Course Outline	
COMP6122 Framework Layer Architecture (2/2)	**Study Program** Computer Science
Effective Date 01 September 2016	**Revision** 0

1. Course Description

This course introduces the concepts and practice related to design pattern and its implementation in web technology. This topic course include: First Five Principle Object Oriented Design, Basic Design Pattern Concept, Using UML with Design Patterns, Factory Method Design Pattern, Prototype Design Pattern, Adapter Pattern, Decorator Pattern, Template Method Pattern, State Design Pattern, Proxy Pattern, Strategy Pattern, Chain of Responsibility Pattern and PHP, Java Web Technology Introduction

2. Graduate Competency

Each course in the study program contributes to the graduate competencies that are divided into employability and entrepreneurial skills and study program specific outcomes, in which students need to have demonstrated by the time they complete their course.

BINUS University employability and entrepreneurial skills consist of planning and organizing, problem solving and decision making, self management, team work, communication, and initiative and enterprise.

2.1. Employability and Entrepreneurial Skills

Aspect	Key Behaviour

2.2. Study Program Specific Outcomes

Study Program Specific Outcomes
Able to classify problems and to apply design and development principles for specific problems
Able to depict trend mobile technologies in the future
Able to construct a solution by applying current technologies
Able to classify criteria and specifications appropriate to specific problems, plan strategies for their solution and construct software system development

3. Topics

- Principles of Object Oriented Design
- PHP and Java Web Technology Introduction
- Basic Design Pattern Concept
- Using UML with Design Patterns
- Creational Design Patterns: Factory Method Design Pattern
- Creational Design Patterns: Prototype Design Pattern
- Structural Design Pattern: Adapter Pattern
- Structural Design Pattern: Decorator Pattern
- Behavioral Design Patterns: Template Method Pattern
- Behavioral Design Patterns: The State Design Pattern
- Proxy Pattern for Connector Database
- Flexibility of Strategy Design Pattern
- The Chain of Responsibility Design Pattern

4. Learning Outcomes

On successful completion of this course, student will be able to:

- LO 1: Describe use of design pattern in web technology
- LO 2: Design object oriented in design pattern
- LO 3: Apply design pattern in web technology

5. Teaching And Learning Strategies

In this course, the lecturers might deploy several teaching learning strategies, including case studies, Demonstration, and Group Assignments.

6. Textbooks and Other Resources

6.1 Textbooks

1. William Sanders. (2013). ***Learning PHP Design Patterns***. 03. O'Reilly Media. New York. ISBN: 9781449344917.

The book in the first list is a must to have for each student.

6.2 Other Resources

1. http://lmscontent.binus.ac.id/digitalcontent/COMP6122 - framework layer architecture.zip
2. https://sourcemaking.com/design_patterns

7. Schedule

Theory

Session/ Mode	Related LO	Topics	References
1 F2F	LO 1	Principles of Object Oriented Design - Single-responsiblity principle - Open-closed principle - Liskov substitution principle - Interface segregation principle - Dependency Inversion Principle	- First Five Principle Object Oriented Design - Principles of Object Oriented Design, http://lmscontent.binus.ac.id/digitalcontent/COMP6122 - framework layer architecture.zip
2 F2F	LO 1	PHP and Java Web Technology Introduction - Java Web Introduction - Java Object Oriented in Web Programming - PHP Introduction - PHP Object Oriented in Web Programming	- PHP and Java Web Technology
3 GSLC	LO 1	Basic Design Pattern Concept - The MVC Looseb and Refocuses Programming - Basic Principles of Design Patterns - Design Patterns as a Big Cheat sheet - Choosing a design pattern	- Basic Design Pattern Concept - Design Pattern Introduction, https://sourcemaking.com/design_patterns
4 F2F	LO 1 LO 2	Using UML with Design Patterns - Why UML - Class Diagram - Participant Symbols - Relationship Notations - Object Diagrams - Interaction Diagrams - The Role of Diagrams and Notations in OOP - Tools for UML	- Using UML with Design Pattern
5 F2F	LO 2	Creational Design Patterns: Factory Method Design Pattern - Factory Method Pattern - When to use Factory Method - Factory Method Examples - Acommodating Class Change	- Factory Method Design Pattern

