**ITW202: Mobile Application module Alignment with the Royal Kasho, Critical, Creative and Collaborative skills**

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| Module Code and Title ITW202 Mobile Application **Programme** BSc in Information Technology  **Credit Value** 12  **Module Tutor**  **Module Coordinator.**  **General Objective**  This module is intended to empower students to enter the world of mobile application development. Students will be exposed to various forms of mobile applications including cross-platform, Android, and iOS (Critical). The focus of the module will be on introducing students to the entire mobile application development process/cycle and finally to get students to develop mobile apps, test it and run it.(Creative)  **Learning Outcomes**  *On completion of the module, students will be able to:*   1. Define the unique roles of mobile applications. 2. State the design and hardware constraints of mobile applications in general and device platforms specifics. 3. Build a cross-platform mobile application using HTML5, CSS, JavaScript, and jQuery Mobile. (creative) 4. Generate native Android or iOS applications from a given cross-platform application.(creative) 5. Build an Android and/or iOS mobile application using current platform development tools. (Creative) 6. State the process of monetarizing. 7. Describe the various publishing methods for mobile applications.   **Learning and Teaching Approach**   |  |  |  | | --- | --- | --- | | **Approach** | **Hours per week** | **Total credit hours** | | Lecture | 3 | 45 | | Project | 3 | 45 | | Independent study | 2 | 30 | | Total | | 120 |   **Assessment Approach**  Assessments will be carried out on a continuous basis through the following modes:  **Assignment(Critical)**  Portion of Final Mark: 10%  Students should submit two assignments of 1000-1500 words related to mobile application development, design for android and IOS to achieve this 10%. The first one will be before the midterm and it constitutes 50% of the total 10% allocated. The topic will be on android. The next assignment, for the other 50%, will be done after the midterm on IOS.  Assignments will be evaluated on:  30% - Explanation of the purpose /objectives  50% - Explanation on its applications  20% - Quality of the writing (language, referencing, etc.)  **Project (Creative and Critical)**  Portion of final marks: 20%  This project is assigned at the start of the third week and must be submitted before the semester end examination.  Students will work individually to complete a project on mobile apps. This project is to be implemented using mobile apps development framework to assess their understanding of development concepts in order to develop functional apps for a given requirement.  The project will be evaluated based on the following criteria:  6%-Content  6%-Completeness (Requirements met)  2%-Documentation (comments, citations)  4%-Consistency  2%-Timely submission  **Class Test**  Portion of Final Work: 10%  This is a written test conducted within the class for a duration of one hour and covers 2-3 weeks of material. There will be two such tests, one before midterm consisting of topics from the beginning to the quarter point of the subject matter and the other after the midterm consisting of topics from after the midterm to quarter pointer after midterm.  **Mid-semester Examination**  Portion of Final Mark: 20%  This is a college wide examination conducted at the half-way into the semester. This examination is conducted for 1 hour and 30 Minutes and it includes all topics till the half-way point in the subject matter.  **Semester End Examination (SE)**  Portion of Final mark: 40%  This is a written conceptual exam conducted for the duration of 2-3 hours. It will be conducted at the end of semester. The exam comprises all the topics covered in this module in order to test their overall retention of the concepts addressed throughout the module.  **Overview of the assessment approaches and weighting**   |  |  |  | | --- | --- | --- | | **Areas of assessment** | **Quantity** | **Weighting** | | Assignment | 2 | 10% | | Class test | 2 | 10% | | Project | 1 | 20% | | Mid-semester Examination | 1 | 20% | | Total Continuous Assessment (CA) |  | 60% | | Semester End Examination (SE) |  | 40% |   **Prerequisites:** None  **Subject Matter**  **Unit I: Overview of Mobile App Development**   * 1. Transformative devices   2. Reaching customers   3. Changing business process   4. Making money   **Unit II: App Design Issues and Considerations**   * 1. App design   2. Operating system design issues   3. Screen size and orientation issues.   4. Connectivity issues   5. Battery issues   6. Hardware issues   7. Device differences   2.7.1 Android  2.7.2 IOS  2.7.3 Cross platform  **Unit III: Developing the cross-platform app**  3.1 Web Technologies for Mobile Apps  3.1.1 HTML5  3.1.2 JavaScript  3.1.3 CSS  3.1.4 jQuery Mobile  3.1.5 JSON  3.2 Data Input  3.3 Designing Cross-Platform Apps  3.4 Menu-driven Apps  3.5 Local storage  3.6 Canvas drawing graphics  3.7 Server-side storage and sharing  3.8 Maps, location, and multimedia  3.9 Cross-platform and native app development  **Unit IV: Developing for Android**   * 1. Android studio      1. Android manifest      2. Gradle scripts   2. Navigation and interface design      1. Activities, Layouts, and intents      2. Launch icon, navigation bar, buttons and design   3. Persistent data in Android      1. Preferences, files, and database      2. User data entry and retrieval   4. Lists      1. Lists and adapters      2. Data sources   5. Maps and Location      1. Location sensors, maps, and fragments      2. Android permissions model   6. Hardware and sensors access      1. Sensors, managers, and other hardware      2. Battery, phone, camera   **Unit V: Developing for iOS (Optional, may be substituted for Unit IV)**  5.1 Xcode and Swift  5.1.1 User interface  5.1.2 Simulator  5.1.3 Advanced layout  5.1.4 App icons and launch images  5.2 Navigation and interface design  5.2.1 Views and controllers  5.2.2 View, tab bar, and navigation  5.2.3 Auto layout  5.3 Persistent data in iOS  5.3.1 Defaults  5.3.2 File data storage  5.3.3 Core data  5.3.4 Data among controllers  5.4 Tables in iOS  5.4.1 Tables  5.4.2 Alert Controller  5.5 Maps and location in iOS  5.5.1 Location and mapping  5.5.2 Hardware and sensors  5.5.3 Core location  5.5.4 Map Kit  5.6 Access to hardware and sensors  5.6.1 Device information  5.6.2 Battery, camera, phone, gesture, accelerometer  **Unit VI: Business Issues**   * 1. Monetizing Apps      1. App Monetization Strategies      2. Paid Apps      3. Ad Supported Apps      4. In-App Purchases      5. Subscriptions      6. Understanding the Economics of App Stores      7. Owning Your Own Business   2. Publishing Apps      1. App Distribution through the App/Play Stores         1. Android Play Store Distribution         2. IOS App Store Distribution      2. App Distribution for the Enterprise         1. Android Enterprise Distribution         2. IOS Enterprise Distribution   3. Testing and Fragmentation   **Reading List**  **Essential Reading**  Iversen, J. &Eierman, M. (2018). *Mobile app development for iOS and Android* (2nd ed.). Burlington, VT: Prospect Press.  Lingras, P., Triff, M. &Lingras, R. (2017). *Building cross-platform mobile and web apps for engineers and scientists: An active learning approach* (1st ed.). Boston, MA: Cengage Learning.  **Additional Reading**  Burnette, E.. (2013). *Hello, Android* (3rd ed.). Dallas, Texas: Pragmatic Bookshelf.  Gosling,J., Joy,B., Steele,G., Bracha,G., Buckley, A., & Smith, D. (2017). *The java® language specificatio*n (10th ed.). Redwood Shores, CA: Oracle America, Inc.  Griffiths, D. & ‎Griffiths D. (2015). *Head first Android development: A brain-friendly guide* (1st ed.). Sebastopol, CA: O’Reilly Media, Inc.  Horton, J. (2015). *Android programming for beginners.* Birmingham: Packt Publishing Ltd.  **Date:** Sep,2019. |

