ECE4605 Course Syllabus

ECE4605

Advanced Internetworking (3-0-3-4)

CMPE Degree
    This course is Elective for the CMPE degree.

EE Degree
    This course is Elective for the EE degree.

Lab Hours
    0 supervised lab hours and 3 unsupervised lab hours

Prerequisites
    ECE 3076*/3600* * Prerequisites indicated with an asterisk may be taken concurrently with ECE4605

Corequisites
    None

Catalog Description
    Reviews on networking fundamentals. Latest networking technologies in wireless and wireline networks. Machine learning and data science in networks or other emerging topics. Projects included.

Textbook(s)
    Kurose & Ross, *Computer Networking: A Top Down Approach Featuring the Internet* (7th edition), Addison Wesley, 2016. ISBN 9780133594140 (required)

Course Outcomes
    Upon successful completion of this course, students should be able to:
1. Develop a case study under an emerging network technology,
2. Demonstrate how the protocol or algorithms work,
3. Apply analytical fundamentals to construct network-level performance measures,
4. Develop an experimental setting (e.g., collecting and analyzing data).

Student Outcomes
    In the parentheses for each Student Outcome:
"P" for primary indicates the outcome is a major focus of the entire course.
"M" for moderate indicates the outcome is the focus of at least one component of the course, but not majority of course material.
"LN" for "little to none" indicates that the course does not contribute significantly to this outcome.
1. (P) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. (LN) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. (LN) An ability to communicate effectively with a range of audiences

4. (LN) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. (LN) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. (M) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. (M) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topical Outline

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Review
-Communication Networks, layering model, performance
-TCP, IP, MAC protocols
--Future network architecture
Network QoS
-MPLS
-Network Function Virtualization
-Software Defined Networking
Wireless Networks:
-MAC
-MAC/Network
-Transport
-Future (5G) wireless network architecture and protocols*
Internet of Things (IoT)
-Introduction*
-Fog computing/networking*
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