New York City College of Technology, CUNY

CURRICULUM MODIFICATION PROPOSAL FORM

This form is used for all curriculum modification proposals. See the [Proposal Classification Chart](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-09-Proposal_Classification_Chart.pdf) for information about what types of modifications are major or minor. Completed proposals should be emailed to the Curriculum Committee chair.

|  |  |
| --- | --- |
| **Title of Proposal** | New course on development of advanced mobile applications |
| **Date** | 11/24/17 |
| **Major or Minor** | Major |
| **Proposer’s Name** | Marcos S. Pinto |
| **Department** | Computer Systems Technology |
| **Date of Departmental Meeting in which proposal was approved** | 11/17/17 |
| **Department Chair Name** | Hong Li |
| **Department Chair Signature and Date** | 3/3/2018 |
| **Academic Dean Name** | Kevin Hom |
| **Academic Dean Signature and Date** | C:\Users\khom\Desktop\sign 1.jpg3/5/18 |
| **Brief Description of Proposal**  (Describe the modifications contained within this proposal in a succinct summary. More detailed content will be provided in the proposal body. | This is followed-up course for the existing associate-level course, CST2301 Multimedia and Mobile Devices Programming which is one of the pre-requisite courses for the proposed one. It complements CST2301 by including the development of iOS mobile applications |
| **Brief Rationale for Proposal**  (Provide a concise summary of why this proposed change is important to the department. More detailed content will be provided in the proposal body). | Students that took the associate-level mobile course, CST2301 will be taught how to develop advanced applications for both mobile platforms: Android (Google) and iOS(Apple). |
| **Proposal History**  (Please provide history of this proposal: is this a resubmission? An updated version? This may most easily be expressed as a list). | This is the first submission – 3/5/2018  2nd revision 11/5/2018 |

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

|  |  |
| --- | --- |
| **Course Title** | Development of Advanced Mobile Applications |
| **Proposal Date** | 03/02/18 |
| **Proposer’s Name** | Marcos S. Pinto |
| **Course Number** | CST3601 |
| **Course Credits, Hours** | 3 credits, 3 hours |
| **Course Pre / Co-Requisites** | CST2301Multimedia and Mobile Device Programming and CST3513 Object-Oriented Programming in Java |
| **Catalog Course Description** | Intended as an elective for the BT major, this course focuses on developing advanced mobile applications for two of the major platforms: Android (Google) and iOS (Apple). These applications will be supported by Java and Swift programming languages respectively. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | The proposed course is designed to teach the students the basics of developing iOS applications using Swift and then move into the creation of more complex applications for both platforms: Android and iOS. This new course is proposed based on the following considerations:  1. The current associate-level mobile course CST2301, Multimedia and Mobile Device Programming, is an introduction to the development of basic mobile applications for devices running Google's Android operating system. The new proposed course gives the student the means to develop mobile applications for the two major mobile platforms: Android and iOS. Students will develop advanced (more complex) applications alternating between these two operating systems.  2. To focus on giving the students the tools to build more 'intelligent' mobile applications with the inclusion of Artificial Intelligence to some of the applications. The new course being proposed teaches developing mobile applications using two of standard programming languages for mobile development.  3. The proposed course will cover the syntax and semantic of both languages, Java and Swift, the tools and standards related to Android and iOS, and the Java and Swift technologies used to build these mobile applications. |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | N/A |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | NO |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | N/A |
| N/A |
| N/A |
| **Intent to Submit as a Writing Intensive Course** | No |

Please include all appropriate documentation as indicated in the NEW COURSE PROPOSAL Combine all information into a single document that is included in the Curriculum Modification Form.

**Proposed Course Name: Development of Advanced Mobile Applications**

**Course Overview & Rationale**

The proposed course is designed to teach the students the basics of developing iOS applications using Swift and then move into the creation of more complex applications for both platforms: Android and iOS. This new course is proposed based on the following considerations:

1. The current associate-level mobile course CST2301, Multimedia and Mobile Device Programming, is an introduction to the development of basic mobile applications for devices running Google's Android operating system. The new proposed course gives the student the means to develop mobile applications for the two major mobile platforms: Android and iOS. Students will develop advanced (more complex) applications alternating between these two operating systems.
2. To focus on giving the students the tools to build more 'intelligent' mobile applications with the inclusion of Artificial Intelligence to some of the applications. The new course being proposed teaches developing mobile applications using two of standard programming languages for mobile development.
3. The proposed course will cover the syntax and semantic of both languages, Java and Swift, the tools and standards related to Android and iOS, and the Java and Swift technologies used to build these mobile applications.

