

**CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF COMPUTER SCIENCE
M.Sc. COMPUTER SCIENCE**

ELECTIVE COURSE					
COURSE CODE	COURSE TITLE	CONTACT HRS/WEEK			CREDITS
		LEC	LAB	TUT	
CSC5003	Wireless Sensor Networks	2	2	1	4

Lec = Lecture, Tut = Tutorial, Lab = Practical

This is a participatory, experimental and **skill based course**.

Course Objective:

The objective of the course is to provide theoretical and practical aspects of wireless sensor networks.

By completing this course, students will obtain the following course/learning outcomes:

1. Knowledge gained:
 - (i) State of art methods, challenges, architecture and applications of wireless sensor networks.
2. Skill gained:
 - (ii) Skills in modelling wireless sensor application using Network Simulator and NetSim
 - (iii) Skills in designing and performance analysis of various protocols for wireless sensor networks
3. Competency gained:
 - (iv) Implementation and simulation of wireless sensor networks for various applications.

Prerequisites: Basic knowledge in computer networks

Grading:

Lab implementation	– 20%
Participatory based group Project	– 10%
Assignment/Quiz/presentation	– 5%
Class Test	– 5%
Final Exam	– 60%

CSC5003 – Wireless Sensor Networks

Module 1

Introduction and basic overview of wireless sensor network, Challenges and hurdles, Basic sensor network architectural elements, Sensor node technology, Available wireless technologies. Range of applications, Examples of category 1 WSN applications and Examples of category 2 WSN applications.

Module 2

Introduction of Medium access control protocols for wireless sensor networks, Fundamentals of MAC protocols, MAC protocol for WSNs, Sensor MAC case study, IEEE 802.15.4 LR-WPANs standard case study. Introduction of routing protocols, Data dissemination and gathering, Routing challenges and design issues in wireless sensor networks, Routing strategies in wireless sensor networks, Geographical routing.

Module 3

Traditional transport control protocol for WSN, Transport protocol design issues, Examples of existing transport control protocols, Performance of transport control protocols. Network management requirements for WSN, Traditional network management models, Network management design issues.

Module 4

Sensor network Platform, Tools and Operating Systems for WSN: Sensor node hardware, Sensor network programming challenges, Node-level software platforms, Operating system design issues, Examples of operating systems. Performance and Traffic management: Introduction, WSN design issues, Performance modeling of WSNs, Case study: Simple computation of the system life span.

Text books:

1. Kazem Sohraby, Daniel Minoli, Taieb F. Znati, *Wireless Sensor Networks: technology, protocols and application*, Wiley, 2015.
2. Feng Zhao and Leonidas Guibas, *Wireless Sensor Networks*, Morgan Kaufmann, San Francisco, 2004.

Reference books:

3. H. Karl, A. Willing, *Protocols and Architectures for Wireless Sensor Networks*, Wiley, 2017.
4. A. Swami, Q. Zhao, Y.-W. Hong, L. Tong, *Wireless Sensor Networks: Signal Processing and Communication Perspectives*, Wiley, 2007.