

COURSE CODE	COURSE TITLE	L	T	P	C
1152CS166	WIRELESS SENSOR NETWORKS	3	0	0	3

Course Category: Program Elective

A. Preamble :

This course is to provide students with a constructive overview of the concepts of wireless sensor networks with its standards and its protocols to design and create models for real world applications.

B. Prerequisite Courses:

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

C. Related Courses:

Sl. No	Course Code	Course Name
1	1152CS209	Internet of Things

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	Learn the fundamentals and architecture of wireless sensor networks.	K2
CO2	Understand the several protocols used in WSN for data disseminating and data gathering.	K2
CO3	Study the various types of algorithms and methods for data aggregation.	K2
CO4	Understand the agriculture applications constructing a system or model for agriculture productivity.	K2
CO5	Explain the industrial applications for constructing design a system or model for industrial monitoring and control.	K2

E. Correlation of COs with POs :

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

H- High; M-Medium; L-Low

F. Course Content :

UNIT I Introduction to WSN 9

Overview of WSN, Technological background, Network architecture, Classification of WSN, Protocols stack for WSN, Fundamental MAC protocols.

UNIT II Routing, Data Dissemination and Data Gathering 9

Fundamentals and Challenges, Taxonomy of routing and Protocols, Location aided protocols, Data gathering protocols, Data centric protocols and Multipath – based protocols.

UNIT III Data Aggregation and Energy Issues 9

Introduction, Node clustering algorithm for WSN, Query processing in WSN, Data aggregation in WSN, Need of energy efficiency and Power control in WSN and Future directions.

UNIT IV Agricultural WSN 9

Introduction, Potential applications, Design of WSN for agriculture applications, Technological and standards, Existing Real-world applications, Future challenges and Issues.

UNIT V Industrial WSN 9

Introduction to IoT and IIoT, Challenges and Issues, IIoT Technologies and its standards, IIoT protocols, Security and privacy in IIoT, Future directions.

TOTAL: 45

G. Learning Resources

i. Text Books

1. Jun Zheng and Abbas Jamalipour, —Wireless Sensor Networks: A Networking Perspective”, 1st Edition, A John Wiley & Sons, Inc., Pub. 2009.
2. Tamoghna Ojha, Sudip Misra, Narendra Singh Raghuwanshi, “Wireless sensor networks for agriculture: The state-of-the-art in practice”, Computers and Electronics in Agriculture, Science Direct, 2015.
3. Ramakrishna Budampati and Soumitri Kolavennu, “Industrial Wireless Sensor Networks Monitoring, Control and Automation”, Woodhead Publishing Series in Electronic and Optical Materials, 2015.

ii. References

1. Dr. Kazem Sohraby, Daniel Minoli, Taieb Znati, Wireless Sensor Networks: Technology, Protocols, and Applications, John Wiley & Sons, Inc., 2007.
2. Ian F. Akyildiz and Mehmet Can Vuran, Wireless Sensor Networks, A John Wiley and Sons, Ltd, Publication, 2010.

iii. Online Resources

1. <https://www.sciencedirect.com/book/9781782422303/industrial-wireless-sensor-networks#book-info>.
2. <http://www.tfb.edu.mk/amarkoski/WSN/Kniga-w02>.
[http://doktora.kirbas.com/Kitaplar/Wireless%20Sensor%20Networks%20\(Akyildiz\).pdf](http://doktora.kirbas.com/Kitaplar/Wireless%20Sensor%20Networks%20(Akyildiz).pdf)