SAN DIEGO GLOBAL KNOWLEDGE UNIVERSITY

Mobile Development Immersive 2

Course Name	Upon completion of this program, the student will be able to:	PLO1: Apply fundamental and intermediate programming principles to develop and optimize applications using Kotlin, Android Studio, and version control techniques.	PLO2: Implement user-friendly and efficient mobile application interfaces using Jetpack Compose.	PLO3: Apply programming languages and tools for Android to create mobile applications.	PLO4: Demonstrate the use of testing and debugging in mobile applications to ensure functionality and performance.	PLO5: Implement mobile applications on app stores while managing updates effectively.
MDI2 101: INTRODUCTION TO ANDROID DEVELOPMENT						
Describe the Android ecosystem and its components, including Android devices, Google Play Store, and the role of the Android operating system in mobile development.	X = See key below	P, RQ,WE, and FE		P, WE, and FE		
	IRM	I		I		
Demonstrate key features of Android Studio, demonstrating the ability to use the design editor for basic user interface design.	X = See key below	P, RA, WE and FE	P, WE, and FE	P, WE, and FE		
	IRM	I	I	I		
MDI2 102: PROGRAMMING FUNDAMENTALS - INTRODUCTORY						
Apply programming fundamentals by writing programs that demonstrate the correct use of variables, data types, and control structures in the Kotlin language.	X = See key below	P, RA, WE and FE	P, WE, and FE	P, WE, and FE		
	IRM	I	I	I		
Use object-oriented principles by applying basic concepts like class creation and object instantiation to develop small programs.	X = See key below	P, WE, and FE		P, WE, and FE		
	IRM	I		I		
Explain the fundamental concept of declarative programming techniques and explain how they differ from imperative approaches in practical applications.	X = See key below	P, RQ,WE, and FE		P, WE, and FE		
	IRM	I		I		
MDI2 103: PROGRAMMING FUNDAMENTALS - INTERMEDIATE						
Use data structures such as arrays and dictionaries to store, organize, and manipulate data in a program.	X = See key below	P, RA, WE and FE	P, WE, and FE	P, WE, and FE		
	IRM	R	R	R		
Explain object-oriented principles, including inheritance, polymorphism, and encapsulation, to build reusable and modular code.	X = See key below	P, RQ,WE, and FE		P, WE, and FE		
	IRM	R		R		
Identify declarative programming concepts to create more concise and readable code, contrasting it with imperative programming techniques.	X = See key below	P, RA,WE, and FE		P, WE, and FE		
	IRM	R		R		
MDI2 104: PRINCIPLES OF UX/UI FOR ANDROID						
Apply Google's Material Design principles to create functional and visually appealing user interfaces for Android applications.	X = See key below	P, RA, WE and FE	P, RA, WE and FE	P, WE, and FE		
	IRM	I	I	I		
Demonstrate appropriate design of effective layout, navigation, and content organization.	X = See key below	P, RA,WE, and FE	P, WE, and FE	P, RA,WE, and FE		
	IRM	I	I	I		
Implement interactive prototypes using any industry-standard tool, simulating user interactions and flows for Android apps.	X = See key below	P, RQ,WE, and FE	P, RQ,WE, and FE	P, WE, and FE		
	IRM	I	I	I		
MDI2 105: IMPLEMENTATION OF UX/UI FOR ANDROID						
Apply UI/UX principles to create user interfaces for Android apps based on wireframes and mockups, adhering to Google's Material Design principles.	X = See key below	P, RQ,WE, and FE	P, WE, and FE	P, WE, and FE		
	IRM	I	I	I		
Apply interactive prototype designs into fully functional, responsive Android app interfaces using Android Studio and XML.	X = See key below	P, WE, and FE	P, RQ,WE, and FE	P, WE, and FE		
	IRM	I	I	I		
MDI2 106: IMPLEMENTATION OF ADVANCED UI/UX FOR ANDROID						
Apply advanced, dynamic UI components that adapt to various device types and screen sizes using Android's constraint and motion layouts.	X = See key below	P, RA,WE, and FE	P, RA, WE and FE	P, WE, and FE		
	IRM	R	R	R		
Identify complex animations and transitions that enhance the user experience while maintaining app performance.	X = See key below		P, RQ,WE, and FE	P, WE, and FE	P, WE, and FE	
	IRM		R	R	I	
Apply custom design requirements and apply standard UI principles to build unique, non-standard Android components.	X = See key below	P, RQ,WE, and FE	P, RA, WE and FE	P, WE, and FE		
	IRM	R	R	R		
MDI2 107: TESTING AND DEBUGGING FOR ANDROID						
Implement unit, integration, and UI tests using Android's testing frameworks to ensure app functionality and performance.	X = See key below		P, RA, WE, and FE	P, WE, and FE	P, RA, WE, and FE	
	IRM		I	I	I	

