

1. Course Number and Course Title:

COE 633- Advanced Internet Computing and Internet of Things

2. Credits Hours:

3-0-3

3. Prerequisites and/or Co-Requisites:

Prerequisite: Approval of the CSE Head of Department

Co-requisites: None

Competencies : Basic knowledge of internet programming

4. Name and Contact Information of Instructor:

Dr. Imran Zualkernan

5. Course Description (Catalog Description):

Covers advanced topics in Internet computing and Internet of Things (IoT) including client-side and web-server technologies, internet-specific big data technologies, edge analytics and resource off-loading, middleware, IoT architectures and IoT applications of deep learning.

6. Textbook and other Supplemental Material:

Primary: Readings will change from semester to semester.

7. Learning Outcomes:

Upon completion of the course, students will be able to:

1. Evaluate alternative IoT Architectures and related Security issues
2. Investigate issues in use of low-power sensors and edge analytics for IoT
3. Analyze design trade-offs in client-side interfaces for web, mobile and wearables
4. Analyze the design of various types of middleware for IoT architectures
5. Compare the utility of big data systems for IoT applications
6. Evaluate resource-offloading techniques and Fog computing in the context of IoT applications
7. Evaluate techniques for using AI and Deep Learning for IoT applications
8. Analyze domains of applications for IoT applications

8. Teaching and Learning Methodologies:

Methods include lectures; problem and project-based learning methods (homework, simulation-based projects) and class discussions.

9. Course Topics and Schedule:

Topic	Week
Introduction to IoT Architectures	Week #1
Edge Analytics	Week #2
Edge Analytics	Week #3
Unique aspects of client-side interfaces for IoT	Week #4
Unique aspects of client-side interfaces for IoT	Week #5
Middleware architectures for IoT	Week #6
Middleware architectures for IoT	Week #7
Big Data systems for IoT	Week #8
Big Data systems for IoT	Week #9
Resource offloading and Fog Computing	Week #10
Resource offloading and Fog Computing	Week #11
AI and Deep learning for IoT	Week #12
AI and Deep learning for IoT	Week #13
Application Domains for IoT	Week #14

Review and evaluation, class presentations	Week #15
Final Exam	Week #16