INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

INFORMATION TECHNOLOGY

COURSE DESCRIPTION FORM

Course Title	**Mobile Application Development**			
Course Code	**A70535**			
Class	**IV B. Tech I Semester-R15**			
Course Structure	**Lectures**	**Tutorials**	**Practicals**	**Credits**
	4		**-**	**4**
Course Coordinator	**Mr. D Rahul, Assistant Professor, Dept of IT.**			
Course Faculty	**Mr. D Rahul, Assistant Professor, Dept of IT.**			

I. COURSE OVERVIEW

The Java 2 Micro Edition (J2ME) provides a programming platform for a wide range of mobile and embedded devices. This course focuses on the java API'S and tools necessary for developing J2ME applications for mobile computers and telephones. it covers the necessary language features for mobile programming and focuses particularly on the Mobile Information Device Profile(MIDP) used in mobile phone application development. The course project presents students with considerable opportunity for hands-on experience, developing mobile software for realistic problem using an iterative development approach. Delegates will build a mobile application interface using J2ME, connecting via HTTP to the web tier interface of a Java application.

II. PREREQUISITE(S)

Level	Credits	Periods	Prerequisite
UG	4	5	Java Programming

III. MARKS DISTRIBUTION

Sessional Marks	University End Exam Marks	Total Marks
There shall be two midterm examinations. Each midterm examination consists of essay paper, objective paper and assignment. The essay paper is for 10 marks of 60 minutes duration and shall contain 4 questions. The student has to answer 2 questions, each carrying 5 marks. The objective paper is for 10 marks of 20 minutes duration. It consists of 10 multiple choice and 10 fill-in-the blank questions, the student has to answer all the questions and each carries half mark. First midterm examination shall be conducted for the first two and half units of syllabus and second midterm examination shall be conducted for the remaining portion. Five marks are earmarked for assignments. There shall be two assignments in every theory course. Assignments are usually issued at the time of commencement of the semester. These are of problem solving in nature with critical thinking. Marks shall be awarded considering the average of two midterm tests in each course.	**75**	**100**

IV. EVALUATION SCHEME

S.No	Component	Duration	Marks
1	I Mid examination	80 minutes	20
2	I Assignment	--	05
3	II Mid examination	80 minutes	20
4	II Assignment	--	05
5	External examination	3 hours	75

V. COURSE OBJECTIVES

The course should enable the students to:

I. Understand on Mobile Devices and Wireless Communication.

II. Remember the new development Environments.

III. Recall the scope of Mobile Applications in current trends.

IV. Implement JDBC connectivity with mobile applications.

V. Knowledge on Communication protocols needed to develop Mobile applications.

VI. COURSE OUTCOMES

After completing this course the student must demonstrate the knowledge and ability to:

1. Understand the technical challenges posed by current mobile devices and wireless communications; be able to evaluate and select appropriate solutions.
2. Understand and appreciate the need to keep up with rapid changes and new developments; be able to identify current trends in mobile communications technologies and systems.
3. Evaluate suitable software tools and APIs for the development of a particular mobile application and understand their strengths, scope and limitations.
4. Use an appropriate application development to design, write and test small interactive programs for mobile devices.
5. Analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts in OOP.
6. Design and develop java programs, analyzes, and interprets object oriented data and report results.
7. Develop high-level plans for script solutions for mobile and evaluate the post-production outcome.
8. Design scripts to meet given interface and media control requirements.
9. Devise, carry out and evaluate functional test strategies of mobile design
10. Implement and evaluate techniques for the installation of mobile applications and delivery via various channels
11. Explain the principles of technologies which support media production and delivery on a variety of platforms
12. Use Variables, properties and other code elements appropriately to implement the code design.