Use automated UI testing tools like Espresso to simulate user interactions and validate app behavior.	X = See key below		P, WE, and FE	P, WE, and FE	P, WE, and FE	
	IRM		I	I	I	
Identify performance bottlenecks and apply optimization techniques to improve app performance and stability.	X = See key below		P, RQ, WE and FE	P, WE, and FE	RQ, P, WE, and FE	
	IRM		I	I	I	
MDI2 108: DATA PERSISTENCE FOR ANDROID						
Implement data storage solutions using Android's built-in mechanisms, including SharedPreferences, SQLite, and the Room Persistence Library.	X = See key below	P, WE, and FE		P, WE, and FE	P, RA, WE and FE	
	IRM	I		I	I	
Use cloud-based storage solutions to synchronize and store app data across multiple devices.	X = See key below	P, WE, and FE		P, WE, and FE	P, WE and FE	
	IRM	I		I	I	
Examine data synchronization challenges between offline and online states, ensuring data consistency.	X = See key below	P, RQ, WE, and FE		P, RQ, WE and FE	P, WE and FE	
	IRM	I		I	I	
MDI2 109: NETWORKING AND WEB SERVICES FOR ANDROID						
Implement network requests and data exchange using libraries like Retrofit, OkHttp, or Volley within Android applications.	X = See key below	P, RQ, WE, and FE		P, RQ, WE, and FE	P, RQ, WE, and FE	
	IRM	I		I	I	
Apply RESTful API principles to interact with web services, including fetching, sending, and updating data.	X = See key below	P, RQ, WE, and FE		P, RQ, WE, and FE	P, RQ, WE, and FE	
	IRM	I		I	I	
Use asynchronous programming techniques, such as Kotlin Coroutines and AsyncTask, to manage network operations efficiently.	X = See key below	P, RA, WE, and FE		P,WE, and FE	P,WE, and FE	
	IRM	I		I	I	
MDI2 110: MOBILE APPLICATION DEVICE SENSORS - INTRODUCTORY						
Apply techniques for collecting and processing real-time sensor data in Android applications.	X = See key below	P, RA, WE, and FE		P,WE, and FE	P, RQ, WE, and FE	
	IRM	I		I	I	
Use GPS and location-based services to create location-aware features.	X = See key below	P, RA, WE, and FE		P,WE, and FE	P, RQ, WE, and FE	
	IRM	I		I	I	
MDI2 111: MOBILE APPLICATION DEVICE SENSORS - INTERMEDIATE						
Use multi-sensor functionality in Android applications, integrating data from accelerometers, gyroscopes, magnetometers, and environmental sensors.	X = See key below	P, RQ, WE, and FE		P, WE, and FE	P, WE, and FE	
	IRM	R		R	R	
Apply sensor fusion techniques to combine multiple sensor data for enriched application functionality.	X = See key below	P, WE, and FE		P, WE, and FE	P, RQ, WE, and FE	
	IRM	R		R	R	
Use real-time data visualization techniques to dynamically display sensor data within Android applications.	X = See key below	P, WE, and FE	P, WE, and FE	P, WE, and FE		
	IRM	R	R	R		
MDI2 112: MOBILE APPLICATIONS FOR WEARABLES - INTRODUCTORY						
Apply wearable-specific user interfaces optimized for smaller screens and unique interaction patterns.	X = See key below	P. RA, WE, and FE	P, RA, WE, and FE	P, WE, and FE		
	IRM	I	I	I		
Use Android Wear OS features to develop applications for smartwatches and other wearable devices.	X = See key below	P, RQ, WE and FE		P, WE, and FE		P, RQ, WE, and FE
	IRM	I		I		I
Recognize wearable sensors to track health and fitness data, integrating it into wearable applications.	X = See key below	P, WE, and FE		P, WE, and FE	P, RQ, WE, and FE	
	IRM	I		I	I	
MDI2 113: MOBILE APPLICATIONS FOR WEARABLES - INTERMEDIATE						
Apply advanced wearable applications that support multi-device synchronization and real-time data sharing.	X = See key below	P, RQ, WE and FE		P, WE, and FE	P, RQ, WE and FE	P, WE, and FE
	IRM	R		R	R	R
Use custom sensors and advanced health tracking features within Android wearable applications.	X = See key below	P, RA, WE, and FE		P, WE, and FE	P, WE, and FE	
	IRM	R		R	R	
Apply wearable app functionality by utilizing third-party APIs and services.	X = See key below	P, WE, and FE		P, WE, and FE	P, WE, and FE	
	IRM	R		R	R	
MDI2 114: ANDROID TABLET DEVELOPMENT						
Apply techniques to create multi-pane user interfaces that enhance the user experience on Android tablets.	X = See key below	P, RQ, WE and FE		P, WE, and FE	P, RA, WE, and FE	
	IRM	I		I	I	
Use Android tablet-specific features such as drag-and-drop and multi-window mode to improve app functionality.	X = See key below	P, RQ, WE and FE		P, WE, and FE	P, WE, and FE	
	IRM	I		I	I	
MDI2 115: LOCALIZATION IN ANDROID APPLICATION						

