

Course Structure

Course Code : SM7202

Course Title : New Technologies in HVAC System

Credit Hours : 3

Course Description

knowledge of basic thermodynamic cycles and process, Psychometric Diagram, Design conditions, Basic fan and circuit working conditions, Design and selection of proper building air distribution systems, Heat transmission in buildings, Global building energy calculation, Advanced HVAC methods and solutions.

Course Objectives

The student should become acquainted with:

- Understanding the psychometric theory behind the actual technologies.
- Selecting the proper duct system and fan to provide the required air movement.
- Selecting the required elements to promote the air conditioning.
- Estimating the heat losses and solar radiation in a given system

After the course and as a natural extension, advanced technologies that may cover automatization protocols and computer based control may become straightforward for the student.

Course Topics

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- Introduction. Previous knowledge of basic thermodynamic cycles and process will be reviewed here.
- Psychometric Diagram. Moist air properties and air conditioning processes.
- Psychometric Diagram. Moist air properties and air conditioning processes. Part II.
- Design conditions: air quality and thermal considerations.
- Basic fan and circuit working conditions. Performance curves.
- Basic fan and circuit working conditions. Performance curves. Part II.
- Design and selection of proper building air distribution systems. Ventilation needs.
- Design and selection of proper building air distribution systems. Ventilation needs. Part II.
- Design and selection of proper building air distribution systems. Ventilation needs.
- Design and selection of proper building air distribution systems. Ventilation needs. Part II.
- Heat transmission in buildings.
- Solar radiation.
- Global building energy calculation.
- Global building energy calculation. Second part.
- Special applications: hospitals and schools.
- Advanced HVAC methods and solutions.

References

- Kuehn, T.H.; Ramsey, J.W.; Threlkeld, J.L., Thermal Environmental Engineering (3rd Edition), Prentice Hall, 1998.

M.Sc. in Smart Control Systems for Energy Management

Course Structure

- F.C. McQuiston and J.D. Parker, Heating, Ventilating, and Air Conditioning Analysis and Design, John Wiley & Sons, Inc. 5th Edition, 2000.
- ASHRAE, HVAC Design Manual for Hospitals and Clinics, Second Edition, 2013.