VII. HOW PROGRAM OUTCOMES ARE ASSESSED

Program outcomes		Level	Proficiency assessed by
PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	S	Assignments
PO2	**Problem Analysis:** An ability to communicate effectively and to prepare formal technical plans leading to solutions and detailed reports for electrical systems	N	Exercise
PO3	**Design/Development of solutions:** To develop Broad theoretical knowledge in Electrical Engineering and learn the methods of applying them to identify, formulate and solve practical problems involving electrical power	H	Assignments , Discussion
PO4	**Conduct investigations of complex problems**: An ability to apply the techniques of using appropriate technologies to investigate, analyze, design, simulate and/or fabricate/commission complete systems involving generation, transmission and distribution of electrical energy	H	Exercise
PO5	**Modern tool usage:** An ability to model real life problems using different hardware and software platforms, both offline and real-time with the help of various tools along with upgraded versions.	N	------
PO6	**The engineer and society**: An Ability to design and fabricate modules, control systems and relevant processes to meet desired performance needs, within realistic constraints for social needs	S	Exercise
PO7	**Environment and sustainability:** An ability To estimate the feasibility, applicability, optimality and future scope of power networks and apparatus for design of eco-friendly with sustainability	S	Discussion, Seminars
PO8	**Ethics:** To Possess an appreciation of professional, societal, environmental and ethical issues and proper use of renewable resources	N	Discussion, Seminars
PO9	**Individual and team work:** An Ability to design schemes involving signal sensing and processing leading to decision making for real time electrical engineering systems and processes at individual and team levels.	S	Discussions
PO10	**Communication:** An Ability to work in a team and comprehend his/her scope of work, deliverables , issues and be able to ,written for effective technical presentation communicate both in verbal.	S	Discussion, Seminars
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	S	Prototype, Discussions
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	N	------

VIII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED

Program Specific Outcomes		Level	Proficiency Assessed by
PSO 1	**Professional Skills:** An ability to understand the basic concepts in Electronics & Communication Engineering and to apply them to various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc.,in the design and implementation of complex systems.	H	Lectures and Assignments
PSO 2	**Software Engineering practices:** The ability to apply standard practices and Strategies in software service management using open-ended programming environments with agility to deliver a quality service for business success.	S	Tutorials
PSO 3	**Successful career and Entrepreneurship:** An understanding of social-awareness & environmental-wisdom along with ethical responsibility to have a successful career and to sustain passion and zeal for real-world applications using optimal resources as an Entrepreneur.	S	Seminars and Projects

N – None **S – Supportive** **H – Highly Related**

IX. SYLLABUS

UNIT – I

J2ME Overview: Java 2 Micro Edition and the world of Java, Inside J2ME, J2ME and Wireless Devices small Computing Technology. Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants.

UNIT – II

J2ME Architecture and Development Environment: J2ME Architecture, Small computing Device Requirements, Run-Time Environment, MIDlet Programming, java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style Multiple MIDLetsinaMidlet Suite, J2ME Wireless Toolkit.J2ME Best Practices and Patterns: The Reality of working in a J2ME World, Best Practices.

UNIT – III

Commands, Items, and Event Processing: J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling. High-Level Display: Screens, Screen Class, Alert Class, Form Class, Item Class, List Class, Test Box Class, Ticker Class. Low-Level Display: Canvas: The Canvas, User interactions, Graphs, Clipping Regions and Animation.

UNIT – IV

Record Management System: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects. Result set, Transaction processing, metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model Program, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tablets, Deleting form a Table. Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWS.

UNIT – V

Generic connection Framework: The connection, Hypertext Transfer Protocol, Communication Management using HTTP commands, Session Management, Transmit as a Background Process.

Text Books:

1.J2ME: The Complete Reference, James Keogh, Tata McGraw HillNetwork analysis - N.C Jagan and C. Lakhminarayana, BS publications.

Reference Books:

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004.
2. Beginning Java ME Platform, Ray Rischpater, A press, 2009
3. Kicking Butt with MIDP and MSA: Creating Great Mobile Applications, 1stedition, J.Knudsen, Pearson Circuits - A.Bruce Carlson, Cengage Learning.

X. COURSE PLAN:

The course plan is meant as a guideline. There may probably be changes.

