COURSE INFORMATION

School/Faculty:	Department of Software Engineering / Faculty of Computing	Page:	1 of 6	
Program name:	Bachelor of Computer Science (Software Engineering) with Honours			
Course code:	SECJ 3623	Academic Session/Semester:		20252026/1
Course name:	Mobile Application Programming	Pre/co requisite (course name and code, if applicable):		Object-Oriented Programming (SECJ 2154)
Credit hours:	3			

Course synopsis	This course is designed to give students a foundation on the development of applications for mobile devices. It will cover the workflows, tools and frameworks required to develop applications for current and emerging mobile computing devices. The course will adopt a current technology as a basis for teaching the process of mobile application development. This course will also expose the students to composing user interfaces for mobile, integrating with backends and the software architecture for the mobile application and the backends. At the end of the course, students should be able to work collaboratively in developing working data-centric mobile applications.			
Course lecturer(s)	**Name**	**Section**	**Office**	**Email**
	AP Dr. Mohd Shahizan Othman			shahizan@utm.my

Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO	PLO (Code)	**Taxonomies and ***generic skills	T&L methods	****Assessment methods
CLO 1	Explain the components for the development of mobile applications and their roles.	KW	*C2	Learning, Project-Based Learning	Biz Canvas, Pitching, Backlog
CLO 2	Contrast and select the combination of suitable components to develop a working system, based on the understanding of the components and structure of the mobile development frameworks.	PS	*C4	Lecture, Project-Based Learning	Final Exam, Project Sprints
CLO 3	Build a good relation and understand one's role and take responsibility interchangeably among group's leader and members in executing a mobile application project.	TW	*P2 **TW1, TW2	Group Discussion, Project-Based Learning	Note of Discussion

Prepared by:		Certified by:	
Name:	AP Dr. Hishammuddin bin Asmuni	Name:	
Signature:		Signature:	
Date:	05 March 2025	Date:	

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Details on Innovative T&L practices:

No.	Type	Implementation
1.	Project-based learning	Conducted through a group project (4 students per group). The project is divided into several deliverables.

Weekly schedule:

Week 1	**1.0 Introduction and Environment Setup** Learning Objectives ● Understand the fundamentals of cross-platform development and where Flutter fits in. ● Install and configure Flutter SDK and development tools (Android Studio, VS Code). ● Create and run the first Flutter app. **Topics:** 1.1 Introductory to Course 1.2 Mobile Application Development Technologies: Platform-specific vs. Cross-platform 1.3 Framework Setup 1.4 Installing Software, Tools, and Emulators 1.5 Test drive on an emulator and a real device 1.6 Introduction to Git	
Week 2 & 3	**2.0 Dart Basics and Introduction to Flutter** Learning Objectives ● Become comfortable with Dart syntax and fundamental concepts. ● Understand Flutter's Widget-based architecture. ● Build a simple interface with basic widgets. **Topics:** 2.1 Dart basics: Variables, data types, functions, classes 2.2 Control flow (if-else, loops) 2.3 Introduction to Widgets in Flutter (Stateless vs. Stateful) 2.4 Basic widgets: Text, Container, Row, Column, Image, Icon	**Submission: Lean Biz Canvas (**Week 2)
Week 4	**3.0 Layouts and Navigation** Learning Objectives ● Learn how to arrange widgets efficiently with Flutter's layout widgets. ● Use Navigator to switch between screens/pages. ● Practice common layout patterns. **Topics:** 3.1 Layout widgets: Expanded, Flexible, ListView, Stack	**Presentation: Project Pitching** **Submission: Project Backlog**

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	3.2 Material vs. Cupertino design 3.3 Navigation fundamentals: Navigator.push, Navigator.pop 3.4 Routing techniques: named routes vs. direct routes	
Week 5	**4.0 Forms, Input and Validation** Learning Objectives ● Create interactive forms using Flutter's built-in widgets. ● Implement form validation and error handling. ● Handle user input effectively and manage focus, keyboard, etc. **Topics:** 4.1 TextField and TextFormField 4.2 Form validation with Form and FormField 4.3 Validation logic and custom validators 4.4 Focus management and keyboard handling	

Week 6 & Week 7	**5.0 App Architecture & Best Practices**
	Learning Objectives
	● Understand architectural patterns (MVC, MVVM, Clean Architecture) in the context of Flutter.
	● Organize larger projects for scalability and maintainability.
	● Implement best coding practices, folder structures, and design patterns.
	
