

**Department of Computer and Electrical Engineering and Computer Science
Florida Atlantic University
Course Syllabus**

1. Course title/number, number of credit hours	
Android Mobile Component Development, COT 6930	3 credit hours
2. Course prerequisites, co requisites, and where the course fits in the program of study	
Prerequisites: Java and XML	
3. Course logistics	
<p><i>Term:</i> summer 2012</p> <p>The course will explore ways to incorporate tools, methodologies, and libraries to rapidly develop optimized Android applications. Android provides substantial support. The course will attempt to go further in taming the complexity and facilitating application development. Complete application development is not a goal here. You will be given existing Apps; Your responsibility is to use them to develop Android library/tool/methodology to improve such Apps with regard to user/programmer/component developer experience. SDK kit and emulation will be used in the course. Android phones and Tablets supporting Android 2.2, 3.x, and 4.x are available for testing. Either you already are familiar with Android smart phone App development or you will learn the same within the first four weeks of the semester. I will give you access to material (tutorials, videos, applications, etc., to get you up to speed). I will also cover such material in the class, in an accelerated fashion.</p> <p>Preparation before the class: Installation of Android or Motodev SDK, and emulation of a few Apps. To the extent possible, class related installations will be assigned ahead of the lecture, so we can spend class time discussing the topic and any installation related issues. Project focus areas (items 5 to 10) are to expose you to possibilities. You will use that to develop a set of helper classes, a tool, or a methodology, for a specific application domain. To accommodate students new to Android, only 3 of the 6 topics will be covered this summer, dependent on student interest.</p>	
4. Instructor contact information	
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. R. Shankar, Professor, in collaboration with Prof. McAfee, Arts & Letters Engineering East (EG-96) Bldg., Room 513 MW 1 to 2.30 PM, , Android On-line sessions at: T 7 to 8.30 PM, R Sa 10 AM to 11.30 AM 561-297-3470 shankar@fau.edu
5. TA contact information	
None	
None	
6. Course description	
Software tool and library development for the Android mobile platform using Java and XML, to facilitate rapid development of optimized Android applications.	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	This course is designed to help graduate students develop research skills as pertinent to software and systems engineering. We use open source

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	tools (Eclipse and Android SDK) and languages. Thus, the source code and flow are available for inspection and adoption, so one can build advanced components based on one's own skills and knowledge.		
<p><i>Student learning outcomes & relationship to ABET a-k objectives:</i> <i>We believe that our course addresses all of the ABET sub-criteria a-k, but for the following: d.</i></p>	<p>(a) an ability to apply knowledge of mathematics, science, and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (d) an ability to function on multidisciplinary teams (e) an ability to identify, formulate, and solve engineering problems (f) an understanding of professional and ethical responsibility (g) an ability to communicate effectively (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (i) a recognition of the need for, and an ability to engage in life-long learning (j) a knowledge of contemporary issues (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.</p>		
8. Course evaluation method			
<p>Quizzes (8, drop two lowest scores) 20% Midterm Exam (around week 6) 20% Project Assignments (4) , Week 6 on 40% Final Project Demo and Report 20% Bonus: Android Community Help 10%</p>	<p>(on concepts and focus areas) (on Android concepts) (on proposal and interim reports) (video/live Demo and Report) (via blogs, tutorials & links)</p>	<p><i>Note: The minimum grade required to pass the course is C.</i></p>	
9. Course grading scale			
<p>Grading Scale: It will not be based on a curve. Expected distribution is given below: 90 and above: "A", 85-89: "A-", 80-84: "B+", 75-79: "B", 70-74 : "B-", 65-69: "C+", 60-64: "C", 55-59: "C-", 50-54: "D+", 45-49: "D", 40-44: "D-", 39 and below: "F."</p>			
10. Policy on make-up tests, late work, and incompletes			
<p><i>There is a mid-term test in this course. The students will make a presentation on the project chosen. .</i></p> <p><i>A grace period of 1 week is allowed for submission of assignments. Two lowest score quizzes will be dropped.</i></p> <p><i>Incomplete grades are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.</i></p>			
11. Special course requirements			
<p>Students are expected to conduct domain analysis, identify use cases, and develop a user friendly environment, so their component will make it easy for non-expert engineers to use this specialized resource. Eclipse has many plug-ins that they can study, and learn from the accepted methods and templates. There will be an orientation quiz that the students will take and pass with 100% score. The intent is to make sure that the students know that this is applied research oriented, with a substantial</p>			

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responsibility on the student to use tools and techniques presented in the class, to develop and validate their own components. Blogs will allow the students to learn from each other.

