2023
TP-153

Course Specification
(Bachelor)

Course Title:	Design Patterns
Course Code:	SE1767
Program:	Bachelor of Software Engineering
Department:	Software Engineering
College:	Faculty of Computers and Informatics
Institution:	Al-Baha University
Version:	1.0
Last Revision Date:	23/4/2024

Table of Contents

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: (12)					
4. Course general Description:					
This course allows the students to explore theoretically and practically various types of software design patterns in object-oriented paradigm. Students will be able to understand the use of design patterns and explore various design patterns catalogs. Main catalog will be Gamma's catalog which divides the patterns into 11 creational, structural, and behavioral. Furthermore, other design patterns will be studied and investigated such as security design patterns.					
5. Pre-requirements for this course (if any)**:**					
Software Design and Development 2 (SE1503)					
6. Pre-requirements for this course (if any)**:**					
7. Course Main Objective(s):					
The main aim of this course is to teach the students the concepts of software design patterns. This includes different types of design patterns which will be practically implemented and investigated by students on their projects.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	E-learning	0	0
3	Hybrid	0	0

No	Mode of Instruction	Contact Hours	Percentage
	• Traditional classroom • E-learning		
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	33
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
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	**Illustrate understanding of the concepts of software design patterns and their use**	**K1**	**Lecture, Exercise**	**Quizzes, Exams, Assignments**
1.2	**Distinguish the different architectural of software design patterns**	**K2**	**Lecture, Exercise**	**Quizzes, Exams, Assignments**
1.3	**Recognize other software design patterns such as security design patterns**	**K3**	**Lecture, Exercise**	**Quizzes, Exams, Assignments**
2.0	**Skills**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Implement different software design patterns in real object-oriented system	S1	Lecture, Group discussion, tutorials	Exams, assignments, project
2.2	Demonstrate ability to Select the appropriate software design patterns depending on the needs, and to evolve software design accordingly	S2	Lecture, Group discussion, tutorials	Exams, assignments, project
2.3	Apply reporting and presentation on a software design patterns implementation	S3	Lecture, Group discussion, tutorials	Exams, assignments, project
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork	V1	Project	Assignment, project

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to software design patterns and object-oriented paradigm	4
2.	UML diagrams Structure Diagrams: Class Diagram, Component Diagram, Composite; Behavioral Diagrams: Use Case Diagram, Activity Diagram, State Machine Diagram, Sequence Diagram, Communication Diagram	6
3.	Design patterns catalogs: Gamma catalog and other catalogs	4
4.	Creational patterns: Abstract factory, Builder, Factory, Prototype, Singleton.	4
5.	Structural patterns: Adapter, Bridge, Composite, Decorator, Facade, Flyweight, Proxy.	6
6.	Behavioral patterns: Chain of responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template method, Visitor.	6

7.	Software security design patterns	3
Total		33

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments and Quizzes	2,4,6,8	15%
2.	Group Project	10	15%
3.	Midterm Exam	5	20%
3.	Final Exam	11	50%

*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	Gamma, Erich, et al. Design patterns: elements of reusable object-oriented software. Pearson Deutschland GmbH, 1995.
Supportive References	N/A
Electronic Materials	N/A
Other Learning Materials	N/A

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (projector, smart board, software)	Software and Tools
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	- Survey
Effectiveness of	Lecturer	- Annual report

Assessment Areas/Issues	Assessor	Assessment Methods
Students assessment		
Quality of learning resources	Program Coordinator	- Survey - Evaluation of test Models - Standard sample
The extent to which CLOs have been achieved		
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

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