling • Brainstorming • Collaborative Learning • Problem solving • Project-Based Learning • Online discussion forums	• Presentations • Grading scales • Performance tests • Production Metrics • Observation • Software Projects • Achievement File • Peer Evaluation • Self-evaluation
2.2	Build a complex data architecture using one and two-dimensional arrays.	S1, S2, S4, S7		
2.3	Use all kinds of operations when writing a program in Java.	S1, S2, S3, S4, S7		
2.4	Use structural control string tools when writing a program in Java.	S1, S2, S3, S4, S7		
2.5	Adjust the mechanism for tracking the progress of the program's implementation.	S1, S2, S7		
2.6	The use of information and communication technology in communication, exchange of ideas, scientific research, and	S1, S2, S7		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	performance of tasks and costs.			
2.7	Practice critical thinking and problem solving facing the learner in the course in creative ways.	S1, S2, S7		
3.0	Values, autonomy, and responsibility			
3.1	Cooperation, teamwork, and imitation of professional ethics.	V1	• Project-Based Learning • Collaborative Learning • Dialogue and discussion • Practical lecture • Modeling and role models • Web polling	• Note cards • Discussion and dialogue • Classroom Questions • Grading metrics • Measures of values • Self-evaluation • Peer Evaluation • Achievement File
3.2	Take responsibility for continuous learning and continued personal development.	V2		
3.3	Manage time efficiently and effectively when applying acquired knowledge and skills.	V3		

C. Course Content

No	List of Topics	Contact Hours
1.	**Chapter 1: Introduction to Java** ● Review concepts in programming. ● Compilers. ● Bugs. ● The basic structure of Java code. ● Components of the Java language: o Language Rules. o Reserved words. o Escape Characters o Variables and constants. o Statements ▪ Declaration Statements ▪ Comments Statements ▪ Input/Output Statements ● Standard Input/Output Statements ● GUI Input/Output Statements o Control statements o Operators	8
2.	**Chapter 2: Operations in Java** ● Operations o Assignment Operations o Arithmetic Operations	12

	o Logical Operations o Relational Operations o Textual Operations o Casting Operations ● Expressions ● Order of precedence	
3.	**Chapter 3: Control Structure - Conditional Statements** ● simple if ● if else ● nested if else ● ?: procedure ● nested conditional ● switch	12
4.	**Chapter 4: Control Structure – Looping and Jumping Statements** ● Looping Statements Tools: ○ for ○ while ○ do while ○ nested loop ● Jumping Statements Tools: ○ break ○ continue ○ return	12
Total		44

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm	Week 7	15%
2.	Quizzes	All Semester	10%
3.	Lab Evaluations	All Semester	30%
4.	Group Project	Week 9	20%
5.	Participation	All Semester	5%
6.	Final Lab Exam	Week 10	20%
	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

Essential References	Deitel P.J., Deitel H.M. - Java. How to Program, 10th Edition
Supportive References	1- Head First Java, by Kathy Sierra and Bert Bates. 2- Java: A Beginner's Guide, by Herbert Schildt. 3- Effective Java: Programming Language Guide (Java Series), by Joshua Bloch.

	4- Simple Program Design, by Lesley Robertson.
Electronic Materials	Online resources will be provided during class lectures.
Other Learning Materials	N/A

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Computer lab
Technology equipment (projector, smart board, software)	Data Show, Smart Board, NetBeans software
Other equipment (depending on the nature of the specialty)	-

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student , Peer Reviewer	1. Questionnaires and referendums approved by the department. 2. Peer evaluation of faculty members. 3. Review the results of student evaluation.
Effectiveness of students assessment	Students, Faculty, Program Leaders, Peer Reviewer	1. Questionnaires and referendums approved by the department. 2. Review course descriptions and course reports periodically. 3. Peer evaluation and periodic exchange of correction and auditing between faculty colleagues. 4. Review samples of students' work.
Quality of learning resources	Student, Faculty, Program Leaders	1. Questionnaires and referendums approved by the department. 2. Deletion and monitoring lists.
The extent to which CLOs have been achieved	Faculty, Program Leaders	1. Review the course report. 2. Analyze test forms, grades and student work and records of their achievements.
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications

