

COURSE CODE	COURSE TITLE	L	T	P	C
1152CS163	SMARTPHONE COMPUTING	3	0	0	3

Course Category: Program Elective

A. Preamble: The course aims at providing a sound conceptual foundation in the working principle of Smart phone which involves mobile communication, mobile hardware, and mobile software. The course attempts to provide the concept of localization, Mobile Sensing application and the importance of privacy and security in Smart phone. At the end of this course, students should be able to conceptualize, analyze and design of smart phone systems and Mobile cloud applications.

B. Prerequisite Courses:

Sl. No	Course Code	Course Name
1	1151CS111	Computer Networks
2	1151CS117	Java Programming

C. Related Courses:

Sl. No	Course Code	Course Name
1	1156CS701	Major Project

D. Course Outcomes:

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Illustrate the Smart phone system architecture and its characteristics	K2
CO2	Understand the various Mobile Programming Platforms.	K2
CO3	Interpret the Mobile System Localization.	K2
CO4	Analyze the various Context Aware and Mobile Sensing techniques in Smartphone.	K3
CO5	Design the various Mobile Cloud Application	K3

E. Correlation of COs with POs and PSOs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	M						M	M							
CO2	M	H	M					M						M	
CO3		H	M				M								
CO4	M	H	M	M											
CO5	M		H	H										M	H

H- High; M-Medium; L-Low

F. Course Content :

UNIT I Introduction 9

Mobile computing, Challenges in mobile computing, convergence of sensing, computing, and communications, Introduction to Smart phones Architecture, Overview of Mobility models, Augmenting Mobile 4G with WiFi, Vehicular WiFi Hotspots, Code Offload, Authentication on Mobile Phones, Activity based Password, Finger Taps usage as Fingerprints.

UNIT II Programming Platforms 9

Overview of different mobile programming environments, classical programming practices, Introduction to mobile operating systems: iOS, Android, Windows, Mobile application development. Wireless Energy Management: Measurement of energy consumption, WiFi Power Save Mode (PSM), Constant Awake Mode (CAM), Different Sleep States, WiFi Energy management.

UNIT III Localization 9

User location and tracking system, Cell tower localization, Spot localization, Logical location, Ambience fingerprinting, War-driving, Localization without war-driving, Indoor localization, Crowd sourcing for localization. Location Privacy: Different approaches, K-anonymity, CliqueCloak, Location Privacy, Applications with location proof.

UNIT IV Context Aware and Mobile Sensing 9

Context-Aware system, Context Aware Mobile Sensors, Automatic Image Tagging, Safety critical applications, Energy-efficient Context Sensing, Contextual Ads and Mobile Apps, Context aware security. Mobile Sensing: Machine Recognition of Human Activities, Mobile Phones to Write in Air, Personalized Gesture Recognition, Content Rating, Recognizing Human without Face Recognition, Intelligent transportation, crowd-sourcing applications, Phone-to-Phone Action Games, Interface design issues, Gesture-based Input.

UNIT V Mobile Cloud Computing 9

Mobile Cloud Computing, Mobile Cloud Service Models, Offloading Mobile Application to Cloud, Case Study: Mobile Commerce, Mobile-Cloud Social networking, Mobile-Cloud Healthcare.

TOTAL : 45 Periods

G. Learning Resources

i. Text Books:

1. PeiZheng, Lionel Ni, Morgan Kaufmann Series in Networking, Smart Phone and Next Generation Mobile Computing, Elsevier Science, First Edition, 2005.
2. Dijiang Huang Huijun Wu, Mobile Cloud Computing Foundation and Service Models, Elsevier Science, First Edition, 2017.

ii. References:

1. Prasant Kumar Pattnaik, Rajib Mall, “Fundamentals of Mobile Computing”, PHI Learning Pvt. Ltd, New Delhi – 2012.
2. Jochen H. Schller, “Mobile Communications”, Second Edition, Pearson Education, New Delhi, 2007.
3. Hansmann, LotharMerk, Martin Niclous, Stober, Principles of Mobile Computing, Springer second edition, 2006.

iii. Online Resources

1. Android Developers : <http://developer.android.com/index.html>.
2. Apple Developer : <https://developer.apple.com/>
3. Windows Phone Dev Center : <http://developer.windowsphone.com>

BlackBerry Developer : <http://developer.blackberry.com/>