**Course Need**

**Students who would take this class:** students in the BTech program

**Department**: Computer Systems Technology

**Program**: Bachelors in Technology

**The number of section (s) anticipated:** one section for the first year

**Projected headcount:** 24students

**Physical Resources required:** Basicsmartroomset**-**up**:** a screen, and an overhead projector/a TV set that is run by and connected to a computer

**Course overlap:** None

**Faculty** **qualified** **for** **teaching** **this** **course**: Yes, there are faculty members who have doctoral degrees in Computer Science with the concentration in computer application development for various domains.

**Course design**

**Course context:** This course will be offered as an elective in the BTech program. Students are required to develop an independent project at the end of the semester.

**Course** **structure**: This course will be offered in a lecture style/format.

**Anticipated** **Pedagogical** **Strategies** **and** **Instructional** **Design**: This class will be run in a lecture-activity style/format. The class will start with a lecture, and then move on to creative in-class activities, such as using Java-based and Swift0based programming languages to develop mobile applications for the two most known platforms of mobile devices: Android and iOS.

**Providing Support to Programmatic Learning Outcomes:** This course requires satisfactory completion of individual assignments, two major exams and a final term project.

# New York City College of Technology/CUNY

**Computer Systems Technology Department**

**CST3601 – Development of Advanced Mobile Applications**

**(**3 credits, 2 class hours, 2 lab hours)

**Course Description:**

This course will teach students how to develop advanced mobile applications in two different platforms. The students will learn how to create complex mobile applications for either technologies Android or iOS mobile devices. They will implement GUI applications in Object Oriented context using the corresponding Integrated Development Environment (IDE). The course is entirely hands-on on both platforms with individual project assignment. It is hybrid course evenly-divided with mobile applications being developed using native code, Swift for iOS applications and Java for Android applications.

**Course Objectives:**

Upon successful completion of the course, the student should be able to:

1. Understand the Java/Swift environment and their use of GUI libraries and events for mobile devices.
2. Be familiar and experienced with the Android Studio and xCode development environment.
3. Create simple to complex applications to illustrate the Android and iOS based applications.
4. Overcome the complexities/challenges in developing complex applications using both programming languages.

General Education Outcomes:

1. Skill/Inquiry/Analysis: Students will employ scientific reasoning & logical thinking.
2. Skill/Communication: Students will communicate in diverse settings and groups, using written (reading and writing), oral (speaking and listening), and visual means
3. Values/Ethics/Relationships/ Professional/Personal Development: Students will work with team to build consensus, respect and the use of creativity.

**Prerequisite:**

CST3513Object-Oriented Programming in Java and CST2301Multimedia and Mobile Device Programming

**Required Text:**

Required:Beginning iOS Programming with Swift (ebook), Simmon Ng, Appcoda Limited

Reference: Android Programming Concepts, T.Cornez & R.Cornez, Jones & Bartlett

**Evaluation and Grading:**

Midterm 35%

Final 35%

Project 20%

Participation, Tests 10%

Total 100%

## Grade System\*:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | A | A- | B+ | B | B- | C+ | C | D | F |
| Range | 93-100 | 90-92.9 | 87-89.9 | 83-86.9 | 80-82.9 | 77-79.9 | 70-76.9 | 60-69.0 | <= 59.9 |

\* All CST students must attain a grade of C or better in all CST courses

**Academic Violation:**

The instructor has the authority to give a grade of **F** if the student submits the work of

another person in a manner that represents his/her work, or knowingly permits one’s

work to be submitted by another person without the instructor’s permission.

**Course Syllabus**

|  |  |
| --- | --- |
| **Week** | **TOPIC** |
| 1, 2 | Introduction to iOS: Xcode(IDE), Swift Playgrounds, Hello World App, AutoLayout, Prototyping |
| 3, 4 | iOS: Creating a Simple Table-based app with Table Views using Prototype Cell, adding more screen objects: ListView, Spinner, Intent |
| 4, 5 | iOS: Creating Custom Action Button, Model-View Controller(MVC), Navigation Controller, More concepts of Object-Oriented Programming (OOP) language |
| 6, 7 | iOS & Android: Working with Table Cells and Dynamic Type, Developing Basic Animations with Visual Effects |
| 8 | iOS & Android: Working with Maps including Static Table Views |
| 9 | iOS & Android: Core Data, Search Bar  **Midterm** |
| 10, 11 | iOS & Android: Working with SQLiteDatabase, WalkThrough Screens, PageViewController |
| 12 | iOS & Android: Building app with Tab Bars, Storyboard References, WKWebView, ViewController, and Canvas |
| 13 | iOS & Android: Exploring CloudKit, Deploying and Testing App in Real iOS Device or Android Device |
| 14 | iOS & Android: Beta Testing with TestFlight, 3D Touch, Submitting App to App Store or Google Play Store |
| 15 | iOS & Android: Review  **FINAL** |

