

Subject Description Form

Subject Code	EIE3109
Subject Title	Mobile Systems and Application Development
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	ENG2002 Computer Programming
Objectives	This course aims at providing students with an understanding of the real-time embedded and mobile systems, and the techniques essential to the design and implementation of mobile applications.
Intended Subject Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p><u>Category A: Professional/academic knowledge and skills</u></p> <ol style="list-style-type: none"> 1. Understand the structure of real-time operating systems for modern mobile computer systems. 2. Understand the programming techniques and tools for developing software that is run in modern mobile computer systems 3. Apply the knowledge to develop practical applications for modern real-time mobile computer systems. <p><u>Category B: Attributes for all-roundedness</u></p> <ol style="list-style-type: none"> 4. understand the creative process when designing solutions to a problem
Subject Synopsis/ Indicative Syllabus	<ol style="list-style-type: none"> 1. <u>Introduction</u> Introduction to Embedded Systems – embedded real-time systems, embedded programming and program models, real-time operating system (RTOS). Introduction to Mobile Systems and Mobile Application Development – advancement of mobile devices, comparison of various mobile platforms (iOS, Android, Windows Phone, Blackberry, etc.), application design process. 2. <u>iOS Application Development</u> Introduction to iOS – system architecture, development environment (Xcode), MVC architecture. Introduction to Swift Programming – basic syntax, optional type, dictionary, closure, property observer, computed properties. 3. <u>Android Application Development</u> Introduction to Android OS – development environment (Android Studio), Android application basic (activity, service, content provider, broadcast receiver, intent resolution). User Interface – layout overview, user interface widget, user interface event handling, user notification. Data Storage – shared preference, internal storage, external storage, SQLite, content provider. Networking – Android network overview and management, socket and HTTP, Wi-Fi and Bluetooth, GPS & telephony. Multimedia – voice recording, image capturing, basic drawing & animation.
Teaching/Learning Methodology	Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities.

	<p>Tutorials: During tutorials, students will work on/discuss some chosen topics in small group. This will help strengthen the knowledge taught in lectures.</p> <p>Laboratory and assignments: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems. The assignments will help students to review the knowledge taught in class.</p> <p>While lectures and tutorials will help to achieve the professional outcomes, the open-ended questions in laboratory exercises and assignments will provide the chance to students to exercise their creativity in problem solving.</p>																																																			
<p>Assessment Methods in Alignment with Intended Subject Learning Outcomes</p>	<table border="1" data-bbox="475 488 1401 1084"> <thead> <tr> <th data-bbox="475 488 783 645" rowspan="2">Specific Assessment Methods/Tasks</th> <th data-bbox="783 488 967 645" rowspan="2">% Weighting</th> <th colspan="4" data-bbox="967 488 1401 595">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="967 595 1074 645">1</th> <th data-bbox="1074 595 1182 645">2</th> <th data-bbox="1182 595 1291 645">3</th> <th data-bbox="1291 595 1401 645">4</th> </tr> </thead> <tbody> <tr> <td data-bbox="475 645 783 752">1. Continuous Assessment (total: 50%)</td> <td data-bbox="783 645 967 752"></td> <td data-bbox="967 645 1074 752"></td> <td data-bbox="1074 645 1182 752"></td> <td data-bbox="1182 645 1291 752"></td> <td data-bbox="1291 645 1401 752"></td> </tr> <tr> <td data-bbox="475 752 783 831">• Homework and assignments</td> <td data-bbox="783 752 967 831">15%</td> <td data-bbox="967 752 1074 831">✓</td> <td data-bbox="1074 752 1182 831">✓</td> <td data-bbox="1182 752 1291 831">✓</td> <td data-bbox="1291 752 1401 831">✓</td> </tr> <tr> <td data-bbox="475 831 783 882">• Tests</td> <td data-bbox="783 831 967 882">15%</td> <td data-bbox="967 831 1074 882">✓</td> <td data-bbox="1074 831 1182 882">✓</td> <td data-bbox="1182 831 1291 882">✓</td> <td data-bbox="1291 831 1401 882"></td> </tr> <tr> <td data-bbox="475 882 783 963">• Laboratory exercises</td> <td data-bbox="783 882 967 963">20%</td> <td data-bbox="967 882 1074 963"></td> <td data-bbox="1074 882 1182 963"></td> <td data-bbox="1182 882 1291 963">✓</td> <td data-bbox="1291 882 1401 963">✓</td> </tr> <tr> <td data-bbox="475 963 783 1014">2. Examination</td> <td data-bbox="783 963 967 1014">50%</td> <td data-bbox="967 963 1074 1014">✓</td> <td data-bbox="1074 963 1182 1014">✓</td> <td data-bbox="1182 963 1291 1014">✓</td> <td data-bbox="1291 963 1401 1014">✓</td> </tr> <tr> <td data-bbox="475 1014 783 1084">Total</td> <td data-bbox="783 1014 967 1084">100%</td> <td colspan="4" data-bbox="967 1014 1401 1084"></td></tr> </tbody> </table> <p data-bbox="475 1115 1401 1178">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p data-bbox="475 1209 1401 1301">Assignment, homework and laboratory exercises will require students to apply what they have learnt to solve problems. There will be open-ended questions that allow students to exercise their creativity in making design.</p> <p data-bbox="475 1332 1401 1395">Examination and tests: They assess students' achievement of the learning outcomes more rigorously.</p>						Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				1	2	3	4	1. Continuous Assessment (total: 50%)						• Homework and assignments	15%	✓	✓	✓	✓	• Tests	15%	✓	✓	✓		• Laboratory exercises	20%			✓	✓	2. Examination	50%	✓	✓	✓	✓	Total	100%				
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Total	100%																																																			
<p>Student Study Effort Expected</p>	<p>Class contact (time-tabled):</p>																																																			
	<ul style="list-style-type: none"> • Lecture 					24 Hours																																														
	<ul style="list-style-type: none"> • Tutorial/Laboratory/Practice Classes 					15 hours																																														
	<p>Other student study effort:</p>																																																			
	<ul style="list-style-type: none"> • Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination 					36 Hours																																														
	<ul style="list-style-type: none"> • Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing 					30 Hours																																														
	<p>Total student study effort:</p>					105 Hours																																														

Reading List and References	Reference Books: <ol style="list-style-type: none"> 1. Raj Kamai, Embedded Systems: Architecture, Programming and Design, 3rd ed., McGraw-Hill, 2015. 2. Sahar, Ahmad ; Clayton, Craig, IOS 13 Programming for Beginners: Get Started with Building IOS Apps with Swift 5 and Xcode 11, 4th Edition, Birmingham: Packt Publishing, Limited 2020. 3. Wei-Meng Lee, Beginning Swift programming, John Wiley & Sons 2015. 4. J. F. DiMarzio, Beginning Android programming with Android studio, Fourth edition, Wrox, a Wiley brand 2017. 5. Ted Hagos, Learn Android Studio 3 with Kotlin: Efficient Android App Development, Apress 2018 6. Dmitry Jemerov Svetlana Isakova, Kotlin in action, Manning Publications Co. 2017
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Prepared by	Mr Ivan Lau