

NEW YORK CITY COLLEGE OF TECHNOLOGY
OF THE CITY UNIVERSITY OF NEW YORK

ENVIRONMENTAL CONTROL TECHNOLOGY PROGRAM

ENVC 2436 - HVAC SYSTEMS COST ESTIMATING

COURSE DESCRIPTION:

A lecture course that teaches how to estimate the costs of HVAC systems. Students learn the different types of estimates, estimating forms and methods, and company overhead, mark-up, and budget prices. They also learn to estimate the costs of mechanical heating and cooling equipment, fans and blowers, cooling towers, pumps, tanks, piping, ductwork, air distribution devices, insulation, HVAC system controls, and electrical power wiring. Students will be required to complete a cost estimate for an entire air conditioning system project.

Prerequisites: ENVC 1210, ENVC 1220, ENVC 2340, MAT 1275 3 cl hrs, 3 cr.

Pre- or corequisites: ENVC 420, ENVC 432

Text: Sheet Metal and Air Conditioning Contractors' National Association, Inc., "HVAC Duct Construction Standards - Metal and Flexible", 1995.

- References:
1. R.S. Means, "Means Mechanical Cost Data - HVAC and Controls", 23rd Edition, R.S. Means Co., 2002.
 2. R.S. Means, "Means Mechanical Cost Estimating - Standards and Procedures", R.S. Means Co.
 3. Victor B. Ottaviano, "National Mechanical Estimator", Ottaviano Technical Services.
 4. John Gladstone, Kenneth K. Humphreys, & B.K. Lunde, "Mechanical Estimating Guidebook for Building Construction", McGraw-Hill, Inc.

COURSE OUTLINE - FIFTEEN WEEKS

Week	Topics
1	Introduction and course outline. Procedures used to estimate the costs of piping systems.
2	Procedures used to estimate the costs of piping systems.
3	Procedures used to estimate the costs of sheet metal duct systems.
4	Procedures used to estimate the costs of sheet metal duct systems.
5	Estimating the costs of a DX fan coil air conditioning system.
6	Estimating the costs of a rooftop air conditioning system.
7	Mid-Term Examination.

8	Review of Mid-Term Examination. Estimating the costs of a single pipe steam heating system - Part 1.
9	Estimating the costs of s single pipe steam heating system - Part 2.
10	Estimating the costs of condenser water and chilled water piping and pumping systems - Part 1.
11	Estimating the costs of condenser water and chilled water piping and pumping systems - Part 2.
12	Estimating the costs of air conditioning buildings with ductless split systems and packaged terminal air conditioners.
13	Estimating the costs of hydronic heating systems.
14	Estimating the costs of pneumatic HVAC control systems.
15	Final Examination.

General Education Student Learning Outcomes

In this course, students will obtain the following General Education competencies:

1. Economics / Business knowledge in Financial Management
2. Quantitative knowledge in Basic Math, algebra, and geometry/spatial relationships.
3. Reading skills from reading theoretical / conceptual texts
4. Reading skills from reading diagrams
5. Visual communication skills in graphic representation / visualization
6. Writing communication skills incorporating information from sources
7. Writing communication skills in description
8. Writing communication skills in analysis
9. Writing communication skills in technical reporting
10. Computer-based media skills in spreadsheet software
11. Inquiry / research skills in problem solving, choosing applicable equations / principles, utilizing math applications, and accuracy
12. Professional values in problem solving, analytical skill, decision-making, and critical judgment based on precedents
13. Ethical values in environmental stewardship.

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