Course Title:	Cryptographic
Course Code:	CYB 0104
Program:	Computer Science (Cybersecurity)
Department:	Applied Sciences
College:	Applied College
Institution:	Imam Muhammad Bin Saud Islamic University

Table of Contents

A. Course Identification

1. Credit hours: 3
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Third Semester
4. Pre-requisites for this course (if any)**:** CYB0101
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	3hours\week	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	33

B. Course Objectives and Learning Outcomes

1. Course Description

This course is designed to provide basic identification of replicating that covers classic encryption techniques, cluster encryption standards, data encryption, and basic concepts in the number. Theory. More replica blades such as AES, and flow encryption are covered. The course covers the general key encryption and RSA and some other public keys encryption systems such as Helman's exchange, encryption and elliptical curve system. Reserved retail functions are also covered for data safety in the course, by describing how the encryption block sequence can be used and understanding SSL and TLS. In addition, this course illustrate the Public channel cryptography and Modern Cryptography in information security field of study.

2. Course Main Objective

Give a deep understanding about the cryptography and the types used in different information. Understand the different between the symmetric and asymmetric encryption techniques. Also, students should differentiate between security transport and the modern cryptography.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Understand the different cryptographic types.	ع1,ع3
1.2	To expose students to the importance of cryptographic.	ع3
1.3	Identify different types of cryptographic, classify the threats and develop a security model to prevent, detect and recover from the attacks.	ع2,ع5
2	**Skills :**	
2.1	Encrypt and decrypt messages using block ciphers, sign and verify messages using well known signature generation and verification algorithms.	م2,م1
2.2	Analyze existing authentication and key agreement protocols.	م5,م7
2.3	Develop SSL or Firewall based solutions against security threats, employ access control techniques to the existing computer platforms such as Unix and Windows NT.	م6
3	**Values:**	
3.1	Implement hacking and encrypting to protect systems.	م7,ق1,ق2,ق3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction	3
2	Hash Function	3
3	Authenticated encryption	3
4	Key Exchange	3
5	Asymmetric encryption and hybrid encryption	3
6	Public channel cryptography	3
7	Modern Cryptography	3
8	Signature proofs	4
9	Secure transport	4
10	User authentication	4
Total		33

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Understand the different cryptographic types.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		Quizzes Case studies and Analysis.	
1.2	To expose students to the importance of cryptographic.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
	Identify different types of cryptographic, classify the threats and develop a security model to prevent, detect and recover from the attacks.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.0	**Skills**		
2.1	Encrypt and decrypt messages using block ciphers, sign and verify messages using well known signature generation and verification algorithms.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.2	Analyze existing authentication and key agreement protocols.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.3	Develop SSL or Firewall based solutions against security threats, employ access control techniques to the existing computer platforms such as Unix and Windows NT.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.0	**Values**		
3.1	Implement hacking and encrypting to protect systems.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week3,5	10%
2	Midterm	Week 7	20%
3	Lab Assignments group or individual /Class Assignments group or individual	Week4,7,9	15%
4	Lab Evaluations	All Semester	25%
5	Final	Week12	30%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

6 office hours per week.
3 hours of weekly meetings
Contact through the LMS
Communication/interact via e-mails with students

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Real world Cryptography,2021, by David Wong. The Mathematics of Encryption,2021, By Margaret Cozzens, Steven J. Miller
Essential References Materials	N/A
Electronic Materials	Online resources will be provided during class lectures.
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture room with Smart board Lab with 25 Pcs
Technology Resources (AV, data show, Smart Board, software, etc.)	PC and WiFi Internet access within the class room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	N\A

