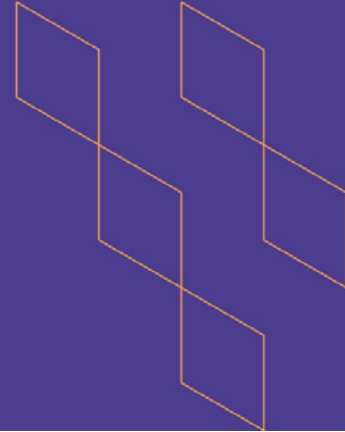




T-104
2022

Course Specification



Course Title: Advanced Programming and Design Patterns
Course Code: CS1514
Program: Computer Science
Department: Computer Science & Engineering
College: Computer Science and Information Technology
Institution: Al Baha University
Version: v1.2
Last Revision Date: 04-4-2023



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A. General information about the course:

Course Identification	
1. Credit hours:	3
2. Course type	
a.	University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Track <input type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered: 6/2	
4. Course General Description The purpose of this course is to provide students with advanced practices of programming including database programming and multithreading. It introduces students to design patterns which is a general repeatable solution to a commonly occurring problem in software design.	
5. Pre-requirements for this course (if any): Programming 2 (CS1251)	
6. Co- requirements for this course (if any): --	
7. Course Main Objective(s)	
<ul style="list-style-type: none"> To understand advanced programming concepts and techniques including database programming and multithreading. To develop skills in designing and implementing software using design patterns. To apply advanced programming and design principles to solve real-world problems. Work both independently and collaboratively. 	

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	22	50%
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4.	Distance learning		
5.	Lab	22	50%

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 the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recall the methods/functions used in database programming.	K1	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Midterm exam Final Exam
1.2	Define the principles and benefits of design patterns.	K1	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Midterm exam Final Exam
1.3	Describe how design patterns can be applied to solve software design problems.		<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Midterm exam Final Exam
2.0	Skills			
2.1	Develop software applications using advanced programming techniques.	S1	<ul style="list-style-type: none"> Tutorials Lectures Problem-based learning Project 	<ul style="list-style-type: none"> Project (rubric) Assignment (rubric) Final Exam
2.2	Analyze real-world problems that can be designed following a design pattern technique.	S1	<ul style="list-style-type: none"> Tutorials Lectures Case study Assignment 	<ul style="list-style-type: none"> Assignment (rubric) Final Exam
2.3	Code a program that adopt a design pattern	S1	<ul style="list-style-type: none"> Tutorials Lectures Case study Project Problem-based learning 	<ul style="list-style-type: none"> Project (rubric) Final Exam
3.0	Values, autonomy, and responsibility			
3.1	Work both independently and collaboratively.	V1	<ul style="list-style-type: none"> Project Assignments 	<ul style="list-style-type: none"> Rubric



C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to advanced programming concepts and techniques	2
2.	Database Programming	8
3	Multithreading	6
4	Introduction to design patterns	4
5	Creational patterns	8
6	Structural patterns	8
7	Behavioural patterns	8
Total		44

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam	5	20%
2.	Assignments/Discussions	Periodically	20%
3.	Project/Presentation	10-11	20%
4	Final exam	13	40%

*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"> - "Introduction to Java Programming, Comprehensive" by D. Liang, Pearson, 2015. - "Head First Design Patterns" by Elisabeth Freeman and Eric Freeman, O'Reilly Media, 2020
Supportive References	<ul style="list-style-type: none"> “Introduction to Java Programming and Data Structures, Comprehensive Version” by D. Liang, Pearson, 2019. - "Design Patterns: Elements of Reusable Object-Oriented Software" by G. Erich, H. Richard, J. Ralph et. al., Addison-Wesley Professional.
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"> • none

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	All the lectures should be in a well-prepared lab that can accommodate 25 students at most.



Items	Resources
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> A digital image projection system with a connection to a computer. High-speed Internet connection. An instructor computer station. An application to manage labs and learning sessions (e.g. NetSupport School).
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching		
Effectiveness of students' assessment	<ul style="list-style-type: none"> Students Exam Evaluation Committee Course Coordinator 	<ul style="list-style-type: none"> Survey (indirect) Exam Review (direct) Review of course file (direct)
Quality of learning resources	<ul style="list-style-type: none"> Faculty Students 	<ul style="list-style-type: none"> Survey (indirect)
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> Faculty Program Leaders or Course Coordinator 	<ul style="list-style-type: none"> Exams (direct) Exit Exams (direct)
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

