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|---|--|---------------------------|--------------------------------------|---|---|---|
| <b>Course Number</b>  | <b>CS 441</b>  | <b>Course Title</b>       | <b>Mobile and Wireless Computing</b> |   |   |   |
| <b>Semester Hours</b>   | <b>3</b>   | <b>Course Coordinator</b> | <b>Koushik Sinha</b>                 |   |   |   |
|   |  | SP20                      |                                      |   |   |   |
| <b>Catalog Description</b>  | <p>Concepts of mobile and wireless systems are presented. These concepts include, but are not limited to, Routing and Medium Access for Mobile Ad hoc and Wireless Sensor Networks, Mobile IP, Wireless LAN and IEEE 802.11. Hands-on group lab experience is an integral component in the course.</p> |                           |                                      |   |   |   |
| <b>Textbooks</b>  |  |                           |                                      |   |   |   |
| SP20  |  |                           |                                      |   |   |   |
| <p>Sinha, K., Ghosh, S.C., &amp; Sinha, B. P. (2015). <i>Wireless Networks and Mobile Computing</i>. CRC Press. ISBN: 9781482227932.</p>  |  |                           |                                      |   |   |   |
| <b>References</b>   |  |                           |                                      |   |   |   |
| <b>Course Learning Outcomes</b>   |  |                           |                                      |   |   |   |
| <ul style="list-style-type: none"> <li>• Understand the characteristics and challenges of wireless communication and radio propagation.</li> <li>• To learn various routing and media access protocols specifically designed for mobile and wireless networks.</li> <li>• To learn to design and implement wireless communication protocols using real-life sensors and/or simulation tools.</li> </ul> |  |                           |                                      |   |   |   |
| <b>Assessment of the Contribution to Student Outcomes</b>   |  |                           |                                      |   |   |   |
| SP20  |  |                           |                                      |   |   |   |
| <b>Outcome →</b>  | 1  | 2                         | 3                                    | 4 | 5 | 6 |
| <b>Assessed →</b>   | X  | X                         | X                                    |   | X | X |
| <b>Prerequisites by Topic</b>   |  |                           |                                      |   |   |   |
| <p>CS 330 with a grade of <i>C</i> or better or graduate standing, or consent of the instructor.</p>  |  |                           |                                      |   |   |   |

**Major Topics Covered in the Course**

1. Introduction: review of OSI layering, networking basics {3 classes}
2. Review of TCP/IP physical layer (signals), data link layer (MAC protocols), and network layer (routing protocols) {4 classes}
3. Basics of wireless communications: radio propagation, antennas, fading, spread spectrum {3 classes}
4. MAC protocols for wireless networks: hidden & exposed terminal problems, MACA, MACAW {3 classes}
5. Wireless LAN, IEEE 802.11 {3 classes}
6. Mobile IP {3 classes}
7. Routing protocols for Mobile Ad-hoc Networks, DSR, AODV, TORA, DSDV, Multicasting, QoS routing {6 classes}
8. Overview of sensor networks, tiny OS {3 classes}
9. MAC protocols for sensor networks {3 classes}
10. Hands-On labs with motes {3 classes}
11. Hands routing protocols for sensor networks, data centric protocols, hierarchical protocols, and location-based protocols {6 classes}