Level 8

- ### CSI 421   Distributed Systems & Parallel Processing

The objective of this course is to introduce students to the fundamentals and techniques of distributed computing and provide them with the basic skills of how to write distributed programs. Topics to be covered include: distributed computing, distributed programming, distributed systems, concurrency, distributed computing paradigms, inter-process communications, group communications, operating system support, distributed objects, application programming interfaces (RMI, RPC), client server model, the socket API, security issues and Internet applications. In this course also, student will study an introduction to parallel processing. Models of parallel machines. Parallel programming paradigms and models. Performance analysis of parallel systems. Parallel programming languages and frameworks. Students are expected to develop distributed applications using latest technologies.

- ### CSI 422   Software Engineering 2

This course covers the main concepts of object-oriented software engineering concepts. Topics include: object-oriented software processes: Agile process models, process activities, the Rational Unified Process, Computer-Aided Software Engineering. System Models: Context models, Behavioural models, Data models, Object models, CASE workbenches. Object Oriented Concepts: Object approach. Unified Modelling Language (UML): Class Diagram, Object Diagram, Use Case Diagram, Collaboration Diagram, Sequence Diagram, Component Diagram, and Deployment Diagram. Rapid application development and CASE tools for object-oriented systems – Object-oriented systems testing, operation and maintenance.

- ### CSI423   Cryptography and Information Security

The aim of this course is to facilitate understanding of the inherent strengths and limitations of cryptography, especially when used as a tool for information security. Armed with this knowledge, student should be able to make more informed decisions when building secure systems. The course covers various aspects of symmetric and asymmetric cryptography. While some topics will be dealt with in more detail, the course will attempt to provide a broad coverage of possibly all the core areas of cryptography. The students will be expected to implement and analysis some simple cryptographic schemes and read various articles. To understand the principles of encryption algorithms; conventional and public key cryptography. To have a detailed knowledge about authentication, hash functions and application level security mechanisms. Topics include: Overview - Encryption Techniques - Block ciphers and DES - Review of Mathematical concepts - Finite Fields. Advanced Encryption Standard - Block cipher operation - Public key Cryptography and RSA - Other public key cryptosystem - Hash functions: Applications of Cryptographic hash functions, simple hash functions, SHA-3, Digital signatures.

- ### CSI 449 Geographic Information Systems

Fundamental Geographic Information Systems concepts to create, edit, and query spatial data. - An introduction to map projections, coordinate systems, data capture, attribute tables - Data manipulation, remote sensing, aerial and satellite imagery and using Global Position Systems (GPS) - Transferring data to GIS data models - Spatial relationships analysis and making decisions from presented information through various geo-processing techniques - Applications of GIS in many fields - Development of GIS systems.

- **CSI 425   Computer Graphics**

Computer Graphics I is a study of the hardware and software principles of interactive raster graphics. Topics include an introduction to the basic concepts, 2-D and 3-D modelling and transformations, viewing transformations, projections, rendering techniques, graphical software packages and graphics systems. Students will use a standard computer graphics API to reinforce concepts and study fundamental computer graphics algorithms.