New Jersey's Science & Technology University

NEWARK COLLEGE OF ENGINEERING

New Jersey Institute of Technology
University Heights
Newark, NJ 07102-1982

Department of Engineering Technology
GITC Building Suite 2100
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SYLLABUS AND COURSE INFORMATION

Course Name: Design of Internet Based Embedded Systems

Course Number: ECET 419

Course Structure: 2-2-3 (lecture hr/wk – lab hr/wk – course credits)

Course Description: This course explores the fundamental technologies required to build modern embedded systems that are utilized and controlled over the internet. Students learn the basics of foundational internet technologies and data structures such as IoT basics, HTTP requests and response methods, REST web service structures, client/server model topologies, JSON data representation, apache web server, HTTP / IP routing basics, PHP, MySQL, and linux basics. The course explores combinations of these technologies to form complete client/server communication systems that are specifically design for control and utilization of embedded systems using web based communication. The course concludes with a final project where students design an internet based embedded system that can be controlled, monitored, and utilized over the internet.

Prerequisites: ECET 411 and Junior or Senior Standing

Corequisites: None

Required, Elective, or Selected Elective: Selected Elective

Required Materials: Electronic course materials provided by the instructor.

Course Outcomes: By the end of the course students are able to:

1. Identify and understand the standard mechanisms for transactional data flow to internet-based systems such as sensors and controllers.
2. Understand standard methods of data encoding for internet based systems, such as JSON, XML, etc...
3. Understand the fundamental concepts and features of web services that utilize standard HTTP request methods.
4. Understand the state-of-the-art as it related to internet based systems control including modern control topologies and standards.
5. Understand the basics of IP routing for the purpose of understanding what information is needed to direct messages to and receive messages from a target device on the internet.
6. Understand the role of servers and databases in the structure of internet based embedded systems.
7. Demonstrate familiarity with the relevant technologies for internet based control of systems through a practical project.

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Class Topics:	Web Services	IoT
	Servers	Data Encoding
	Embedded Systems	Internet Communication
	IP Routing	Databases

Academic Integrity: NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. Please visit the Dean of Students website at http://www.njit.edu/doss for a list of student policies relating to academic integrity and student conduct.

Modification to Course: The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

Prepared By: Daniel Brateris

Course Coordinator: Daniel Brateris

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