

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: ENGY 320 Department: Energy Systems Technology

Course Title: Heating System Design Semester: Spring Year: 1999

Objectives/Competencies

Course Objective	Competencies
1. Identify IBR (Hydronics Institute) ratings.	1. Describe scope of IBR. 2. Explain IBR test procedure. 3. Explain IBR output ratings.
2. Identify heat loss methods.	1. Explain detailed method of calculation. 2. Explain modern method of calculation. 3. State significance of wind velocity.
3. Explain methods of determining dimensions of a building.	1. Identify wall types of a plan. 2. Explain various methods of measuring rooms. 3. Explain how to obtain ceiling heights from a plan. 4. Identify heated and unheated areas.
4. Identify structural components of a building.	1. Identify heat loss areas. 2. Identify infiltration areas. 3. Identify insulated areas. 4. Identify drainage areas.

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5. Describe concept of comfort conditioning.	<ol style="list-style-type: none"> 1. Explain how body regulates heat. 2. Identify comfort zone. 3. Locate thermostat in room.
6. Describe concept of heat flow.	<ol style="list-style-type: none"> 1. Explain where heat travels. 2. Describe heat conduction. 3. Describe heat radiation. 4. Define heat intensity. 5. Define heat quantity.
7. Explain factors relating to humidity.	<ol style="list-style-type: none"> 1. Define relative humidity. 2. Describe where humidity travels. 3. Explain importance of humidity.
8. Explain factors relating to dew point.	<ol style="list-style-type: none"> 1. Define dew point. 2. Describe principle of vapor barrier. 3. List various vapor barrier materials.
9. Explain concepts of central heating systems.	<ol style="list-style-type: none"> 1. Explain principle of conveying heat. 2. Explain principles of forced warm air heat. 3. Explain principles of forced hot water heat. 4. Explain principles of steam heat. 5. Explain principles of hydro-air heat.
10. Identify heat loss factors.	<ol style="list-style-type: none"> 1. Define exposed areas. 2. Describe materials used in construction. 3. Define heat loss factor.

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11. Define heat loss areas.	<ol style="list-style-type: none"> 4. Define thermal resistance. 5. Write formula for finding total heat loss.
12. Explain heat loss calculation through exceptional areas.	<ol style="list-style-type: none"> 1. Calculate heat loss through exposed areas. 2. Describe heat loss for various floor types. 3. Explain heat loss through various concrete surfaces. 4. Describe heat loss due to infiltration.
13. Identify glass types.	<ol style="list-style-type: none"> 1. Describe heat loss calculation for cathedral ceilings. 2. Describe heat loss through sky lights. 3. Calculate heat loss for log homes.
14. Perform total heat loss calculation.	<ol style="list-style-type: none"> 1. Define insulated glass. 2. Describe "Low E" glass. 3. Calculate equivalent square feet for glass areas. 4. Adjust calculation for storm windows.
15. Size heating system to house.	<ol style="list-style-type: none"> 1. Determine wall size and type. 2. Determine heat loss factor. 3. Calculate heat loss at 70 degree temperature difference. 4. Convert heat loss to local design temperature.
	<ol style="list-style-type: none"> 1. Calculate individual room losses. 2. Calculate total net house heat loss. 3. Select boiler water design temperature. 4. Determine proper size heating units per room. 5. Size boiler according to net load of house.

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