COURSE CODE	COURSE TITLE	L	T	P	C
1152CS168	WIRELESS BODY AREA NETWORKS	3	0	0	3

Course Category: Program Elective

A. Preamble:

The main purpose of this course is to provide in-depth knowledge of wireless body area networks and antenna system.

B. Prerequisite Courses:

Sl. No	Course Code	Course Name
1	1151CS111	Computer Networks

C. Related Courses:

Sl. No	Course Code	Course Name
1	1156CS601	Minor Project
2	1156CS701	Major Project

D. Course Outcomes:

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

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain about the basic supporting system for wireless body area networks	K2
CO2	Discuss about Network and Medium Access Control Protocol design for WBAN.	K2
CO3	Explain about Power Management in Body Area Networks for Health Care.	K2
CO4	Discuss about the applications of WBAN.	K2
CO5	Explain about Wearable Systems.	K2

E. Correlation of COs with POs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	M														
CO2	M	L													L
CO3	M	L	L		L						L				L
CO4	M	L	L		L						L				L
CO5	M	L									L				L

H- Strong; M-Medium; L-Low

F. Course Content:

UNIT I: Supporting System for WBAN 9

Wireless body sensors-Sensor nodes and hardware designs-Wireless systems and platforms-Wireless transceivers and microcontrollers-Existing sensor boards-Design of implanted sensor nodes for WBAN-WBAN Systems-Software programs and monitoring.

UNIT II: Network and Medium Access Control Protocol Design for WBAN 9

Network topologies and configuration-Basics of MAC protocol-Traffic characteristics - Scheduled protocol- Random access protocol-Hybrid MAC protocol - Energy management in WBAN- Patient Monitoring Network Design - Performance analysis of WBAN.

UNIT III: Power Management in Body Area Networks for Health Care

The Case for Transmit Power Control in Body Area Networks: Normal Walk, Slow Walk, Resting, Optimal Off-Line Transmit Power Control, Practical On-Line Transmit Power Control: A Simple and Flexible Class of Schemes, Example Adaptations of the General Scheme, Tuning the Parameters.

UNIT IV: Applications of WBAN 9

Monitoring patients with chronic disease, Hospital patients, Elderly patients, Cardiac arrhymias monitoring, Multi patient monitoring systems, Multichannel Neural recording, Gait analysis, SportsMedicine, Electronic pill.

UNIT V: Wearable Systems 9

Need for Wearable Systems, Applications of Wearable Systems, Recent developments – Global and Indian Scenario, Types of Wearable Systems, Components of wearable Systems, Physiological Parameters commonly monitored in wearable applications, Smart textiles, & textiles sensors, Wearable Systems for Disaster management.

TOTAL: 45

Learning Resources

i.Text Books:

1. Huan-Bang Li, KamyaYekehYazdandoost Bin-Zhen, “Wireless Body Area Networks”,River Publishers, 2010.
2. Mehmet R. Yuce, Jamil Y.Khan, “Wireless Body Area Networks Technology, Implementation, and Applications”, Pan Stanford Publishing Pte.Ltd, Singapore, 2012.
3. Annalisa Bonfiglio, Danilo De Rossi ,"Wearable Monitoring Systems", Springer, 2011.

ii.Reference Books:

1. Terrance J. Dishongh and Michael Mcgrath, “Wireless Sensor Networks for Healthcare Applications”, Artech House; First edition, October 30, 2009, ISBN – 978- 1596933057.
2. Guang-Zhong Yang (Editor), and M. Yacoub (Foreword), “Body Sensor Networks”, Springer; First Edition, March 28, 2006, ISBN-13: 978- 1846282720.
3. Huan-Bang Li, KamyaYekehYazdandoost, and Bin Zhen, “Wireless Body Area Network”, River Publishers’ Series in Information Science and Technology, Oct 29, 2010, ISBN : 978-87-92329-46-2.