0

Department of Building Engineering	
Environmental Systmens II- Thermal Systems (68331)	
Total Credits	**3**
major compulsory	
Prerequisites	-

Course Contents

Thermal comfort in buildings (Temperature, humidity, Ventilation and Odors), heat transfer by conduction convection and radiation in buildings, Building envelope and insulation, Heat loss and heat gain in buildings, Introduction to Heating and cooling strategies, Underfloor heating system Design.

Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	Ability to understand principles of human thermal comfort and room impacts on it	A	15 %
2	Ability to calculate thermal resistances and U values for building envelopes	E	25 %
3	Ability to design energy efficient envelopes for buildings	C	20 %
4	Ability to calculate predicted heat loss/gain for buildings	E	20 %
5	Ability to design underfloor heating system	C	20 %

Textbook and/ or Refrences

Benjamin Stein and John S. Reynolds, Mechanical and Electrical Equipment for Buildings, 11th Edition, 2010, John Wiley &Sons.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Projects	10 %
Final Exam	50 %

Course Plan

Week	Topic
1-2	Thermal comfort in buildings (Temperature, humidity, Ventilation and Odors)
3-6	Heat transfer by conduction convection and radiation in buildings
7-10	Building envelope and insulation
11	Heat loss and heat gain in buildings
12	Introduction to Heating and cooling strategies
13-15	Underfloor heating system Design
16	Final Exam