

STANDARDIZED COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER: ARC 240

COURSE TITLE: ENVIRONMENTAL SYSTEMS

COURSE CATALOG DESCRIPTION: This course is an in-depth study of mechanical systems for buildings. The student will be required to understand the design of HVAC, plumbing, electrical power, lighting and thermal transfer. Emphasis is placed on system design, Building Code based design, and selection of building components. These disciplines and systems will be studied in class in the form of class lectures, demonstrations, exercises, quizzes and exams.

LECTURE HOURS: 3

CREDIT HOURS: 3

PREREQUISITE: none

CO-REQUISITE: none

SECTION II

- A. SCOPE:** Investigations will focus establishing students firm understanding of building environmental systems with regard to an architect's contract documents as well as the entire construction project from Design Development phase Construction Documents phase, bidding and construction phases. These systems and related text documents will be studied and reviewed in the form of class exercises. Current articles relating to the building industry will be read and discussed in class. Commercial and residential construction methods are explored.
- B. REQUIRED WORK:**
Students will be expected to identify the different systems and understand the components that are required for their design as well as what considerations are required in choosing one system type over another. Textbook samples of specifications and Contract Documents as well as actual specifications for reference and exercises will be implemented. They will be required to perform calculations for heat loss and heat gain as it applies to building materials. Student will be required to calculate power loads and design local circuits for electrical power systems.
Student will be expected to know and incorporate building code requirements for all system designs.
- C. ATTENDANCE AND PARTICIPATION:**
Regular attendance, assignment submissions, timeliness, promptness and class participation are expected.

D. METHODS OF INSTRUCTION

Methods of instruction include any of the following: lecture, demonstrations , group discussion, field-trips and use of classroom audiovisual and computer – based presentation materials.

E. OBJECTIVES, OUTCOMES AND ASESMENTS

1. COURSE OBJECTIVES/COMPETENCIES

LEARNING OBJECTIVES	LEARNING OUTCOMES	ASSESSMENT METHODS
To demonstrate an understanding of:	Student will:	As measured by:
Basic hydrology as it applies to plumbing systems	Use textbook examples as well as actual project examples from the field to design for supply, return, storm and sewage	Research paper, Class exercises, homework, quizzes and exams
Heat transfer as it applies to building materials	Calculate heat loss and gain of building materials	Class exercises , quizzes and exams.
Determining the design and selection of heating systems	Select appropriate fuel systems, mechanical option and physical operating requirements.	Class exercises, homework quizzes and exams
Electrical power systems, distribution and physical requirements	Understand and identify and design distribution of basic electrical power and distribution systems.	Class exercises, homework, quizzes and exams
Knowledge of current lighting systems and local power wiring systems	Calculate power loads and design local circuits.	Class exercise and homework, quizzes and exams
Acoustical concepts and their application in building systems	Understand and identify different acoustical concepts appropriate to building use.	Class exercises and homework, quizzes and exams

F. TEXT (S) AND MATERIALS

Mechanical and Electrical Equipment for Buildings, by Ben Stein, John Reynolds, 9th Ed.

G. INFORMATION TECHNOLOGY- Microsoft Word for Research paper