6 F2F	LO 2	Creational Design Patterns: Prototype Design Pattern - Prototype Design Patterns Introduction - When to use the prototype pattern - The Clone Function - Prototype Pattern Example	- Prototype Design Pattern
7 F2F	LO 2	Structural Design Pattern: Adapter Pattern - Adapter Pattern Introduction - When to use the adapter pattern - The Adapter Pattern Using Inheritance - The Adapter Pattern Using Composition	- Adapter Design Pattern
8 F2F	LO 2	Structural Design Pattern: Decorator Pattern - What is the decorator pattern - When to use the decorator pattern - Decorator Pattern Example - Decorator Wrapper - Decorator with Multiple Components - HTML User Interface	- Decorator Pattern
9 GSLC	LO 2	Behavioral Design Patterns: Template Method Pattern - Template Method Pattern Introduction - When to use the template method - Using the template method with Images and Captions - The Client - The Hollywood Principle - Using template method with other design patterns - Factory Method Participants - The Hook in the template method design pattern - The Small and Mighty Template Method	- Template Method Pattern
10 F2F	LO 2	Behavioral Design Patterns: The State Design Pattern - State Design Pattern Introduction - When to use State Pattern - State Machine - State Design Pattern Example - Adding State - State Navigator	- State Design Pattern
11 F2F	LO 2 LO 3	Proxy Pattern for Connector Database - A Simple Interface and Class for MySQL - The protection proxy for Login	- Proxy Pattern
12 F2F	LO 2 LO 3	Flexibility of Strategy Design Pattern - Encapsulating Algorithms - Strategy Pattern Example - Expanded Strategy Pattern with Data Security and Parameterized - The Flexible Strategy Pattern	- Strategy Pattern
13 F2F	LO 2 LO 3	The Chain of Responsibility Design Pattern - Passing the Buck - The Chain of Responsibility in MySQL HelpDesk - Automated Chain of Responsibility and Factory Method - Ease of Update	- Chain of Responsibility Pattern

Practicum

Session/ Mode	Related LO	Topics	References
1 F2F	LO 1	Review Object Oriented - Object Oriented Programming - Design Pattern Introduction	- Review Object Oriented
2 F2F	LO 1 LO 2	Creational Design Pattern - Singleton & Factory - Singleton - Factory	- Creational Design Pattern - Singleton & Factory
3 F2F	LO 1 LO 2	Creational Design Pattern - Builder and Prototype - Builder Pattern - Prototype Pattern	- Creational Design Pattern - Builder and Prototype
4 F2F	LO 1 LO 2	Creational Design Pattern - Abstract Factory - Abstract Factory Pattern	- Creational Design Pattern - Abstract Factory
5 F2F	LO 1 LO 2	Structural Design Pattern - Adapter - Adapter Pattern	- Creational Design Pattern - Adapter
6 F2F	LO 1 LO 2	First Quiz - First Quiz	- First Quiz
7 F2F	LO 2 LO 3	Structural Design Pattern - Facade - Facade Pattern	- Structural Design Pattern - Facade
8 F2F	LO 2 LO 3	Structural Design Pattern - Proxy - Proxy Pattern	- Structural Design Pattern - Proxy
9 F2F	LO 2 LO 3	Behavioral Pattern - Observer - Observer Pattern	- Behavioral Pattern - Observer
10 F2F	LO 2 LO 3	Behavioral Pattern - Mediator & Iterator - Mediator Pattern - Iterator Pattern	- Behavioral Pattern - Mediator & Iterator
11 F2F	LO 2 LO 3	Behavioral Pattern - State & Template Methods - State Pattern - Template Methods Pattern	- Behavioral Pattern - State & Template Methods
12 F2F	LO 3	Second Quiz - Second Quiz	- Second Quiz

8. Evaluation

Theory

Assessment Activity	Weight	Learning Outcomes		
		1	2	3
Assignment	20%	√	√	√
Mid Exam	30%	√	√	
Final Exam	50%	√	√	√

Practicum

Assessment Activity	Weight	Learning Outcomes		
		1	2	3
Quiz	100%	√	√	√

Final Evaluation Score

Aspects	Weight
Theory	70%
Practicum	30%

9. A. Assessment Rubric (Study Program Specific Outcomes)

LO	Indicators	Proficiency Level			
		Excellent (85 – 100)	**Good (75 – 84)**	**Average (65 – 74)**	**Poor (<= 64)**
LO 1	1.1. Able to describe use of design pattern in web technology with detail and appropriate example	Able to describe use of design pattern in web technology with detail and appropriate example	Able to describe use of design pattern in web technology but not detail and appropriate example	Able to describe use of design pattern in web technology but not detail and not appropriate example	Not able to describe use of design pattern in web technology with detail and appropriate example
LO 2	2.1. Able to design object oriented in design pattern with detail and appropriate example	Able to design object oriented in design pattern with detail and appropriate example	Able to design object oriented in design pattern with less detail and appropriate example	Able to design object oriented in design pattern with less detail and not appropriate example	Not able to design object oriented in design pattern with detail and appropriate example
LO 3	3.1. Able to apply design pattern in web technology with correct detail construct and appropriate example	Able to apply design pattern in web technology with correct detail construct and appropriate example	Able to apply design pattern in web technology with less correct detail construct and appropriate example	Able to apply design pattern in web technology with less correct detail construct and not appropriate example	Not able to apply design pattern in web technology with correct detail construct and appropriate example

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