Lecture No.	Learning Objectives	Topics to be covered	Reference
1	Understanding J2ME	Java 2 Micro Edition and the world of Java	T1 1.1
2	Analyzing Core of J2me	Inside J2ME	T1 1.1.2
3	Differentiate J2ME and Wireless Devices	J2ME and Wireless Devices small Computing Technology	T1 1.2
4	Analysis of Wireless Technology	Wireless Technology	T1 1.3
5-6	Differentiate Radio data Micro wave.	Radio Data Networks, Microwave Technology	T1 1.3.1
7	Understanding Message and PDA	Messaging, Personal Digital Assistants	T1 2.1
8-10	Understanding of J2ME Architecture	J2ME Architecture	T1 2.1.1
11	Analyzing Runtime Environment of J2ME	Small computing Device Requirements, Run-Time Environment	T1 2.1.2
12	Writing MIDlet Programming	MIDlet Programming	T1 2.3
13	Need of Java for J2ME	java Language for J2ME	T1 2.3.1
14	Understanding Tools	J2ME Software Development Kits,	T1 2.3.2
15	Writing Simple Application	Hello World J2ME Style Multiple MIDLets in a MidletSuite	T1 2.3.5
16-19	Understanding J2ME Wireless Tool kit	J2ME Wireless Toolkit	T1 2.4
20	Understanding work flow of J2ME	The Reality of working in a J2ME World	T1 3.2
21-22	Understanding Examples	Best Practices	T1 3.4
23	Learning Commands	Commands	T1 3.7
24	Analyzing Items and Events	Items, and Event Processing	T1 5.1
25	User Interfaces	J2ME User Interfaces	T1 5.2
26	Commands, Items, and Event Processing	Display Class	T1 5.4
27	Understanding basic j2me emulator	The Palm OS Emulator	T1 5.6.1
28	Commands for command class and item class	Command Class, Item Class	T1 5.8
31	Understand Commands for screen class	Screens	T1 5.8
32-34	Commands	Screen Class, Alert Class, Form Class, Item Class,	T1 6.2

35-36	Understand Commands for Test Box, Ticker	Test Box Class, Ticker Class, The Canvas, User interactions	T1 6.3
37-39	Basic knowledge of Animation	Graphs, Clipping Regions, Animation	T1 6.5 to 6.7
40-43	Record Management System	Record Storage, Writing and Reading Records, Record Enumeration	T1 8.1
44-46	Understanding the basic Concept of JDBC	The Concept of JDBC, JDBC Driver Types	T1 8.2.1
47-49	Understanding the basic JDBC Packages	JDBC Packages, Overview of the JDBC Process	T1 8.2.3
50	Describe the Database Connection	Database Connection, statement Objects. Result set	T1 8.4
51	Review Transaction processing	Transaction processing, metadata, Data Types, Exceptions	T1 8.6
52-54	Review basic knowledge of Model Program, Tables, Indexing, Inserting Data into Tables	Model Program, Tables, Indexing, Inserting Data into Tables	T1 8.7
55-58	Understanding tables	Selecting Data from a Table, Metadata, Updating Tablets, Deleting form a Table	T1 9.1
59-61	Understanding tables	Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWS.	T1 9.2
62-63	Describe Hypertext Transfer Protocol	The connection, Hypertext Transfer Protocol, Communication Management using HTTP commands	T1 9.3
64-65	Describe Session Management	Session Management, Transmit as a Background Process.	T1 9.4

XI. MAPPING COURSE OBJECTIVES LEADING TO THE ACHIEVEMENT OF THE PROGRAM OUTCOMES AND PROGRMA SPECIFIC OUTCOMES:

Course Objectives	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I	H	H			S									H	
II	H	S	S		S							S			S
III	S	H	S									S	S		
IV		S		S										H	
V	H	S	H	S											H

S – Supportive **H – Highly Related**

XII. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF THE PROGRAM OUTCOMES ANAND PROGRAM SPECIFIC OUTCOMES:

Course Outcomes	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	H	H	S	H									S	H	S
2	S	H	S											H	
3		S	H	H	S										S
4		H										S			
5	S			H									S	H	
6					S									H	
7	S			H								S			
8	S	H		S									S		S
9		S												H	
10	H	S	H	S										H	S
11	H		H											S	
12		S											S		

S – Supportive **H – Highly Related**

Prepared by: Mr. D Rahul, Assistant Professor

HOD, IT