

Open University of Mauritius

Postgraduate Diploma in Web and Mobile Applications Development [OUpd001]

1. Aim

This **Postgraduate Diploma in Web and Mobile Applications Development** provides learners with the specialized knowledge that is important in the development of web and mobile computer applications. Learners will study and gain experience with the languages and frameworks that are most commonly used in developing these applications, with the design of user interfaces and software systems, and with associated topics such as networking, hosting infrastructure, and security.

They will also learn the fundamental principles on which these topics are based, so that they are better prepared for the new technologies that are constantly being developed. This is a **Post-graduate Diploma**.

2. Programme requirements

A Bachelor's degree with at least second class from a recognised university or alternative qualifications, including professional qualifications, acceptable to the Open University of Mauritius. Candidates must have a good mastery of English Language. Prior Learning and Prior Experiential Learning may be considered by the university for admission to this programme. Applicants may be asked to pass an entry test. Individuals with an equivalent knowledge of the background materials through work or self-study may be accepted into this program.

3. Programme Duration

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| | Minimum | Maximum |
| Postgraduate Diploma | 1 year | 3 years |

4. Minimum credits required for the awards

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| Postgraduate Diploma | 30 Credits (without dissertation) |
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5. Assessment

Each module carries 100 marks and will be assessed as follows (unless otherwise specified):

Assessments will be based on a 2-hour written examination per module and project submissions for each module. Written examination will carry a maximum of 20% of total marks. Continuous assessment will be based on projects submitted per module and will carry a maximum of 30% on all projects submitted for each module. A compulsory

comprehensive and final project covering either the Android or the iOS areas of study will be submitted and will carry a maximum of 50% of total marks. To pass any module the learner should score a minimum of 40.0% in the end of semester written examinations and 40% in the continuous assessment based on projects submitted per module. To be awarded the diploma, learner should pass in the final project by scoring a minimum of 60% in the final project. Learners may re-sit up to a maximum of two failed modules for the semester of the programme.

6. Grading

| Percentage Range | Description | Grade | Grade Point |
|----------------------|--------------|-------|-------------|
| 70.0% and above | Excellent | A | 5 |
| $60\% \leq x < 70\%$ | Very Good | B | 4 |
| $50\% \leq x < 60\%$ | Good | C | 3 |
| $45\% \leq x < 50\%$ | Satisfactory | D | 2 |
| $40\% \leq x < 45\%$ | Pass | E | 1 |
| $0\% \leq x < 40\%$ | ungraded | U | 0 |

7. Award

Post-graduate Diploma in Web and Mobile Applications Development

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| Distinction | : CPA \geq 70 |
| Merit | : $60 \leq$ CPA < 70 |
| Pass | : $40 \leq$ CPA < 60 |

If CPA < 40, the student will have to repeat the entire academic year, and retake the modules as and when offered. However, s/he will not be required, if s/he wishes, to retake module(s) for which Grade C or above has been obtained. Students are allowed to repeat twice once over the entire duration of the Programme of Studies. No award is made if CPA < 40.

8. Course structure

TOTAL CREDITS = 30

| MODULE CODE | MODULE | Semester 1 | Semester 2 | Number of Credits |
|-------------|--|------------|------------|-------------------|
| OUpd001111 | Web Applications Development | √ | | 4 |
| OUpd001112 | Programming and Scripting Languages for Web Applications | √ | | 4 |
| OUpd001113 | iPhone and iPad Applications Development Using Objective C | √ | | 4 |
| OUpd001121 | Human Computer Interfaces | | √ | 4 |
| OUpd001122 | Android Mobile Applications Development | | √ | 4 |
| OUpd001123 | Mobile Applications Development for iPhone and iPad | | √ | 4 |

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|------------|--|--|---|---|
| OUpd001124 | Final Project on Web and Mobile Applications Development | | √ | 6 |
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9. Modules Outline

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| OU : Web Applications Development [OUpd001111] |
| Aim |
| In this Web Applications Development module, trainees will learn the fundamentals of XHTML, CSS, Javascript, client-side and server-side scripting, PHP and CGI programming with Perl. Learners will also enhance their skills in application integration with SQL and MySQL database systems. Learners will also learn advanced XHTML, CSS, Javascript, and AJAX. Server side topics include developing applications using Java Web Services (servlets and JSP), integration with SQL and MySQL database systems, and common frameworks for rapid development and deployment. A major emphasis is on high-performance platforms and application architectures suitable for large and complex projects. |

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| Contents |
| Unit 1: Introduction to Web Programming Unit 2: HTML and XHTML Technologies Unit 3: Cascade Style Sheets Unit 4: XML Technologies Unit 5: Scripting v/s Programming Languages Unit 6: Java Programming Unit 7: Java Servlets |
| Learning Outcomes After successful completion of this module, learners should be able to Develop HTML and XHTML pages Develop Cascading Stylesheets CSS Understand the difference between Scripting and Programming Languages Understand the Servlet Model Design and develop Thread-Safe Servlets Design and develop Servlets Using Session Management Design and develop Servlets to handle Server-Side Exceptions Understand the Java Server Pages (JSP) Technology Model Develop a web site consisting of HTML and XML features Understand the plugin architecture for web application development |

