INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

COMPUTER SCIENCE AND ENGINEERING

COURSE DESCRIPTOR

Course Title	**MOBILE APPLICATIONS AND SERVICES**				
Course Code	**BCSB22**				
Programme	**M.Tech (CSE)**				
Semester	**III**				
Course Type	**ELECTIVE**				
Regulation	**R18**				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	**-**	**3**	**-**	**-**
Course Faculty	**Ms. B. Vijaya Durga, Assistant Professor**				

I. COURSE OVERVIEW:

This course is offered for those who are interested in understanding and building systems support mechanisms for mobile computing systems including client-server web/database/file systems, and mobile ad hoc and sensor networks for achieving the goal of anytime, anywhere computing in wireless mobile environments. The technologies involved to realize such a system will be covered and the fundamental concepts of mobile computing are introduced. These include mobility and service management, data management, routing in mobile ad hoc and sensor networks, and security issues for mobile systems. While mobile computing covers many topics, in this course our main focus will be on mobility, data and service management, and security issues in mobile computing environments

II. COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites	Credits
-		-	-	-

III. MARKS DISTRIBUTION:

Subject	SEE Examination	CIE Examination	Total Marks
Mobile Applications and Services	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✔	LCD / PPT	✔	Seminars	✔	Videos	✔	MOOCs
✔	Open Ended Experiments						

V. EVALUATION METHODOLOGY:

The course will be evaluated for a total of 100 marks, with 30 marks for Continuous Internal Assessment (CIA) and 70 marks for Semester End Examination (SEE). Out of 30 marks allotted for CIA during the semester, marks are awarded by taking average of two CIA examinations or the marks scored in the make-up examination.

Semester End Examination (SEE): The SEE is conducted for 70 marks of 3 hours duration. The syllabus for the theory courses is divided into FIVE modules and each module carries equal weightage in terms of marks distribution. The question paper pattern is as follows. Two full questions with "either" or "choice" will be drawn from each module. Each question carries 14 marks. There could be a maximum of two sub divisions in a question.
The emphasis on the experiments is broadly based on the following criteria:

50 %	50 % To test the objectiveness of the concept.
50 %	To test the analytical skill of the concept OR to test the application skill of the concept.

Continuous Internal Assessment (CIA):

CIA is conducted for a total of 30 marks (Table 1), with 25 marks for Continuous Internal Examination (CIE), 05 marks for Technical Seminar and Term Paper.

Table 1: Assessment pattern for CIA

Component	**Theory**		**Total Marks**
Type of Assessment	**CIE Exam**	**Technical Seminar and Term Paper**	
CIE Marks	25	05	30

Continuous Internal Examination (CIE):

Two CIE exams shall be conducted at the end of the 9th and 17th week of the semester respectively. The CIE exam is conducted for 25 marks of 2 hours duration, consisting of 5 one mark compulsory questions in part-A and 4 questions in part-B. The student has to answer any 4 questions out of five questions, each carries 5 marks. Marks are awarded by taking average of marks scored in two CIE exams**.**

Technical Seminar and Term Paper:

Two seminar presentations and the term paper with overview of topic are conducted during II semester. The evaluation of technical seminar and term paper is for maximum of 5 marks. Marks are awarded by taking average of marks scored in two Seminar Evaluations.

VI. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes (POs)		Strength	Proficiency assessed by
PO 1	**Engineering Knowledge:** Apply advanced level knowledge, techniques, skills and modern tools in the field of computer aided engineering to critically assess the emerging technological issues.	3	Seminar and Term paper
PO 2	**Develop Novel Designs**: Have abilities and capabilities in developing and applying computer software and hardware to mechanical design and manufacturing fields.	3	Guest Lecture
PO 3	**Analyze Complex Systems:** Conduct experimental and/or analytical study and analyzing results with modern mathematical / scientific methods and use of software tools.	3	Seminar and Term paper
PO 4	**Development of Solutions:** Independently carry out research / investigation and development work to solve practical problems..	3	Seminar and Term paper
PO 5	**Teamwork and Project Management:** Function on multidisciplinary environments by working cooperatively, creatively and responsibly as a member of a team.	3	Seminar and Term paper

3 = High; 2 = Medium; 1 = Low

VII. COURSE OBJECTIVES:

The course should enable the students to:

I. Understand the three main mobile platforms and their ecosystems, namely Android, iOS, and Phone Gap / Web OS and designing and develop mobile applications using a chosen application development framework

II. Explores emerging technologies and tools used to design and implement.

III. Explore the techniques for deploying and testing mobile applications, and for enhancing their performance and scalability account of communications via network by wireless connectivity.

