

Course Name: *Renewable Materials in Building Construction*

Course Number: WSE 471/571

Course Credits: 3

This course meets twice weekly for 80 minute lecture.

Prerequisites:

Junior standing

Course Content:

Building construction is a major application of renewable materials, primarily wood. This course explores material selection options, applications, and performance characteristics. Residential construction methods are explained, including green building concepts, building codes, and project planning. Concepts and interpretation of life cycle assessment are introduced.

Lecture Topics

Lecture	Topic	Assignments
1	Introduction & history of residential construction in US	
2	Primary residential construction methods	Homework #1: Const. methods
3	Residential building codes	
4	Architectural drawings 1	Homework #2: Arch. drawings
5	Architectural drawings 2	
6	Project planning and building trades	
7	Building materials 1	Homework #3: Materials list
8	Building materials 2	
9	MSDS and product specifications	
10	Exam	Building site tour 1
11	Building for durability	
12	Building for deconstruction and reuse	
13	LEED and Green Globes building protocols; product certification	Homework #4: Green building product specification*
14	Introduction to LCA	LCA group project
15	Life cycle inventory, material and energy balance	Homework #5: EcoCalculator project*
16	Life cycle impact assessment	
17	LCA data sources and validity	Homework #6: LCA data
18	LCA practicum	Building site tour 2
19	LCA practicum	
20	Review	

* WSE 571 only

Measurable Student Learning Outcomes (WSE 471):

1. Describe the scope and purpose of residential building codes.

2. Demonstrate ability to read architectural drawings and estimate building material requirements.
3. Differentiate the primary residential building construction methods used in the US.
4. Recall the major renewable building products that are available, including standard dimensions and units of measure.
5. Interpret a building material specification sheet and material safety data sheet (MSDS).
6. Recall the basic steps and progression of residential building construction.
7. Comprehend the goal and purpose of LCA and common terminology used.
8. Interpret the source of data used for life cycle inventory.
9. Interpret the convert the form of data used for life cycle inventory.
10. Make use of green building strategies and standard practices.

Measurable Student Learning Outcomes (WSE 571):

1. Describe the scope and purpose of residential building codes.
2. Demonstrate ability to read architectural drawings and estimate building material requirements.
3. Differentiate the primary residential building construction methods used in the US.
4. Recall the major renewable building products that are available, including standard dimensions and units of measure.
5. Interpret a building material specification sheet and material safety data sheet (MSDS).
6. Recall the basic steps and progression of residential building construction.
7. Comprehend the goal and purpose of LCA and common terminology used.
8. Analyze and compare the source of data used for life cycle inventory.
9. Select the form of data used for life cycle inventory.
10. Illustrate green building strategies and standard practices.
11. Evaluate residential construction projects for green building certification.

Evaluation of Student Performance:

All students are expected to read assigned material from required textbook and other literature assignments. One group project is required, with 50% of project grade uniform for all members of the group and 50% of project grade determined by peer evaluation.

Final exam is comprehensive.

	<u>Grade %</u>
Homework assignments	25
Group project	15
Building site tours	10
Mid-term exam	20
Final exam	<u>30</u>
Total	100

Graduate students enrolled in WSE571 are assigned additional independent reading and are required to complete two additional homework assignments. WSE 571 student group project must demonstrate ability to analyze and evaluate LCA data, while WSE 471 student group project must demonstrate comprehension and application of LCA concepts. Graduate student exams will contain additional synthesis questions beyond that required of undergraduates.

Learning Resources:

Required text: Fundamentals of Residential Construction, E. Allen and R. Thallon, John Wiley & Sons, Hoboken, New Jersey, 2nd Ed. 2006.

US Green Building Council, <http://www.usgbc.org/>, LEED certification

Athena Institute, <http://www.athenasmi.org/tools/ecoCalculator/>, EcoCalculator

Statement Regarding Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Expectations of Student Conduct:

Review the expectations and policy regarding student conduct at the OSU Student Conduct and Community Standards Office:

<http://oregonstate.edu/studentconduct/home/index.php>

Other course requirements:

Two field trips will be scheduled to tour local building sites. To be arranged outside of normal class meeting time. Attendance is required. If a tour is missed, an additional term paper will be assigned.