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| OU : Programming and Scripting Languages for Web Applications [OUpd001112] |
| Aim |
| In this module, students will learn the fundamentals of Programming and Scripting Languages and understand the importance of each of these types of languages in web development. Learners will also enhance their skills in using the appropriate programming and scripting languages depending on the web development and deployment environment being adopted such as devices to be used for publishing and databases that will be involved to maintain data online. Students will therefore gain a good understanding of a range of mostly used |

programming languages and obtain a critical understanding of the outstanding features of each of these languages. In doing so, it provides advanced programming language skills, exercised through a series of coursework. In particular, this course conveys the idea of scripting languages acting as glueware between components of existing software systems in order to build large systems.

Contents

Unit 1: Fundamentals of Software Engineering & Programming
 Unit 2: Introduction to Object Oriented Programming (OOP)
 Unit 3: Working with Scripts using the Script Editor
 Unit 4: Working with Control Structures Logic
 Unit 5: Coding and Debugging of Scripts
 Unit 6: Working with Menus
 Unit 7: Interacting with Multimedia elements
 Unit 8: Principles of Instructional and Interface Design
 Unit 9: Server-side Scripting
 Unit 10: Introduction to Web Services
 Unit 11: Introduction to Socket Communications
 Unit 12: Arrays in Scripting
 Unit 13: Database Access

Learning Outcomes

After successful completion of this module, learners should be able to

Understand the fundamentals of Software Engineering and Programming and the importance of the following principles:

Appreciate the role of different programming possibilities prior to the development and management of systems:

Object-oriented: good at structuring large code

Imperative: good at performance

Functional: good at abstraction

Logic: good at reasoning

Be autonomous in problem analysis/solution:

Really understand the problem to pick the right paradigm/approach for producing a solution

Understanding of core characteristics of contemporary operating systems: make good use of available resources

Appreciate the role of language as glue wear in configuring/maintaining systems:

Scripting languages combine existing code

Knowledge of key abstractions across programming languages:

Write reusable and maintainable code

Acquire technical proficiency related to advanced techniques that may be required in different web programming spheres

OU : iPhone & iPad Applications Development Using Objective C [OUpd001113]

Aim

Students will understand the Objective-C language concepts and they will learn how to build cost effective applications for iPhones and iPads using the Objective C development tool. This Objective-C module is at the core of web apps programming and teaches the fundamentals of programming in Objective-C, the language used to develop iPhone and iPad applications. This course covers Xcode, the integrated development environment used to build Objective-C applications. Primitive and reference variables are covered as well as arithmetic operators, conditional processing, looping, and functions.

Contents

Unit 1: Objective-C Overview

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| Unit 2: Variables Unit 3: Arithmetic Unit 4: Conditional Logic and Looping Unit 5: Functions Unit 6: Object-oriented Programming According to Objective-C Unit 7: Inheritance Unit 8: Polymorphism Unit 9: Arrays Unit 10: Foundation Framework Unit 11: Collections Unit 12: Memory Considerations Unit 13: Cocoa Framework |
| Learning Outcomes After successful completion of this module, learners should be able to: <ul style="list-style-type: none"> • <i>Learn how to use Xcode to develop Objective-C programs.</i> • <i>Learn how to define primitive and reference variables.</i> • <i>Understand the use of arithmetic operators.</i> • <i>Know how to write conditional and looping statements.</i> • <i>Learn how to write and call a function.</i> • <i>Understand the object-oriented features of Objective-C.</i> • <i>Learn how to create objects and methods.</i> • <i>Understand important classes in the Foundation framework.</i> • <i>Learn how to build a basic user interface using the Cocoa framework</i> |

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| OU : Human Computer Interfaces [OUpd001121] |
| Aim |
| This module aims at introducing the skills and concepts of Human-Computer Interaction (HCI) that will enable the students to design systems that effectively meet human needs. It covers iterative design processes, interactive prototype construction, discount evaluation techniques, and the historical context of HCI. Learners will learn common interface idioms and the support available for their integration into aesthetically appealing and practical, efficient interactions between humans and machine, including editors, browsers, games, networking/social sites, posting boards, etc. |

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| Contents |
| Unit 1: Introduction to Human Computer Interaction Unit 2: Interface quality and evaluation Unit 3: Interactive system and interface design examples Unit 4: Dimensions of interface variability Unit 5: User-centered design and task analysis Unit 6: User interface implementation |

Learning Outcomes

After successful completion of this module, learners should be able to:

Understand the scope of issues affecting human-computer interaction

Understand the impact of good and bad user interfaces

Know the diversity of users and tasks (applications) and their impact on the design of user interfaces

Know the limits of knowledge of individuals developing HCI systems

Understand the need to work with others, skilled in diverse areas such as software engineering, human factors, technical communication, statistics, graphic design, etc.