IV. Prepare mobile application for multimedia and learn about additional issue like security, hacking etc.,

VIII. COURSE OUTCOMES (COs):

Students, who complete the course, will have demonstrated the ability to do the following:

COs	Course Outcomes	CLOs	Course Learning Outcomes
CO1	Understand the mobile platforms and their ecosystems with frameworks, tools..	CLO1	Understand the concept of mobile computing in terms of knowledge.
		CLO2	Analyze the frameworks and tools for Android development
		CLO3	Identify generic UI development android user
CO2	Understand more on mobile computing UIS and synchronization and replication of mobile data	CLO4	Estimate the VUIs and mobile apps of development
		CLO5	Identify the state machine, correct communications model, android networking and web.
		CLO6	Explain about the synchronization and replication of mobile data
CO3	Prepare a well -structured network connectivity and notifications with wireless connectivity.	CLO7	Understand the database issues of android applications
		CLO8	Classify the Android telephony notifications and alarms

		CLO9	Develop the Android field service app for runtime environment.
CO4	Explore on various multimedia agents of architecture, models and design	CLO10	Understand and develop packaging and deploying
		CLO11	Examine the performance best practices of applications
		CLO12	Apply the Android multimedia on additional issues
CO5	Understand the security and hacking issues while active transactions in processed	CLO13	Differentiate the mobile agents and peer-to-peer architecture, Android multimedia
		CLO14	List out the platforms and additional issues like security, hacking.
		CLO15	Understand active transactions and provide security from development hurdles

IX. COURSE LEARNING OUTCOMES(CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to	PO's Mapped	Strength of Mapping
BCSB22.01	CLO 1	Understand the concept of mobile computing in terms of knowledge.	PO 1	3
BCSB22.02	CLO 2	Analyze the frameworks and tools for Android development	PO 1, PO 2	3
BCSB22.03	CLO 3	Identify generic UI development android user.	PO 1, PO 2	3
BCSB22.04	CLO 4	Estimate the VUIs and mobile apps of development	PO 1, PO 2 & PO 4	2
BCSB22.05	CLO 5	Identify the state machine, correct communications model, android networking and web	PO 2,PO 3 PO 5	2
BCSB22.06	CLO 6	Explain about the synchronization and replication of mobile data	PO 2, PO 5	3
BCSB22.07	CLO 7	Understand the database issues of android applications	PO 1, PO 4	3
BCSB22.08	CLO 8	Classify the Android telephony notifications and alarms	PO 1, PO 4, PO 5	2
BCSB22.09	CLO 9	Develop the Android field service app for runtime environment	PO 4, PO 5	3
BCSB22.10	CLO 10	Understand and develop packaging and deploying	PO4, PO 5	3
BCSB22.11	CLO 11	Examine the performance best practices of applications	PO 3,PO 5	3
BCSB22.12	CLO 12	Apply the Android multimedia on additional issues	PO 5	3
BCSB22.13	CLO13	Differentiate the mobile agents and peer-to-peer architecture, Android multimedia	PO 2, PO5	3
BCSB22.14	CLO 14	List out the platforms and additional issues like security, hacking	PO 4,PO 5	2
BCSB22.15	CLO 15	Understand active transactions and provide security from development hurdles	PO 4, PO5	3

3 = High; 2 = Medium; 1 = Low

X. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES

Course Outcomes (COs)	Program Outcomes			
	PO1	PO2	PO4	PO5
CO 1	3	3		
CO 2	3	3	3	
CO 3	3		3	3
CO 4			3	3
CO 5				3

XI. MAPPING COURSE LEARNING OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES

Course Learning Outcomes (CLOs)	Program Outcomes			
	PO1	PO2	PO4	PO5
CLO 1	3	3		
CLO 2	3	3		
CLO 3	3	3		
CLO 4	3	2	3	
CLO 5		2		2
CLO 6	3			2
CLO 7	3		3	
CLO 8	2		3	
CLO 9			2	3
CLO 10			3	
CLO 11				3
CLO 12				3
CLO 13	2			3
CLO 14			3	
CLO 15				3

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

XII. ASSESSMENT METHODOLOGIES – DIRECT

CIE Exams	PO 1, PO 2 , PO4, PO5	SEE Exams	PO 1,PO 2 , PO4, PO5	Seminars and term paper
VIVA	-	Student Viva	-	Mini Project

XIII. ASSESSMENT METHODOLOGIES – INDIRECT

✔	Early Semester Feedback	✔	End Semester OBE Feedback
✘	Assessment of Mini Projects by Experts		

