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***CSX458 Wireless Sensor Networks***

**L-T-P-Cr: 3-0-0-3**

**Pre-requisites:** Fundamentals of Mobile Communication, Computer networks.

**Objectives:**

* To understand basic concepts of wireless sensor networks.
* To learn about the MAC and Routing protocols.
* To understand the middleware architecture and network management models for WSN.

**Course Outcomes:**

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| **S. No** | **Outcome** | **Mapping to PO** |
| CO-1 | Understand the WSN concepts, challenges and applications | PO4 |
| CO-2 | Learn the hardware and software components and the operating environment | PO2, PO3 |
| CO-3 | Learn the MAC protocols and Routing protocols used in WSN along with challenges and design issues | PO2, PO3, PO4 |
| CO-4 | Acquaint with the Transport Control Protocols | PO2, PO4 |
| CO-5 | Learn the Middleware architecture & Network Management for WSN | PO2, PO3, PO6 |

**Course Contents:**

**Unit-I: Lectures: 3**

Introduction: Introduction to Wireless Sensor Network (WSN), Sensor Network Architectural Elements, Challenges and Hurdles, Applications of WSN.

**Unit-II: Lectures: 6**

Sensor and Transmission Technology: Sensor Node Technology, Operating System design issues for Sensor Node, Radio Technology Primer.

**Unit-III: Lectures: 15**  
Communication Protocols: MAC Protocols: Fundamentals of MAC Protocols, MAC Protocols for WSN, Routing Protocols: Data Dissemination and Gathering, Routing Challenges and Design Issues, Routing Strategies in WSN.

**Unit-IV: Lectures: 6**  
Transport Control Protocols: Traditional Transport Control Protocols, Design Issues in Transport Protocols.

**Unit V: Lectures: 5**

Middleware for WSN: WSN Middleware Principles, Middleware Architecture.

**Unit VI: Lectures: 7**

Network Management for WSN: Network Management Requirements, Traditional Network Management Models, Network Management Design Issues.

**Text Books:**

1. Kazem, Sohraby, Daniel Minoli, Taieb Zanti, “Wireless Sensor Network: Technology, Protocols and Application”, John Wiley and Sons 1st Ed., 2007 (ISBN: 978-0-471-74300-2).

**Reference Books:**

1. Holger Karl, Andreas Willig, “Protocols and Architectures for Wireless Sensor Network”, John Wiley and Sons, 2005 (ISBN: 978-0-470-09511-9).
2. Raghavendra, Cauligi S, Sivalingam, Krishna M., Zanti Taieb, “Wireless Sensor Network”, Springer 1st Ed. 2004 (ISBN: 978-4020-7883-5).
3. Feng Zhao, Leonidas Guibas, “Wireless Sensor Network”, Elsevier, 1st Ed. 2004 (ISBN: 13- 978- 1-55860-914-3).
4. B. Krishnamachari, “Networking Wireless Sensors”, Cambridge University Press.
5. N. P. Mahalik, “Sensor Networks and Configuration: Fundamentals, Standards, Platforms, and Applications” Springer Verlag.