Program	Level	First cycle
	Name of the program	Theoretical Computer Science

COURSE				
Course title	**Network Programming**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
CS 335	V	Elective course	5	2+0+2
Lecturer				
Course Goals	This course aims to enable the students to understand basic concepts in network programming and implement appropriate network applications using network protocols, sockets, threads, servers, clients, services, data encryption and other appropriate technologies.			
Learning Outcomes	By the end of this course, students will be able to design and implement network server-client applications for mutual communication between multiple hosts.			

COURSE CONTENT

- An Introduction to networks, packages, and protocols.
- The basics of sockets, IPv4 addresses, clients, and servers.
- The implementation of the client-server application by using TCP or UDP sockets. Input-output operations in the .NET environment. UDP Client/Server and TCP/IP client/server are implemented.
- The synchronous and asynchronous input/output operations. The multiplexing of sockets to achieve better performance.
- The use of threads to serve a more significant number of clients. HTTP communication to web servers.
- E-mail protocols, FTP communication with file servers, CGI programming. SMPT and POP3 protocols.
- Communication with e-mail servers. Network security. Firewall, Proxy Servers, and Routers.
- Data protection. Encryption. Control user access: authentication and authorization.
- Ping, DNS, and network monitoring. The analysis details IP, ICMP, TCP/IP, UDP, and DNS packets.
- The design and implementation of several network server-client applications.

LITERATURE

[1] Richard Blum, C# Network Programming, (2003), Sybex.

[2] David B. Makofske, Michael J. Donahoo, Kenneth L. Calvert, TCP/IP Sockets in C#, (2004), ElsevierDigital Press.

[3] Fiach Reid, Network Programming in .NET with C# and Visual Basic .NET, (2004), Elsevier Digital Press.

[4] M. O. Faruque Sarker, Python Network Programming Cookbook, (2014), Packt Publishing.

STUDENT WORKLOAD (hours in a semester)

Lectures	30	Exercises	30	Individual work	65	T o t a l	125

GRADING			REMARKS
Criterion	Maximum points	Minimum points	
Midterm exams	25	14	
Assignments	10	5	
Projects	25	14	
Final exam	40	22	
T o t a l	100	55	