**Course Assessment:**

|  |  |
| --- | --- |
| **For the successful completion of this course a student should be able to:** | **Evaluation methods and criteria** |
| Describe the challenges, opportunities and constraints working with Java GUI libraries and events | Students will have developed/modified programs that illustrate principles of Java based GUI applications |
| Design a user interface on a mobile device to capture user input and take business action | Students’ ability to create user interfaces using forms and canvas techniques |
| Create applications that handle events | Students will use Java based event listeners and handlers to respond to user actions. |
| Appreciate the challenges of handling game playing applications | Students will document/answer questions on issues of animation within game playing |
| Utilize an iOS application to perform an animation based procedure. | Students will use the Xcode IDE to develop applications with iOS classes. |

**General Education Outcomes and Assessment:**

|  |  |
| --- | --- |
| **Learning Outcomes** | **Assessment Method** |
| **SKILLS/Inquiry/Analysis** Students will employ scientific reasoning and logical thinking. | Students will describe problem, identify inputs, processes and desired outcomes in assignments, class work and tests.  Students will solve problems in assignments, class work and tests. Students will identify coding paradigms in assignments, class work and tests |
| **SKILLS/Communication**  Students will communicate in diverse settings and groups, using written (both reading and writing), oral (both speaking and listening), and visual means | Students will present their analysis of mobile apps in written/oral form.  Students will display the Catalog project to the class detailing key technical objectives met. |
| **Values, Ethics, Relationships/ Professional/Personal Development**  Students will work with teams, including those of diverse composition. Build consensus. Respect and use creativity. | Students will demonstrate creativity in modifying mobile apps to meet the user needs. |

**Bibliography**

1. J. Iversen, M. Eierman, “*Learning Mobile App Development: A Hands-on Guide to Building Apps with iOS and Android / Edition 1”,* Addison-Wesley Professional, 2014, ISBN: 9780321947864

2. F. Zammetti, “*Pro iOS and Android Apps for Business: with jQuery Mobile, node.js, and MongoDB”*, Apress, 2013, ISBN: 978-1-4302-6070-7

3. T. J. Duffy, “Programming with Mobile Applications: Android, iOS, and Windows Phone 7“, Cengage Learning, 2012, ISBN: 9781133628132

4. T. Cornez, R. Cornez,”*Android Programming Concepts*”, Jones & Bartlett Learning, 2017, ISBN: 9781284070705

5. M. Neuburg, “i*OS11 Programming Fundamentals with Swift*”, O'Reilly, 2018, ISBN: 978-1491999318

6. A. J. Wagner, G. Scalzo, J. Hoffman, “*Swift: Developing iOS Applications”,* Packt Publishing Limited, 2016, ISBN: 9781787120242

7. J. Horton, H. Vasconcelos, R. Portales, “*Android: Programming for Developers*”, Packt Publishing Limited, 2016, ISBN: 9781787123694