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Student	Indirect using course evaluation survey
Quality of learning resources	Student and Faculty	Indirect using course evaluation and faculty survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Cybersecurity Design Principles
Course Code:	CYB 0105
Program:	Computer Science (Cybersecurity)
Department:	Applied Sciences
College:	Applied College
Institution:	Imam Muhammad Bin Saud Islamic University

Table of Contents

A. Course Identification

1. Credit hours:	**3**
2. Course type	
a.	University ☐ College ☐ Department ☑ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	First Semester
4. Pre-requisites for this course (if any)**:**	CYB0101
5. Co-requisites for this course (if any)**:**	None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	3hours\week	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	33

B. Course Objectives and Learning Outcomes

1. Course Description

This unit includes knowledge and skills related to the basics of design Security To design secure and reliable cyber systems.

2. Course Main Objective

This course will concentrates on improving the skills related to design security systems, where the system should be designed in a protected level of it implementing Separation of duties and Insulation. Furthermore, the designing should combine elements together into one component And it must be simple. In addition, the design should reduce implementation with Multi-layer security defense design and open design and Full settlement. However, the system must concentrates on access permissions, safety and security mode in case of malfunctions and, minimize surprises in device performance. The design should be easy to use and all programming patterns used are secured.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Expressing the principles of safe design.	1ع
1.2	Understand the importance of cybersecurity design principles and the impact of each principle on design trusted systems.	2ع،5ع
2	**Skills :**	
2.1	Distinguish the design principle that has been violated for each of the weaknesses common security in systems.	1م
2.2	Analyze the cybersecurity design principles that are required in specific settings.	6م
3	**Values:**	
3.1	Apply cybersecurity design principles to uncomplicated programs and/or systems	2ق

C. Course Content

No	List of Topics	Contact Hours
1	The basics and importance of the safe design of programs and systems	3
2	Separation of duties and Insulation	3
3	Combine elements together into one component	3
4	Modular design and Simplicity in design with Full settlement	3
5	Reduce implementation with Multi-layer security defense design	3
6	Models of systems security levels and access permissions	3
7	Safety and security mode in case of malfunctions	3
8	Minimize surprises in device performance	6
9	Reducing the level of trust with ease of use and safe programming patterns	6
Total		33

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Expressing the principles of safe design.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports.
1.2	Understand the importance of cybersecurity design principles and the impact of each principle on design trusted systems.	Class lectures Class Discussion Questions/Answers sessions in class Home work	Quizzes Homework and Assignments. Written exams (Midterm and final).

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		assignments Quizzes Case studies and Analysis.	Writing reports. Study cases.
2.0	**Skills**		
2.1	Distinguish the design principle that has been violated for each of the weaknesses common security in systems.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
2.2	Analyze the cybersecurity design principles that are required in specific settings.	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.
3.0	**Values**		
3.1	Apply cybersecurity design principles to uncomplicated programs and/or systems	Class lectures Class Discussion Questions/Answers sessions in class Home work assignments Quizzes Case studies and Analysis.	Quizzes Homework and Assignments. Written exams (Midterm and final). Writing reports. Study cases.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week3,5	10%
2	Midterm1	Week 6	15%
3	Midterm2	Week8	15%
4	Lab Assignments group or individual /Class Assignments group or individual	Week4,7,9	10%
5	Lab Evaluations	All Semester	20%
6	Final	Week12	30%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

6 office hours per week.
3 hours of weekly meetings
Contact through the LMS
Communication/interact via e-mails with students

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Secure By Design 1st Edition,Danial Deogun, Dan Bergh Johnsson (Author), Daniel Sawano (Author), ISBN-13: 978-1617294358 ISBN-10: 1617294357
Essential References Materials	N/A
Electronic Materials	Online resources will be provided during class lectures.
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture room with Smart board Lab with 25 Pcs
Technology Resources (AV, data show, Smart Board, software, etc.)	PC and WiFi Internet access within the class room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	N\A

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Student	Indirect using course evaluation survey
Quality of learning resources	Student and Faculty	Indirect using course evaluation and faculty survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	