DEREE COLLEGE SYLLABUS FOR:

ITC 3121 COMPUTER NETWORKS, MODELING AND ANALYSIS   **3/1.5/3**
(Updated Fall 2020)   **UK LEVEL: 5**
      UK CREDITS: 15

PREREQUISITES:	ITC 2024 Computer Networks & Cybersecurity Fundamentals
COREQUISITES:	None.
CATALOG DESCRIPTION:	Data communications technologies. Computer network systems. Network convergence architectures. Connectivity and internetworking of LANs. Broadband networking. Computer networks modeling and analysis.
RATIONALE:	The course exposes students to a wide range of concepts, from fundamentals to technical details, converged network architectures, technologies, and connectivity. Focus is placed on modern communication and networking needs, as well as modelling and analysis tools and methods. The course is suitable for students interested in study, research, or work in network technologies and related areas.
LEARNING OUTCOMES:	As a result of taking this course the student should be able to: 1. Classify networks, communication and messaging protocols and systems. 2. Identify networking infrastructure needs for LANs and WANs and examine possible wired and/or wireless solutions. 3. Explain the principles for evaluating performance and quality of service of networks. 4. Compare and contrast approaches for analyzing and modelling networks.
METHOD OF TEACHING AND LEARNING:	In congruence with the teaching and learning strategy of the college, the following tools are used: • Lectures, class discussions, and review of real-world cases based on specific theoretical concepts. Laboratory practical sessions. • Office hours: Students are encouraged to make full use of the office hours of their instructor, where they can ask questions and go over lecture material. • Use of the Blackboard Learning platform, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources.

ASSESSMENT:

Summative:

1st assessment: Midterm exam short essay questions and case problems	**30%**
2nd assessment: Portfolio of student work and oral assessment (not eligible for 2nd marking)	**10%**
Final assessment: Individual project design and implementation of a small-scale network system	**60%**

Formative:

In-class, 1-hour, "diagnostic" test: short essay questions	**0%**
Homework: case problems	**0%**

The formative assessments aim to shape teaching and prepare students for the project and the examination.
The 1st summative assessment tests the LOs 1 and 2.
The 2nd summative assessment tests the LOs 1-4.
The final summative assessment tests the LOs 1-4.

The final assessment tests all learning outcomes of this module, therefore students pass the module if the average module grade is 40% or higher.

INDICATIVE READING:	**REQUIRED READING:** 1. James F. Kurose, Keith W. Ross (2012), Computer Networking: A Top-Down Approach, Pearson Higher Education. **RECOMMENDED READING:** 1. Cisco, Introduction to Networks Companion Guide, Cisco Networking Academy. 2. Goleniewski L., Wilson Jarrett K.,(2007) Telecommunication Essentials: The Complete Global Source, Addison-Wesley Professional (latest international edition). 3. Newton, H., & Schoen, S. (2013). Newton's telecom dictionary. New York: Flatiron Books. 4. Shepard Steven, Telecom Crash Course, McGraw-Hill Professional (latest international edition).
INDICATIVE MATERIAL: *(e.g. audiovisual, digital material, etc.)*	**REQUIRED MATERIAL:** N/A **RECOMMENDED MATERIAL:** N/A
COMMUNICATION REQUIREMENTS:	Daily access to the course's site on the College's Blackboard CMS. Communication using proper written and oral English.
SOFTWARE REQUIREMENTS:	VMWare (Workstation PRO) Packet Tracer
WWW RESOURCES:	• ITU is the leading United Nations agency for information and communication technology issues: http://www.itu.int/en/pages/default.aspx • Telecommunications News: (http://www.zdnet.com) • Network Models Tutorial and Information: https://what-when-how.com/data-communications-and-networking/network-models-data-communications-and-networking/ • Computer Network Models: https://www.javatpoint.com/computer-network-models • Telecommunications Industry Association: http://tiaonline.org/ • National Telecommunications and Information Administration: http://ntia.doc.gov/ • TM Forum is the world's leading industry association focused on enabling best-in-class IT for service providers in the communications,

	media, defense and cloud service markets: http://tmforum.org/browse.aspx
INDICATIVE CONTENT:	1. Computer Networks and the Internet 2. Application Layer 3. Transport Layer 4. Messaging systems 5. Public switched telephone network (PSTN) 6. Conventional digital and data networks 7. Local area networks (LAN): Connectivity and internetworking 8. Broadband networking infrastructure and network services 9. Overview of wireless networking 10. Video and multimedia networking 11. Network convergence 12. Regulation issues 13. Probability and queuing theory fundamentals.