12. Classroom etiquette policy

Students have to use laptops in the class to conduct tool installation, training, programming, etc. Also, classes will be more problem solving oriented – you will be asked to read and try out tutorials ahead of time. There will be significant interaction among the students and the professor during the class room, on a basis to solve problems and gain deeper insight. This will be tested in a weekly quiz in the following week. So, have your laptop ready and be prepared to use it during the lectures. Here is a site with Net Etiquette rules: <http://www.albion.com/netiquette/corerules.html> - please familiarize yourself with it.

13. Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.

14. Honor code policy

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

We will use mostly open source tools. Much code, tutorial, java docs, etc., are freely available at many sites on line, including our own, android.fau.edu, d.android.com, www.eclipse.org, and others. The students will use open source tools and standard languages such as Java, XML, and UML in developing their flow. All of the open source community believes in free sharing of their intellectual contributions. We encourage the same of all our students. Maintain your blog sites, review others' blog sites, and find ways to help each other. Acknowledge any help you received from your colleagues and on-line resources.

15. Required texts/reading

Murphy, Mark L. The Busy Coder's Guide to Advanced Android, CommonsWare, March 2012, ISBN: 978-0-9816780-5-4.. This was made available free of cost by the publisher and author for our course.

16. Supplementary/recommended readings

Murphy, Mark, L., Android Programming Tutorials, CommonsWare, Nov 2011, ISBN: 978-0-9816780-7-8.
Murphy, Mark, L., Tuning Android Applications, CommonsWare, Oct 2011, ISBN: 978-0-9816780-6-1
Murphy, Mark L., The Busy Coder's Guide to Android Development, CommonsWare, Nov 2011, ISBN: 978-0-9816780-0-9 – All these three books have been made available free for this course.

d.android.com and www.eclipse.org

17. Course topical outline, including dates for exams/quizzes, papers, completion of reading

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1. Brief Intro to Android: Overview, Life cycle, components, and overall structure (2 lectures)
2. Applications: Emphasis on different components and simple Apps (2 lectures)
3. Frameworks – JAR, JUnit, Jena, Javadoc, and Android Scripting (5 lectures)
4. Mid-term Exam: Android material covered in the classes, quizzes, and assignments (1 lecture)
5. Web Services - Patterns and On-line resources (3 lectures)
6. NDK and SDK – Multimedia and Optimization (3 lectures)
7. Concurrency – Bluetooth and Threads (3 lectures)
8. Hardware – Sensors and DSP (3 lectures)
9. Databases – SQLite and Semantic Web (3 lectures)
10. Graphics and Animation – Unity and Open GL ES (3 lectures)
11. Individual Project: on any tool, methodology, or library component development. This will be based on your background and interest, but will focus on one of the items 5 through 10 above, in terms of improving the experience of one of the stakeholders (user /programmer/component developer) . .

Dates Quizzes- During Weeks 3 to 12, once per week
 Mid-Term exam – Week 7 (1 hour)
 Project Assignments – Weeks 8 to 11, one per week
 Design Report and Documentation – Due on last Friday of the Final Exam week
 Demo, Presentation, & Video – on Exam day at scheduled time (20 minutes)

18. Technical Resolution Policy - You will be using Blackboard tools for communication. On the Welcome page, once you log in, you have the option to Submit a Ticket (see on the left hand side) to the Online Support Center. They may also be reached at 561-297-3999. However, they will not be able to help you with the installation and use of the tool suite used in the class. We have excellent tutorials at android.fau.edu and many on-line sites. First try these things and if you still have difficulties, feel free to contact Dr. Shankar.

19. Test Policy – (1) The Quizzes will be available on-line. These will typically require the use of tools, references, and resources to answer questions on programming, debugging, testing, application components, software engineering, system design, etc., as pertinent to that week's material covered and/or that week's project focus. These are expected to take about 1 hour to discuss and respond. **(2)** The Mid Term exam will be one hour long and will be individual. It is meant to ensure that you understand the basic principles before you undertake App development. It will be open notes, open book, and available on-line over a 48 hour period. Questions will be drawn from a large pool of multiple choice and fill-in-the-blank types of questions. They will be randomly assigned to you when you sign in. You will be able to pause and continue the exam – but plan on being available continuously for about 1.5 hours, assuming you will take breaks in-between. It will not be timed. **(3)** The project assignments will help you develop your project in stages, viz., mind mapping, use cases, class diagrams, patterns, GUI, and report generation. Sufficient examples will be made available. If a presentation, they will last about 10 minutes per student. If a report, it probably will be about 7 to 10 slides/pages for the submission. **(4)** Design Report will be a 6 to 7 page report written in the style of a conference paper, which may get submitted to a conference. Documentation is expected to document all the work accomplished (slides, assets, code, test suites, demo, etc.,) so we have all the material to improve upon it. These are due at the end of the semester, three days before the grades are to be posted. **(5)** Demo, Presentation, and Video – These are due on the final exam day at the exam time – you will make a 10 minute presentation on campus or remotely. **Final Note: We expect to assign some extra points to you if you provide constructive ideas / useful resources for other students. This help is welcome during the semester too – for example, you might find a new good tutorial on a particular aspect. Post it at the Blackboard discussion site and get extra points. We call this “Android Community Service” in our grading scheme. This is worth 10% of the grade, as bonus.**

