DEREE COLLEGE SYLLABUS FOR: ITC 4242 NETWORK DESIGN	3/0/3
(Updated Fall 2016)	**UK LEVEL 6** **UK CREDITS: 15**
PREREQUISITES:	MA 1008 College Algebra ITC 3121 Computer Networks, Modeling and Analysis
CATALOG DESCRIPTION:	Design of enterprise computer networks, concepts and best practices. Assessment of network performance.
RATIONALE:	The course is intended for students following the Network Technologies emphasis of the IT major and is an excellent preparation for the "Network Technologies Capstone Project" course. The course focuses on utilizing the top-down network design principle: designing a logical network to accommodate your current and future business plans. The course is intended for students following the Network Technologies emphasis of the IT major.
LEARNING OUTCOMES:	As a result of taking this course, the student should be able to: 1. Explain the network design process as well as scalability and security concepts. 2. Construct network designs that provide high bandwidth and low delay required for real-time applications. 3. Apply techniques to develop a baseline for measuring performance of a new network design.
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.

<table>
<tr><td>ASSESSMENT:</td><td>Summative:<table><tr><td>Project: Problem review / data collection / methodology / implementation / Simulation / Codes and Scripts.</td><td>100%</td></tr></table>Formative:<table><tr><td>In-class, 1-hour, “diagnostic” test: short answers to essay questions</td><td>0</td></tr><tr><td>Coursework: case problems</td><td></td></tr></table>The formative assessments aim to shape teaching along the semester and prepare students for the summative assessment.
The research project tests learning outcomes 1,2,3</td></tr>
<tr><td>INDICATIVE READING:</td><td>REQUIRED READING:
Oppenheimer, P. (2011). Top-down network design. Indianapolis, IN: Cisco Press.
Instructor Notes.
RECOMMENDED READING:
Aidan, F.(2010). Mastering Hyper-V Deployment. Sybex.
Berkowitz, H. C. (1999). Designing addressing architectures for routing and switching. U.S.A.: Macmillan Technical Pub.
Tittel, E., Johnson, D., (2011). Guide to Networking Essentials. Course Technology, (latest international edition).</td></tr>
<tr><td>INDICATIVE MATERIAL:
(e.g. audiovisual, digital material, etc.)</td><td>REQUIRED MATERIAL: N/A
RECOMMENDED MATERIAL: N/A</td></tr>
<tr><td>COMMUNICATION REQUIREMENTS:</td><td>Use of Blackboard CMS. Use of word processing and/or presentation graphics software for documentation of assignments.</td></tr>
<tr><td>SOFTWARE REQUIREMENTS:</td><td>GNS3 / Dynagen / Dynamips Cisco-Juniper Emulator, ns2 or ns3.</td></tr>
<tr><td>WWW RESOURCES:</td><td>Network Design resources
http://www.cisco.com/en/US/netsol/ns742/networking_solutions_program_category_home.html
http://en.wikipedia.org/wiki/Network_planning_and_design
GNS3 resources (for network labs)
http://www.gns3.net/
http://gns3vault.com/</td></tr>
</table>

INDICATIVE CONTENT:	Part I 1. Introduction to top-down methodology 2. Pre-design task list 3. Analyzing existing network infrastructure 4. Analyzing and preparing for network data traffic needs Part II 5. Logical Planning of a top-down network 6. Designing network topology, naming and address design 7. Selection of relevant switch and router protocols 8. Identifying and planning for security concerns 9. Organizing network management Part III 10. Campus Networks options (several subnets throughout a small area) & detailed case study 11. Enterprise Network options (large scale WAN with spread out networks) & detailed case study Part IV 12. Testing network design 13. Optimization of network designs 14. Documentation guidelines for network design.