Apply localization features in Android applications to support multiple languages and regions.	X = See key below	P, WE, and FE		P, WE, and FE	P, WE, and FE	P, WE, and FE
	IRM	I		I	I	I
Apply best practices for translating app content, including text, dates, numbers, and currencies, for different locales.	X = See key below	P, RQ, WE, and FE		P, WE, and FE	P, RQ, WE, and FE	P, WE, and FE
	IRM	I		I	I	I
Use Android frameworks to manage right-to-left (RTL) layouts and other region-specific UI elements.	X = See key below		P, RA, WE, and FE	P, WE, and FE	P, WE, and FE	
	IRM		I	I	I	
MDI2 116: DEPLOYMENT AND GOOGLE STORE SUBMISSION						
Apply the process of preparing Android apps for release, including signing APKs and generating app bundles.	X = See key below	P, WE, RQ, WE, and FE		P, WE, and FE	P, RQ, WE, and FE	P, RQ, WE, and FE
	IRM	R		R	R	I
Use Google Play Store guidelines and policies to ensure compliance during the app submission process.	X = See key below	P, WE, RA, and FE		P, WE, and FE	P, WE, and FE	P, RQ, WE, and FE
	IRM	R		R	R	I
MDI2 117: ANDROID AUTOMATED TESTING						
Apply automated unit, integration, and UI tests using Android testing frameworks such as JUnit and Espresso.	X = See key below	P, RQ, WE and FE		P, WE, and FE	P, RQ, WE and FE	
	IRM	R		R	R	
Apply test-driven development (TDD) techniques to improve app functionality and maintainability.	X = See key below		P, RA, WE, and FE	P, WE, and FE	P, RA, WE and FE	
	IRM		R	R	R	
Use continuous integration (CI) tools to automate the testing process and ensure consistent code quality.	X = See key below	P, RA, WE, and FE		P, WE, and FE	P, WE and FE	
	IRM	R		R	R	
MDI2 118: CAPSTONE – PLANNING AND DESIGN						
Identify the objectives and scope of the capstone project.	X = See key below	P, RA, WE, and FE		P, WE, and FE		P, WE, and FE
	IRM	R		R		R
Analyze the target audience and user needs for the application.	X = See key below		P, RQ, WE and FE	P, WE, and FE		P, WE, and FE
	IRM		R	R		R
Create wireframes and prototypes, explaining the functional and technical requirements of the proposed application.	X = See key below	P, RQ, WE, and FE	P, RQ, WE and FE	P, WE, and FE	P, WE and FE	
	IRM	R	R	R	R	
MDI2 119: CAPSTONE – DEVELOPMENT PHASE 1						
Use Kotlin programming concepts to develop core application features.	X = See key below	P, RA, WE, and FE	P, WE, and FE	P, WE, and FE	P, RQ, WE and FE	
	IRM	R	R	R	R	
Integrate user interface designs into the application using Jetpack Compose.	X = See key below		P, RQ, WE and FE	P, WE, and FE		
	IRM		R	R		
Implement data persistence methods suitable for the application.	X = See key below	P, RA, WE, and FE		P, WE, and FE	P, RQ, WE and FE	P, WE, and FE
	IRM	R		R	R	R
MDI2 120: CAPSTONE – DEVELOPMENT PHASE 2						
Use advanced Kotlin programming techniques to enhance application features.	X = See key below	P, RA, RQ, WE and FE	P, RQ, WE and FE	P, WE, and FE	P, RQ, WE and FE	P, WE, and FE
	IRM	M	M	M	M	M
Apply methods for optimizing the application's performance and efficiency.	X = See key below	P, RA, WE, and FE	P, RQ, WE and FE	P, WE, and FE	P, WE and FE	P, RQ, WE, and FE
	IRM	M	M	M	M	M
Resolve bugs through comprehensive testing and debugging.	X = See key below	P, RA,WE, and FE	P, WE, and FE	P, WE, and FE	P, RA, RQ, WE and FE	P, WE, and FE
	IRM	M	M	M	M	M

X = The assessment which measures the stated program objective/outcome.

KEY	
Projects	P
Researched and Critiqued Articles	RA
Review / Discussion Question Responses	RQ
Case Studies	CS
Web Exercises	WE

Final Exam with Essay Questions	FE
Introduced, Reinforced, Mastered	IRM