20. Other Important Information - This is a distance learning course with strong emphasis on projects. You will be developing research skills as part of this course.

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I have prepared a list of FAQs under the title "Prerequisites and Expectations." It is posted on the 'Start Here' page of the Blackboard site. Please post your questions/concerns there. I will respond soon after.

By the end of Week 1, you should have signed two forms (photo and video release form and IP release form). Details will be provided in the Week 1 folder. You should also take the Orientation test and pass the test with 100% score. This will ensure that we have divulged all the aspects of this course ahead of time and you have read and agree with those aspects.

21. Technology Requirements:

General System Requirements for Android SDK

Supported Operating Systems

- Windows XP (32-bit) or Vista (32- or 64-bit) or Windows 7
- Mac OS X 10.4.8 or later (x86 only)
- Linux (tested on Linux Ubuntu Hardy Heron)
 - 64-bit distributions must be capable of running 32-bit applications. For information about how to add support for 32-bit applications, see the [Ubuntu Linux installation notes](#).

Supported Development Environments

- Eclipse IDE
 - [Eclipse 3.4 \(Ganymede\)](#) or [3.5 \(Galileo\)](#)
 - Note: Eclipse 3.3 has not been tested with the latest version of ADT and support can no longer be guaranteed. We suggest you upgrade to Eclipse 3.4 or 3.5.
 - Recommended Eclipse IDE packages: Eclipse IDE for Java EE Developers, Eclipse IDE for Java Developers, Eclipse for RCP/Plug-in Developers, or Eclipse Classic (3.5.1+)
 - Eclipse [JDT](#) plugin (included in most Eclipse IDE packages)
 - [JDK 5 or JDK 6](#) (JRE alone is not sufficient)
 - [Android Development Tools plugin](#) (optional)
 - Not compatible with Gnu Compiler for Java (gcj)
- Other development environments or IDEs
 - [JDK 5 or JDK 6](#) (JRE alone is not sufficient)
 - [Apache Ant 1.6.5](#) or later for Linux and Mac, 1.7 or later for Windows
 - Not compatible with Gnu Compiler for Java (gcj)

Note: If JDK is already installed on your development computer, please take a moment to make sure that it meets the version requirements listed above. In particular, note that some Linux distributions may include JDK 1.4 or Gnu Compiler for Java, both of which are not supported for Android development.

Hardware requirements

- For the base SDK package, at least 600MB of available disk space. For each platform downloaded into the SDK, an additional 100MB is needed.

General System Requirements for MOTODEV Studio

MOTODEV Studio for Android is tested for compatibility with the following systems. Although MOTODEV Studio may be compatible with other systems, Motorola offers support only for the systems described below, in terms of backward compatibility. Most current operating systems released during 2011 or earlier should be supported. Use the following info as a guide. The installation tutorial will help you make the final decision.

Microsoft Windows

- Microsoft Windows XP Professional Version 2002 with Service Pack 3
- Java™ Runtime Environment (JRE) 6.0 Update 13
- Intel® Core™ 2 Duo CPU, 2.33 GHz

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- 2 GB RAM
- Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android™ SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)

Mac OS X

- Mac OS X version 10.5.7
- Java 2 Runtime Environment, Standard Edition 5.0 32-bit
- Intel Core 2 Duo CPU, 2.4 GHz
- 4 GB RAM
- Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)

Ubuntu Linux

- Ubuntu Linux version 9.0.4
- GNOME version 2.26.1
- Java™ Runtime Environment (JRE) 6.0 Update 14 32-bit
- Intel Core 2 Duo CPU, 2.4 GHz
- 2 GB RAM
- Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)

Fedora Linux

- Fedora Linux version 11
- KDE version 4.2.2
- Java™ Runtime Environment (JRE) 6.0 Update 14 32-bit
- Intel Core 2 Duo CPU, 2.4 GHz
- 2 GB RAM
- Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)