**Royal Kasho on Education Reforms:**

* Focus on 21st century learning: curriculum, pedagogy, learning-process, assessments.
* The Content should be integrated with technologies.
* Develop abilities of students to be inquisitive, problem-solvers, interactive and collaborative, self-discovery and exploration.

**Skills: Critical Thinking, Creative Thinking and Collaborative Thinking and Bhutanese values**

**Learning Objective:**

* The learning objective allow students to dive into mobile application development either in android or iOS or cross-platform operating systems. Further, students should be able to develop an application at the end of the module. The involvement of technological aspect of learning through critical and creative thinking are covered.

**Learning Outcomes, Assessments and Subject Matters:**

The Learning outcome, assessments and subject matters of this module aligns with the 21st century’s skills of critical and creative thinking. Students will be allowed to individually design and build a mobile App given a certain requirements which allows them to construct knowledge with the applied logic. They will also be able to involve in decision making process to meet the aspects of mobile Apps such as which testing strategies to use, which platform to use for publishing the app and so on.

Moreover, while building an app, student gets to generate ideas, experiments their ideas whereby strengthening the quality of the App build. These aspects cover up the creative thinking skills.

Regarding the assessments such as Project which are done individually, the collaborative skill of 21st century is lacking as there won’t be any shared understanding of roles and responsibilities. Ideas will be constraints to the individual without the involvement of the team member.

Through this modules, we will be able to generate students who are inquisitive and problem-solver character but they might lack the collaborative skills of the 21st century.

Going into the subject matters, today’s word need apps which runs on both the platform (android and iOS), but the subject matter focuses only on one platform which I feel might lead the students backward in terms of use of technologies.