8. H. Franceschi, “*Android App Development*”, Jones & Bartlett Learning, 2018, ISBN: 9781284092127

9. J. Hoffman, “*Mastering Swift 3*”, Packt Publishing Limited, 2016, ISBN: 9781786466129

10. J. Horton, “Learning Java by Building Android Games”, Packt Publishing Limited, 2015, ISBN: 9781784398859

**Chancellor’s University Reports**

# Section AIV: New Courses

## Please fill in all applicable fields.

|  |  |
| --- | --- |
| **Department(s)** | Computer Systems Technology |
| **Academic Level** | **[ X ] Regular [ ] Compensatory [ ] Developmental [ ] Remedial** |
| **Subject Area** |  |
| **Course Prefix** | CST |
| **Course Number** | 3601 |
| **Course Title** | Development of Advanced Mobile Applications |
| **Catalog Description** | Intended as an elective for the BT major, this course focuses on developing advanced mobile applications for two of the major platforms: Android (Google) and iOS (Apple). These applications will be supported by Java and Swift programming languages respectively. |
| **Prerequisite** | CST3513Object-Oriented Programming in Java and CST2301Multimedia and Mobile Device Programming |
| **Corequisite** | None |
| **Pre- or corequisite** | None |
| **Credits** | 3 |
| **Contact Hours** | 2 lecture hours and 2 lab hours |
| **Liberal Arts** | **[ ] Yes [ X] No** |
| **Course Attribute (e.g. Writing Intensive, etc)** | Hands-on coding in programming languages |
| **Course Applicability** | |  |  |  | | --- | --- | --- | | **[X ] Major** |  | | | **[ ] Gen Ed Required** | **[ ] Gen Ed - Flexible** | **[ ] Gen Ed - College Option** | | **[ ] English Composition** | **[ ] World Cultures** | **[ ] Speech** | | **[ ] Mathematics** | **[ ] US Experience in its Diversity** | **[ ] Interdisciplinary** | | **[ ] Science** | **[ ] Creative Expression** | **[ ] Advanced Liberal Arts** | |  | **[ ] Individual and Society** |  | |  | **[ ] Scientific World** |  | |
| **Effective Term** | Fall 2019 |

**Rationale: The rationale is one or two sentences explaining where the course fits into the curriculum and why it is being introduced. Must include at least one title and IRP code of a program to which the new course is applicable, as per SED regulation.**

The proposed course is designed to complement the teaching of the development of mobile applications. Currently the course offered at the Associate-level, CST2301, is an elective course where students learn how to create mobile applications for the Android platform which is one of the most used platform for mobile devices. The proposed course not only will include the development of mobile applications for the other platform, iOS, but also the course will teach students how to develop more complex mobile applications in both platforms.

Students taking Bachelors-level courses in the Software Development track are required do take, CST3513, which is one the pre-requisites of the proposed course and the students are required to have two electives 300- or 400-level courses and the proposed course could be one of these elective courses.

**LIBRARY RESOURCES & INFORMATION LITERACY: MAJOR CURRICULUM MODIFICATION**

Please complete for all major curriculum modifications. This information will assist the library in planning for new courses/programs.

Consult with your library faculty subject specialist (http://cityte.ch/dir) 3 weeks before the proposal deadline.

Course proposer: please complete boxes 1-4. Library faculty subject specialist: please complete box 5.

|  |  |  |
| --- | --- | --- |
| 1 | Title of proposal  New course: CST3601 Development of Advanced Mobile Applications | Department/Program  Computer Systems Technology/Bachelor of Technology |
|  | Proposed by (include email & phone)  Marcos S. Pinto  mpinto@citytech.cuny.edu  (718) 260-5100 | Expected date course(s) will be offered  Fall 2019  # of students 24 |

|  |  |
| --- | --- |
| 2 | The library cannot purchase reserve textbooks for every course at the college, nor copies for all students. Consult our website (http://cityte.ch/curriculum) for articles and ebooks for your courses, or our open educational resources (OER) guide (http://cityte.ch/oer). Have you considered using a freely-available OER or an open textbook in this course?  Yes, the proposed textbook is an ebook |

|  |  |
| --- | --- |
| 3 | Beyond the required course materials, are City Tech library resources sufficient for course assignments? If additional resources are needed, please provide format details (e.g. ebook, journal, DVD, etc.), full citation (author, title, publisher, edition, date), price, and product link.  Yes. The library subscribes to sufficient number of journals and databases in which students will find information and instructions on how to complete the courses' assignments. |

|  |  |
| --- | --- |
| 4 | Library faculty focus on strengthening students' information literacy skills in finding, critically evaluating, and ethically using information. We collaborate on developing assignments and customized instruction and research guides. When this course is offered, how do you plan to consult with the library faculty subject specialist for your area? Please elaborate.  Most definitely so. This courses is on a very important area of IT, mobile applications, which is constantly changing. As new research papers on this subject are being published we will contact the library for the availability of these papers and in case necessary request for the possibility of having them accessible for our students. |

|  |  |
| --- | --- |
| 5 | Library Faculty Subject Specialist Prof. Junior Tidal  Comments and Recommendations  After surveying the collection, I believe that the library can adequately support this course. Based upon course approval, I would also suggest acquiring more monographs regarding app development, including titles that cover XCode, mobile IDE, and iOS. I would also suggest that the library acquire software to support students’ development including IDEs and emulators. Additional hardware to augment our loanable collection of iPads may also be necessary for students.  Date 11.27.17 |