XIV. SYLLABUS

UNIT – I: INTRODUCTION TO MOBILE COMPUTING
Introduction: Introduction to Mobile Computing, Introduction to Android Development Environment, Factors in Developing Mobile Applications, Mobile Software Engineering, Frameworks and Tools, Generic UI Development Android User
UNIT – II: MOBILE COMPUTING -MORE ON UIS
More on UIs: VUIs and Mobile Apps, Text-to-Speech Techniques, Designing the Right UI, Multichannel and Multimodal UIs, . Storing and Retrieving Data, Synchronization and Replication of Mobile Data,Getting the Model Right, Android Storing and Retrieving Data, Working with a Content Provider.
UNIT – III: NETWORK AND THE WEB:STATE MACHINE
Communications via Network and the Web: State Machine, Correct Communications Model, Android Networking and Web, Telephony Deciding Scope of an App, Wireless Connectivity and Mobile Apps, Android Telephony Notifications and Alarms: Performance, Performance and Memory Management, Android Notifications and Alarms, Graphics, Performance and Multithreading, Graphics and UI Performance, Android Graphics
UNIT – IV: PUTTING IT ALL TOGETHER AND MULTIMEDIA
Putting It All Together : Packaging and Deploying, Performance Best Practices, Android Field Service App, Location Mobility and Location Based Services Android Multimedia: Mobile Agents and Peer-to-Peer Architecture, Android Multimedia
UNIT – V: PLATFORMS AND ADDITIONAL ISSUES ,SECURITY AND HACKING
Platforms and Additional Issues: Development Process, Architecture, Design, Technology Selection, Mobile App Development Hurdles, Testing, Security and Hacking , Active Transactions, More on Security, Hacking Android.
Text Books:
Wei-Meng Lee, "Beginning AndroidTM 4 Application Development", 2012 by John Wiley & Sons
References:
1.http://www.sctie.iitkgp.ernet.in/ 2.http://www.rkala.in/softcomputingvideos.php 3.http://www.sharbani.org/home2/soft-computing-1 4.http://www.myreaders.info/html/soft_computing.html
E-Text Books:
1. https://www.books.google.co.in/books?id=bVbj9nhvHd4C 2. https://www.books.google.co.in/books?id=GrZHPgAACAAJ&dq=1.+J.S.R.Jang,+C.T.Sun+and+E

XV. COURSE PLAN:

The course plan is meant as a guideline. Probably there may be changes.

Lecture No.	Topics to be covered	Course Learning Outcomes (CLO)	Reference
1-3	Introduction to mobile communications Introduction to Android Development Environment	Understand the basic concept of mobile computing	T1:1.1-1.8, T2:1.2
4-7	Factors in Developing Mobile Applications	Describe the GSM and GPRS architecture	T1:3.3-3.7 T2:2.3
8-9	Mobile Software Engineering	Discuss about the GSM services	T1:3.3 T2:2.3

10	Frameworks and Tools, Generic UI Development Android User	Explain about MAC layer	T1:4.1
11-12	More on UIs: VUIs and Mobile Apps, Text-to-Speech Techniques,	Discuss about MAC protocols	T1:4.1
13-14	Designing the Right UI, Multichannel and Multimodal UIs,	Generalize the Collision Avoidance protocols	T1:3.8,4.1 T2:2.5-3.1
15-17	Storing and Retrieving Data, Synchronization and Replication of Mobile Data,Getting the Model Righ	Demonstrate about themobile IP network Layer	T1:4.4
18-21	Getting the Model Right, Android Storing and Retrieving Data,	Describe about the Location management and registration	T1:4.5,4.6,4.7
22-24	Working with a Content Provider.	Explain about the mobile transport layer protocols	T1:4.9, 6.1
25-28	Communications via Network and the Web: State Machine, Correct Communications Model,	Summarize about the Mobile TCP	T1:5.2
29-32	Android Networking and Web,	Discuss about the database issues	T1:5.1.5.4
33-37	Telephony Deciding Scope of an App, Wireless Connectivity and Mobile Apps,	Explain about the transactional models	T1:8.1-8.6
38-41	Android Telephony Notifications and Alarms: Performance, Performance and Memory Management	Describe about the data dissemination and synchronization	T1:6.1-6.7
42-46	Android Notifications and Alarms, Graphics, Performance and Multithreading, Graphics and UI Performance, Android Graphics	Illustrate about the selective tuning and indexing methods	T1:7.6,7.7
47-51	Putting It All Together : Packaging and Deploying, Performance Best Practices	Interpret the MANETs and their applications	T1:10.1-10.5
52-55	Android Field Service App, Location Mobility and Location Based Services Android Multimedia: Mobile Agents and Peer-to-Peer Architecture, Android Multimedia	Discuss about the routing algorithms	T1:11.3
56-59	Platforms and Additional Issues: Development Process, Architecture,	Explain about the MANET services	T1:11.3
60-61	Design, Technology Selection, Mobile App Development Hurdles, Testing, Security and Hacking	Analyze about the protocols and platforms	T1:10.6-10.13
62-63	Active Transactions, More on Security, Hacking Android.	Understand various operating systems	T2:9.1

XIV. GAPS IN THE SYLLABUS - TO MEET INDUSTRY / PROFESSION REQUIREMENTS:

S No	Description	Proposed actions	Relevance with POs
1	Knowledge on Android application.	Seminars/NPTEL	PO 2, PO 4

Prepared by:
Ms. B Vijaya Durga, Assistant Professor

HOD, CSE