Understand the cost/benefit trade-offs in HCI design

Know the different system development lifecycles including those particularly applicable to HCI systems (e.g., iterative design, implementation, evaluation, and prototyping)

Understand the need to evaluate system usability (e.g., someone will evaluate usability even if not the developer, and, in some cases, not evaluating constitutes professional misconduct)

Know the existence of design, implementation, and evaluation tools for developers

OU : Android Mobile Applications Development [OUpd001122]

Aim

In this course, learners will learn how to use jQuery Mobile, an HTML5-based user interface system, to develop single sites for all popular mobile devices such as smartphones and tablets using the Android platform. They will learn how to use jQuery Mobile to handle touch events, build mobile-optimized forms and widgets, incorporate HTML5 features, leverage phone capabilities such as making calls and texting, and more.

Contents

Unit 1: Introducing The Android Operating System

Unit 2: Android Development Environment

Unit 3: Developing Web Apps

Unit 4: User Interface Design and Menus

Unit 5: Views, Adapters, and Dialogs

Unit 6: Working with Text

Unit 7: Working with Lists and Tables

Unit 8: Graphics and Low-Level Events

Unit 9: Local Storage

Unit 10: Preferences

Unit 11: Getting Started with jQuery

Unit 12: Widgets and UI

Unit 13: Events

Unit 14: Integration with the Phone

Unit 15: PhoneGap

Unit 16: The Theme Framework

Unit 17: Plugins

Learning Outcomes

After successful completion of this module, learners should be able to:

Define the main characteristics and functionality of Android devices

Reproduce the installation of the Android Eclipse SKD

Define the Android user interface

Define Android user input, variables, and operations

Customize icons

Use decision-making controls

Define lists and arrays

Implement audio in Android apps

Develop Android apps

OU : Mobile Applications Development for iPhone and iPad [OUpd001123]**Aim**

In this application development training programme, students will learn how to develop iPhone and iPad applications using the Xcode Integrated Development Environment.

The course covers building views and students will learn how to develop program code, and testing the application on a device simulator. This course covers major user interfaces including tab bar views, table views, page-based views, and storyboards. Database applications are also explored in addition to MapKit, Web View, and camera applications.

Contents

Unit 1: iOS Overview

Unit 2: User Interfaces

Unit 3: iOS Applications

Unit 4: View Navigation

Unit 5: Page-based Applications

Unit 6: Picker Views

Unit 7: Database Applications

Unit 8: Database Applications Using SQLite

Unit 9: Using iCloud

Unit 10: Storyboarding

Unit 11: Web Views

Unit 12: Map Views

Unit 13: Camera Applications

Learning Outcomes

After successful completion of this module, learners should be able to:

To build iOS applications for iPhone, iPod Touch and iPad

To develop iOS apps. Xcode, Interface Builder, Instruments and the iPhone Simulator

Use techniques to build scalable apps using MVC (Model, View Controller)

Know the ins and outs of common iOS techniques like Delegates and Target/Action

Have a detailed understanding of how the iOS SDK works, removing the "magic" from iOS development

To deploy an app to a real device and the provisioning process

Know the details and insight into the app store submission process

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| OU : Final Project on Web and Mobile Applications Development [OUpd001124] |
| Aim |
| <p>Students will submit a comprehensive and final project based on a specific case study covering either the Android or iOS development areas. This module will serve as a final test to assess the learner’s capabilities in the following major areas:</p> <ul style="list-style-type: none"> • How to start planning the development of a Mobile Application? • How to structure the project? • How to get great maintainability for future extensions? • How to get clean code? • How to test Mobile Applications? • How to deploy mobile apps? |

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| Project Structure |
| <p>Unit 1: Case Study Analysis Unit 2: Gathering requirements Unit 3: Setting up the project Unit 4: Project Structure Unit 5: Getting useful libraries Unit 6: Designing: Building logos and mock-ups Unit 7: Coding and Development Unit 8: Testing &Implementation Unit 9: Release</p> |
| Learning Outcomes |
| <p>After successful completion of this module, learners should be able to:</p> <ul style="list-style-type: none"> • <i>To understand the process behind identifying requirements towards building Android and iOS applications</i> • <i>To properly structure the development of web apps projects for sustainable maintainability</i> • <i>To clearly understand the coding techniques used to build scalable apps for mobiles using both the Android and iOS development platforms</i> • <i>Have a detailed understanding of the testing methods for mobile apps</i> • <i>To deploy an app to a real device and the provisioning process</i> • <i>Know the details and insight into the app store submission process</i> |

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| Supporting Materials | |
| Manual | Open University of Mauritius OU : Final Project on Web and Mobile Applications Development |
| Video | |
| References | |