

CE4013 and CZ4013 – Distributed Systems

Academic Year	AY1819	Semester	2
Course Code	CE/CZ4013		
Course Title	Distributed Systems		
Pre-requisites	CE/CZ2005 Operating System; CE3005 Computer Networks OR CZ3006 Net-Centric Computing		
Pre-requisite for	NIL		
No of AUs	3		
Contact Hours	Lectures	26	TEL 0 Tutorials 13

Course Aims

This course aims to develop your understanding of the basic architectures, algorithms and design principles of distributed computing systems, and how they meet the demands of contemporary distributed applications.

This course provides an introductory but broad perspective of distributed systems, and is relevant for anyone pursuing a career in the IT/ICT industry – including those in product design and development, network/system administration, as well as, given the proliferation of IT in all walks of our lives, in executive roles across industries and government.

Intended Learning Outcomes (ILO)

This course introduces distributed systems at an elementary level. Upon the successful completion of this course, you shall be able to:

1. Explain the fundamental concepts and main features of distributed systems.
2. Describe the architectures of distributed systems.
3. Describe the functions of software components and common services to support distributed applications.
4. Analyse and apply the basic distributed algorithms.
5. Apply key design principles to an implementation of distributed system.

CE4021 and CZ4021 – Pervasive Networks

Academic Year	AY1819	Semester			2			
Course Code	CE/CZ4021							
Course Title	Pervasive Networks							
Pre-requisites	CE3005 Computer Networks OR CZ3006 Net-Centric Computing							
Pre-requisite for	NIL							
No of AUs	3							
Contact Hours	Lectures	13	TEL	13	Tutorials	10		

Course Aims

The objective of this course is to introduce you to different types of wireless network technologies and some important mobile services and applications to support pervasive computing. The subject consists of two complementary components, i.e., wireless network protocol and mobility management. In the wireless network protocol part, various protocols in different layers designed to support wireless data transfer will be presented. In the mobility management, the required mechanisms to support data transfer with users' mobility will be discussed. After attending this course, you should be able to address the various technical challenges associated with wireless networking by solving such challenges using the principles learned. In addition, you should be able to solve issues related to location management, and mobile multimedia services. The concepts covered in this course are particularly important for those working in fields such as mobile phone-related services, wireless apps development and location-based services.

Intended Learning Outcomes (ILO)

Upon the successful completion of this course, you should be able to:

1. Design protocols for different network environments by applying concepts of different wireless technologies in pervasive networks
2. Solve handover problems in cellular mobile environments
3. Conduct performance analysis of the pervasive networks using hexagonal coordinate system and calculus-based mathematical models

CE4022 and CZ4022 – Personal Mobile Networks

Academic Year	AY1819	Semester	1
Course Code	CE/CZ4022		
Course Title	Personal Mobile Networks		
Pre-requisites	CE3005 Computer Networks OR CZ3006 Net-Centric Computing		
Pre-requisite for	NIL		
No of AUs	3		
Contact Hours	Lectures	26	TEL - Tutorials 13 Laboratories -

Course Aims

This course builds upon the foundation network knowledge gained from core courses on Computer Networks (CE3005) or Net-Centric Computing (CZ3006). It aims to introduce both Computer Engineering and Computer Science students to the realm of mobile communications made possible through wireless technologies. It provides a straightforward and broad survey of wireless voice and data network standards and technologies available today for personal communications. It is designed for those of you taking an entry-level wireless technology course or seeking better knowledge of wireless communications and networks. The topics include the technologies being exploited in Bluetooth to Wi-Fi to cell phones to satellite communications. Wireless mobile communication systems including wireless personal networks (WPAN), wireless local area networks (WLAN), wireless wide area networks (WWAN) would also be introduced. This course will complement CE/CZ4021 Pervasive Networks.

Intended Learning Outcomes (ILO)

By the end of this course, the student would be able to:

1. Describe, explain and evaluate the fundamental components and technologies of wireless mobile communication systems.
2. Describe, explain, discuss and analyse the requirements of, as well as issues and challenges on mobile communication systems.
3. Describe, explain, discuss and analyse the effects of mobility on the communication system and how the impacts and impairments can be alleviated and resolved.
4. Factor, analyse and evaluate the various issues, techniques and technologies in the design and development of mobile applications and communication networks.

CE4023 and CZ4023 – Advanced Computer Networks

Academic Year	AY1819	Semester			1			
Course Code	CE/CZ4023							
Course Title	Advanced Computer Networks							
Pre-requisites	CE3005 Computer Networks OR CZ3006 Net-Centric Computing							
Pre-requisite for	NIL							
No of AUs	3							
Contact Hours	Lectures	26	TEL	0	Tutorials	10	Example class	0

Course Aims

Building upon earlier courses (CE3005 or CZ3006), this subject aims to bring you into the realm of real inter-networking. The subject consists of two complementary components. On one hand, several application layer protocols are to be explained, along with their requirements on the underlying networks. On the other hand, practical network design and management methodologies will be introduced; they aim at meeting the application requirements. Emphasis is mostly placed on the practical use and construction of networks, with a bias toward multimedia applications. Advanced materials, such as, peer-to-peer networking will also be covered to prepare you well for your future career in advanced computer networks.

Intended Learning Outcomes (ILO)

Upon the successful completion of this course, you shall be able to:

1. Identify and explain several application layer protocols and what they may demand from the underlying networks.
2. Identify and explain networks design and management to satisfy various application requirements
3. Conduct quick protocol performance analysis and making critical design decisions
4. Design a network to support a given set of requirements

CE4024 and CZ4024 – Cryptography and Network Security

Academic Year	AY1819	Semester			2			
Course Code	CE/CZ4024							
Course Title	Cryptography and Network Security							
Pre-requisites	CE3005 Computer Networks OR CZ3006 Net Centric Computing							
Pre-requisite for	NIL							
No of AUs	3							
Contact Hours	Lectures	26	TEL	-	Tutorials	13	Lab	-

Course Aims

This course aims to develop your ability to understand how basic cryptographic algorithms work and identify the problems associated with the application of cryptography in real-world security systems, and explain the pros and cons of various cryptographic mechanisms.

This course provides an introduction to basic cryptographic algorithms, along with the underlying mathematical foundations guiding the design of aid algorithms, and explores the usage of these primitives in real world applications, particularly applied to network security.

Intended Learning Outcomes (ILO)

This course provides an understanding of cryptography and network security at an introductory level. Upon the successful completion of this course, you shall be able to:

1. Apply the theoretical (mathematical) tools that form the basis of cryptographic algorithms;
2. Explain and analyze the design of cryptographic algorithms;
3. Identify the typical problems associated with the application of cryptography in real-world systems;
4. Explain the security issues in a Cyberspace environment;
5. Explain the design decisions behind a secure network architecture plan;
6. Design basic secure network strategy based on a combination of cryptographic and network security control mechanisms