CM3050 Mobile Development

Module Description

Mobile technology, including smartphones and tablets, has been a significant technology platform in recent times and the mobile app ecosystem is a significant driver of both innovation and employment. Mobile development is, therefore, a critical applied area of computer science. This module will support you in getting started in mobile development, and it builds on material such as databases, networking and web development taught elsewhere in the programme.

This module is designed to give you an overview of the mobile development ecosystem as well as how to design, develop and test create cross-platform mobile apps built using React Native.

Learners get to achieve the above through a heavily practical approach, using a mixture of weekly programming exercises, code demonstrations, videos and quizzes.

Module Goals and Objectives

Upon successful completion of this course, you will be able to:

1. Design an apps user interface based on a set of requirements and goals,
2. Critically discuss UX techniques used by prominent applications,
3. Design wireframes to inform the testing and development process,
4. Replicate different design styles across devices,
5. Create accessible applications,
6. Create responsive applications that adapt to device requirements,
7. Design and create UI elements, linking them to actions,
8. Utilise navigation systems across devices,
9. Assess the use and performance of more advanced UI elements such as scroll views and table views,
10. Create precise and useful unit tests to help monitor the performance of an application,
11. Integrate API’s within your application. Making authenticated requests,
12. Access and use sensors found on mobile devices, e.g. camera, accelerometer,
13. Create app bundles that can be submitted to the relevant app stores.

Textbook and Readings

Specific essential readings are available for each week and are included on the Coursera page.

Module Outline

The module consists of ten topics divided into 20 weeks that focus on key concepts of mobile development.

Topic 1: The mobile app ecosystem	**Key concepts:** In this topic you will learn about the mobile app ecosystem. **Learning outcomes:** • Understand the limitations and advantages of different platforms • Discuss the elements of apps you enjoy • Understand the course structure
Topic 2: Mobile User Interface design	**Key concepts:** In this topic you will learn about the mobile user interface design. **Learning outcomes:** • Understand the need for wireframing • Discuss the link between psychology and design decisions • Understand and identify different design styles and replicate them using code
Topic 3: Programming user interfaces	**Key concepts:** In this topic you will learn about programming user interfaces. **Learning outcomes:** • Use JSX to create basic elements on the screen • Understand the need for pagination • Understand and be able to use UI elements in React Native

Topic 4: Advanced user interface elements	**Key concepts:** In this topic you will learn about advanced user interface elements. **Learning outcomes**: • To develop a stronger understanding of advanced techniques • Use advanced methods of interaction • Understand and program animations
Topic 5: Developing a mobile app project	**Key concepts:** In this topic you will learn about the development of a mobile app project. **Learning outcomes:** • Learn advanced JavaScript techniques • Understand and implement testing • To discuss what makes efficient programming
Topic 6: Data sources	**Key concepts:** In this topic you will learn about data sources. **Learning outcomes:** • To handle and manipulate data • To understand the importance of data ethics • To understand what data sources include • To start work on the final project • To give feedback on others' ideas • To develop an idea for the final project
Topic 7: Integrating cloud services	**Key concepts:** In this topic you will learn about the integration of cloud services. **Learning outcomes:** • To download information from the cloud • To detect and deal with unstable internet connections • To understand what constitutes cloud computing

Topic 8: Sensor programming	**Key concepts:** In this topic you will learn about sensor programming. **Learning outcomes:** • How to best use a sensor • How to communicate with a sensor • Understand what a sensor is
Topic 9: Introduction to APIs	**Key concepts:** In this topic you will learn about the basis of APIs. **Learning outcomes:** • To discuss APIs • Understand how to implement APIs in applications • Continue learning about APIs and their uses
Topic 10: Deployment	**Key concepts:** In this topic you will learn about the requirements to deploy a mobile application. **Learning outcomes:** • To understand the distribution process • To understand what codes signing entails • To learn what is required to deploy an app from expo

Activities of This Module

The course is comprised of the following elements:

- **Lecture videos:** In each week the concepts you need to know will be presented through a collection of short video lectures. You may stream these videos for playback within the browser by clicking on their titles or download the videos.

- **Practice Quizzes:** Topics include practice quizzes, intended for you to assess your understanding of the content. You will be allowed unlimited attempts at each practice quiz. There is no time limit on how long you take to complete each

attempt at the quiz. These quizzes do not contribute toward your final score in the class.

- **Practice Programming exercises (hack-it tasks):** Every week you will apply what you learned by completing short, engaging programming exercises. These assignments do not contribute toward your final score in the class.

- **Graded Assignments:** There are two graded assignments, CW1 is worth 30% of the final module grade and CW2 is worth 70% of the final module grade. Each assignment comprises multiple parts which learners work on during earlier weeks. All assignments will be graded by the project tutors.

- **Discussion Prompts:** Topics also include discussion prompts. You will see the discussion prompt alongside other items in the lesson. Each prompt provides a space for you to respond. After responding, you can see and comment on your peers' responses. All prompts and responses are also accessible from the general discussion forum and the topic discussion forum.

- **Readings:** Topics may include several suggested readings. They are good supplementary materials for you to further understand the module topics.

How to Pass This Module

The module will contain a range of summative and formative assessments. Summative assessments are assessments which contribute directly towards your final grade. Formative assessments do not count directly towards your final grade. Instead, they provide you with opportunities for low stakes practice and will often provide some sort of feedback about your progress. For example, a practice quiz might provide you with feedback about why a particular answer was wrong.

The course has two major assessments. One worth 30% of your grade and one worth 70% of your grade:

- Coursework 1: this assignment comprises a portfolio of assignments completed in the weeks prior (approximate deadline in week 13).

- Coursework 2: This assignment is a more substantial programming project and supplementary material, which is extensively detailed in week 10 (approximate deadline in week 22).

This is a detailed breakdown of all the marks:

Activity	**Required? (Summative)**	**Deadline week**	**Estimated time per course**	**% of final grade**
Written, staff graded coursework 1	Yes	Approximately week 13	25 hours	30%
Written, staff graded coursework 2	Yes	Approximately week 22	25 hours	70%