	Topics
	    5.1 Folder structure and modular approach
	    5.2 Clean Architecture for Flutter
	    5.3 Code review practices
	    5.4 Implementation of MVVM	

Week 8	Mid Semester Break	
Week 9 & Week10	**6.0 State Management** Learning Objectives ● Understand the concept of state in Flutter. ● Learn different approaches to managing state (setState, InheritedWidget, Provider). ● Decide when to use various state management approaches for simpler applications. **Topics:** 6.1 setState & the StatefulWidget lifecycle 6.2 InheritedWidget / InheritedModel	**Presentation: Project Sprint 1**

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	6.3 Introduction to Provider for state management 6.4 Lifting state up vs. global state 6.5 Explore more robust state management solutions for scaling apps.	
Week 11 & 12	**7.0 Firebase Integration** Learning Objectives ● Integrate Firebase for real-time database, authentication, and more. ● Set up a Flutter project with Firebase. ● Implement user authentication (login, sign-up). **Topics** 7.1 Firebase setup (Android configs) 7.2 Realtime Database or Firestore basics 7.3 Firebase Authentication (email/password, social logins) 7.4 Basic security rules and best practices	**Presentation: Project Sprint 2 (Week 11)**
Week 13	**8.0 Networking and APIs** Learning Objectives ● Fetch data from remote APIs. ● Parse JSON data and integrate into the UI. ● Handle asynchronous operations and manage network states (loading, error, success). **Topics:** 8.1 HTTP requests in Flutter (http package) 8.2 Asynchronous programming (Futures, async/await) 8.3 Parsing JSON (manual vs. using packages like json_serializable) 8.4 Error handling & data loading indicators	**Presentation: Project Sprint 3 (Week 13)**
Week 14	**9.0 Persistent Storage (Local Database & Preferences)** Learning Objectives ● Store and retrieve data locally using SQLite. ● Work with shared preferences for small data (e.g., settings, user prefs). ● Understand data persistence strategies for offline capabilities. **Topics:** 9.1 Using sqflite package for local databases 9.2 CRUD operations with SQLite 9.3 Using shared_preferences for lightweight key-value storage 9.4 Best practices for data handling and caching	

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Week 15	**Project Showcase**	**Submission & Presentation:** ● **Project Sprint 4** ● **Product Video** ● **Digital Poster**

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Team working skills
Collaborative development skills

Student learning time (SLT) details:

Distribution of student Learning Time (SLT) Course content outline					Teaching and Learning Activities			TOTAL SLT
	Guided Learning (Face to Face)				Guided Learning Non-Face to Face	Independent Learning Non-Face to Face		
CLO	L	T	P	O				
CLO 1	10h		6h	4h		26h		**46h**
CLO 2	12h		12h	4h		33h		**61h**
CLO 3				4h	1h	5h		**10h**
Total SLT	**22h**		**18h**	**12h**	**1h**	**63h**		**117h**

	Continuous Assessment		PLO	Percentage	Total SLT
1	Group Project: i.　Lean Biz Canvas		KW	5	As in CLO1 (6h)
	ii.　Project Pitching		KW	5	As in CLO1 (6h)
	iii.　Project Backlog		KW	5	As in CLO1 (6h)
	iv.　Sprints (4)		PS	40	As in CLO2 (33h)
	v.　Project Showcase		KW	10	As in CLO1 (12h)
2	Teamworking: Note of Discussion (5)		TW	5	As in CLO3 (9h)
	Final Assessment			Percentage	Total SLT
3	Final Exam		PS	30	3h
	Grand Total			**100**	**120h**

Special requirement to deliver the course:

Development Software: Android SDK / iOS SDK, Flutter SDK, Microsoft VS Code
Collaboration Software: Live Share, Webex / Google Meet, Git

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Emulator: Android Emulator / iOS simulator

Learning resources:

References for Flutter Framework:
1. Flutter Documentation. https://docs.flutter.dev
2. Learn Dart Programming.   hhttps://dart.dev/language
   Dart Documentation. https://dart.dev/guides
3. List of books about Flutter. https://flutter.dev/docs/resources/books
4. Material Design https://m3.material.io

Academic honesty and plagiarism: *(Below is just a sample)*

Copying of work (texts, programs, etc.) from other students/groups or from other sources is strictly prohibited. Be warned: students who submit copied work will obtain a mark of **zero** for the assignment and exams and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

Other additional information (Course policy, any specific instruction etc.):

1. *Attendance is compulsory and will be taken in every lecture session. Student with less than 80% of total attendance is not allowed to sit for final exam.*
2. *Students are required to behave and follow the University's dressing regulation and etiquette all the time.*
3. *Exercises and tutorial will be given in class and some may be taken for assessment. Students who do not do the exercise will lose the coursework marks for the exercise.*
4. *Assignments must be submitted on the due dates. Some points will be deducted for late submissions. Assignments submitted three days after the due date will not be accepted.*
5. *Make up exam will not be given, except to students who are sick and submit medical certificate confirmed by UTM panel doctors. Make up exam can only be given within one week of the initial date of exam.*

No	Assessment	KW	PS	TW	TOTAL
		CLO1	CLO2	CLO3	
1	Group Project	25	40		65
2	Teamworking			5	5
3	Final Exam		30		30
TOTAL PLO	25	70	5	100	

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