

COURSE OUTLINE

NEW YORK CITY COLLEGE OF TECHNOLOGY The City University of New York

DEPARTMENT: Electrical and Telecommunications Engineering Technology

SUBJECT CODE: TCET 4282

TITLE: Telecommunication Capstone Project II

COURSE DESCRIPTION It is the second part of a two-semester senior design course that integrates telecommunication principles, problem solving skills, and lab experiences students have gained throughout their undergraduate curriculum. Students employ research and development methodology as well as troubleshooting, teamwork, project management, technical writing, and presentation. Students present final project incorporating engineering designs that are fully documented and prototyped.

REQUIRED: B.Tech Telecommunication Engineering Technology

PRE-REQUISITES: TCET 4182

CO-REQUISITES: TCET 4202 or departmental permission

TEXTBOOK Instructor notes and handouts will be used.

References:

1. Design for Electrical and Computer Engineers
By Ralph Ford Chris Coulston
McGraw Hill, 2008, 9780073380353

2. Tools and Tactics of Design
By Peter G Dominick
Wiley, 2001, 9780471386483

Students may need to buy additional design components.

TOPICS: Telecommunication technology design, coding (Multisim, MATLAB, C++), analysis of existing methods and solutions, description of possible innovative approaches to solve a problem, economics, ethics and societal impact of engineering, proposals presentation, design validations, performance in multidisciplinary design teams, system integration, testing and validation, design documentation and review, engineering management tools and techniques.

CLASS HOURS 1
LAB HOURS 2
CREDITS 2

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Description of laboratory work: The design work will include integration of various telecommunication engineering technology principles, coding, problem solving skills and lab experiences the students gained throughout their undergraduate curriculum. Students will exercise research and development methodology as well as utilize other relevant skills such as troubleshooting, teamwork, and project management. The final product/prototype will be from any kind of telecommunication technology, including wireless and optical networking technology.

GRADING POLICY: TCET 4282

Class Participation	10%
Preliminary Proposal	10%
Midterm Progress Report	15%
Final Project Report	25%
Oral presentation	15%
Prototype Demonstration	25%

Letter Grade	Numerical Grade Ranges	Quality
A	93-100	4.0
A-	90-92.9	3.7
B+	87-89.9	3.3
B	83-86.9	3.0
B-	80-82.9	2.7
C+	77-79.9	2.3
C	70-76.9	2.0
D	60-69.9	1.0
F	59.9 and below	0.0

COURSE OBJECTIVE, LEARNING OUTCOME AND ASSESSMENT: The following assessment techniques are correlated to the course objectives as follows. In addition, each assessment technique incorporates one or more of the following ABET Criterion 3 outcomes (3a-3k, PC.a - PC.e). **Few of the ABET outcomes are also considered as general education outcomes.**

Course Objective	Learning Outcome	Assessment
1. Identify a telecommunication engineering technology problem and then design and implement system,	Students will demonstrate an ability to identify telecommunication engineering technology problems	Preliminary proposal

component, program, switching technologies, and wide area networking technologies to address the problem.(ABET Criteria 3d, 3f, PC.a, PC.b).	and propose solutions to design a system or component.	
2. Apply mathematics, science and engineering principles and skills to address telecommunication engineering technology problems. (ABET Criteria 3a, 3b, PC.d)	Students will demonstrate science and engineering skills in terms of solving telecommunication engineering technology problems through research, design, and development of their project.	Midterm progress report, final project report and prototype demonstration
3. Conduct, analyze, and interpret experiments; and apply experimental results to validate/improve design processes.(ABET Criteria 3c)	Students will demonstrate ability to conduct tests and measurements to validate or improve their telecommunication design project.	Midterm progress report, final project report and prototype demonstration
4. Design and manage telecommunication network within a set of realistic constraints including societal and global impact. (ABET Criteria 3j, PC.c)	Students will demonstrate design and implementation considerations in terms of economic, environmental, ethical, health, safety, social, political, sustainability, and manufacturability issues.	Preliminary proposal.
General Education Outcomes		
5. Contribute effectively in a team and demonstrate professional and ethical responsibilities including a respect for diversity.(ABET Criteria 3e, 3i)	Students will demonstrate elements of good teamwork, such as respect for diversity, ethical responsibility, conducting self-evaluation, and providing leadership while working towards successful completion of their project.	Class/lab participation.
6. Manage telecommunication systems project in terms of timeliness and quality (ABET Criteria 3k, PCe)	Students will use a project timeline, design review, cost analysis, and other relevant tools to demonstrate project management skills and quality improvement.	Midterm progress report and final project report.
7. Understand the need for learning a new technology as part of continuous professional development. (ABET Criteria 3h)	Students will research innovative solution for given technology problems and establish the need for lifelong learning to be current in a fast paced technology field.	Midterm progress report and final project report.
8. Demonstrate oral and written communication skills. (ABET Criteria 3g)	Students will develop a written design report and oral presentation for faculty and peers.	Final project report and oral presentation.

The course contents for TCET 4282 course and the weekly tentative schedule including the series of lectures and laboratories will be the following:

Week	Lecture	Laboratory
1	Overview: • Details of capstone project • Class policies	• Form project teams • Commence preliminary literature review • Discuss preliminary project ideas
2	Project selection process: • Problem identification and description • Analysis of existing solutions • Description of possible approaches to solving the problem • Evaluation of the different approaches • Selection of approach	• Identify and describe a problem • Analyze and compare existing solutions • Select an approach and justify reasons • Finalize and get faculty approval
3	Project management: • Project lifecycle/timeline • Work Breakdown Structure (WBS) • Resource allocation	• Define specific target and timeline/milestones • Assign tasks to team members • Conduct cost analysis and resource allocation
4	Conceptual design: • Concept generation and evaluation • Requirements specifications • Deliverables	• Conceptualize and develop detailed design of block diagram • Develop detail design requirements in term of hardware and software with quantitative performance specifications • List the project deliverables
5	Detail system design: • Functional decomposition	• Develop a preliminary design including various functions of subsystems supported by experimental, analytical, computer simulation and research data
6	Critical design review (CDR) • Technical feasibility • Budget • Time • Human resource	• Verify feasibility of the project • Make necessary changes in terms of time and resources • Update timeline and WBS • Identify and order parts
7	Midterm report	• Presentation and analysis
8-12	Design implementation	• Build and troubleshoot prototype hardware and software
13-14	Test plan and final testing	• Acquire and analyze results and make any necessary adjustments
15	Presentations	• Prepare and demonstrate prototype • Oral presentation • Written final project report