# EECE 447 Routing and Switching

| | |
|---|---|
| **Course Number Course Name** | EECE 447 Routing and Switching |
| **Credit Value (Breakdown of theory and lab credits)** | (3,2T+1S) |
| **Catalog Course Description** | You will learn how to connect computers in a network and how to connect the separate networks together to form an inter-network, through examination and implementation of bridging, switching concepts, and routing protocols and algorithms. |
| **Student Learning Outcomes/Objectives /Competencies of the Course** | 1- This course will review the fundamental of packet routing and switching at: layer 2, MAC level; layer 3, routing level; and layer 5, application level. The course will also overview new technologies such as WMNs, and the routing and switching procedures in those networks at layer 2.5. <br> 2- MAC level: the student will: i) learn how packet switching in multi-access channel networks such as 802.3 and 802.11 is performed; ii) learn how support protocols (e.g., ARP, RARP) work; iii) develop and test support protocols. <br> 3- Routing level: the student will: i) understand the Internet addressing (IP), the main routing algorithms used in Internet, namely, Dijkstra algorithm, Bellman-Ford algorithm, multi-commodity linear programming for throughput optimization, and the principal routing metrics such as hop-count and delay; ii) learn the main protocols used for intra and inter domain, OSPF, RIP, MPLS, and BGP; iii) implement and configure a intra-domain IP network. <br> 4- WMN routing: the student will adapt well-known technologies such as linear programming and Dijkstra's algorithm to an emerging, cutting edge technology as WMN. He/she will i) understand the main differences between routing in wireless and wired networks; ii) learn suitable routing metrics for wireless networks, such as Expected Transmission Time (ETX) and Weighted Cumulative Expected Transmission Time (WCETT); iii) deploy a multi-radio multi-channel WMN and test its performance under different routing metrics. <br> 5- Application level: the student will: i) learn the fundamental of overlay networks and main protocols for signaling (routing) and media transport at layer 5, namely, SIP and Real Time Protocol (RTP); ii) will deploy a SIP network to provide real-time services, and develop routing policies to get a workable system able to interconnect to any other SIP network deployed in the world. |
| **College-Wide Student Learning Outcomes** | EECE 447 learning objectives align with the following NNMC College Wide Goals: <br> 1. Critical Thought |