COURSE CODE	COURSE TITLE	L	T	P	C
1152IT104	MOBILE AD HOC AND SENSOR NETWORKS	3	0	0	3

Course Category:

~~Foundation (0) / Program Core (1) /~~ **Program Elective (2)** ~~/ Allied Elective (3) / University Elective (4) / Value Education Elective (5) / Independent Learning (6) / Industry – Higher Learning Institute Interaction (7).~~

a. **Preamble**

It aims to provide technology-oriented students with the knowledge and ability to develop creative solutions, and better understand the effects of future developments of mobile applications and its technology.

b. Prerequisite Courses:

Mobile Communication

c. Related Courses:

Wireless Sensor network
MANET

d. Course Educational Objectives :

- Understand the basics of Ad-hoc & Sensor Networks.
- Learn various fundamental and emerging protocols of all layers.
- Analyze the issues pertaining to major obstacles in establishment and efficient management of Ad-hoc and sensor networks.
- Understand the nature and applications of Ad-hoc and sensor networks.
- Understand various security practices and protocols of Ad-hoc and Sensor Networks.

e. 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	Establish a Sensor network environment for different type of applications.	**K2**
CO2	Explain the concepts, network architectures and applications of ad hoc and wireless sensor networks	**K3**
CO3	Analyze the protocol design issues of ad hoc and sensor networks	**K3**
CO4	Design routing protocols for ad hoc and wireless sensor networks with respect to some protocol design issues	**K2**
CO5	Evaluate the QoS related performance measurements of ad hoc and sensor networks	**K3**

f. Correlation of COs with POs :

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**M**		**L**		**L**							
CO2	**M**		**L**		**M**							

CO3	**M**		**M**		**M**							
CO4	**M**				**M**							
CO5	**M**				**M**							

- H- High; M-Medium; L-Low

g. Course Content :

UNIT I : ADHOC SENSOR ROUTING : Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – Table Driven Routing Protocols- Multicast Routing – Tree based and Mesh based protocols – Multicast with Quality of Service Provision.

UNIT II QOS & Security : Real-time traffic support – Issues and challenges in providing QoS – Classification of QoS Solutions – MAC layer classifications – QoS Aware Routing Protocols – Ticket based and Predictive location based Qos Routing Protocols. Security in Ad Hoc Wireless Networks – Network Security Requirements – Issues and Challenges in Security Provisioning – Network Security Attacks

UNIT III ENERGY MANAGEMENT AD HOC NETWORKS : Need for Energy Management – Classification of Energy Management Schemes – Battery Management and Transmission Power Management Schemes – Network Layer and Data Link Layer Solutions – System power Management schemes

UNIT IV MESH NETWORKS : Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic Routing – Self Configuration and Auto Configuration - Capacity Models –Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

UNIT V SENSOR NETWORKS : Introduction – Sensor Network architecture – Data Dissemination – Data Gathering – MAC Protocols for sensor Networks – Location discovery – Quality of Sensor Networks – Evolving Standards – Other Issues – Recent trends in Infrastructure less Networks

h. Learning Resources

i. TEXT BOOK:

1. C. Siva Ram Murthy and B.S.Manoj, “Ad hoc Wireless Networks – Architectures and Protocols’, Pearson Education, 2008

ii. REFERENCES

1. Feng Zhao and Leonidas Guibas, “Wireless Sensor Networks”, Morgan Kaufman Publishers, 2004.
2. C.K.Toh, “Adhoc Mobile Wireless Networks”, Pearson Education, 2002.
3. Thomas Krag and Sebastin Buettrich, ‘Wireless Mesh Networking’, O’Reilly Publishers, 2007.

iii. Online Resources

1. http://en.wikipedia.org/wiki/Mobile_ad_hoc_network
2. http://research.ac.upc.edu/CompNet/qos_adhoc.htm
3. http://www.cse.wustl.edu/~jain/cse574-06/ftp/j_gema.pdf
4. http://en.wikipedia.org/wiki/Mesh_networking