

ELEMENTS OF BUILDING DESIGN WITH RENEWABLE MATERIALS: TRADITION AND INNOVATION

WSE 225

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office hours: 8:30 am - 16:30 pm

Texts Various readings available via Canvas

Credits: 3

Term: Spring

Schedule: TR 1000-1120

Venue: FURM 405

Prerequisites: None

Course Summary:

This course will introduce you to the basic concepts of building design and the relevant technical requirements, the solutions available and the specific applications, with a focus on wood-based products and other ligno-cellulosic materials. This course is designed to help you obtain fundamental literacy and basic understanding on material properties and product specifications, to evaluate and choose a given material for a specific application, adopting quantitative and qualitative criteria. The course introduces principles of sustainable design, with a focus on the impact of materials and products. Students will develop a multi-disciplinary understanding of design and construction principles that facilitate communication between manufacturers, architects, engineers, and clients.

Course Objectives:

- Develop a knowledge of tradition and innovation in lignocellulosic building materials.
- Understand the impact of the choice of materials and the adoption of design solutions on the performance of a building.
- Understand the relationship between various physical, mechanical and functional material parameters and performance.
- Understand and demonstrate different design, manufacturing and construction strategies used in buildings.
- Understand the impact of the choice of materials and the adoption of design solutions on the environment.
- Understand principles of sustainable design.

Measurable Student Learning Outcomes:

After successful completing of this course, you should be able to:

- Recognize and describe various types of wood-based products and other renewable construction materials;
- Describe various types of physical, mechanical and functional parameters in a product or material;
- Understand the different technical requirements in a building;
- Evaluate the use of various wood products or other construction materials for specific

applications in a building.

Letter grades will be assigned as follows:

Your grade will be calculated based on the total number of points you have earned on your individual and group assignments plus any extra credit points divided by 100.

Your grade will be based on the following scale:

A 93-100%; A- 90-92%; B+ 87-89%; B 83-86%; B- 80-82%; C+ 77-79%; C 73-76%; C- 70-72%; D+ 67-69%; D 63-66%; D- 60-62%; F <60%

The list below indicates how the course learning outcomes will be measured:

- Discussion – 25 points
- Midterm exam – 35 points
- Final Report and presentation– 40 points
- Total – 100 points

General Course Agenda:

Week 1	Introduction to the course	Building requirements
Week 2	Design for sustainability	Design for assembly
Week 3	Enclosure	Water control – design for durability
Week 4	Thermal performance – design for energy efficiency	Case studies
Week 5	Acoustic performance	Indoor comfort, regenerative and biophilic design
Week 6	Review	Midterm exam
Week 7	Structure	Structural materials
Week 8	Building with linear elements	Building with panels
Week 9	Fire performance	Case studies
Week 10	Final presentations Final report due	

Course Policy

Discussion Participation

Students are expected to participate in all graded discussions, having prepared by studying the required readings and other resources.

Homework

Homework must be submitted on time for full credit. Late homework will be penalized at the discretion of the instructor.

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Statement Regarding Religious Accommodation

As instructors we are required to provide reasonable accommodations for sincerely held religious beliefs. It is incumbent on you to make us aware of the request as soon as possible prior to the need for the accommodation. See the [Religious Accommodation of Students Policy](#).

Respect for Diversity: It is my intention that all students will be well served by this course, that they feel safe and respected, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

Expectations for Student Conduct

Student conduct is governed by the university's policies; see [Student Conduct and Community Standards](#).

Academic Integrity

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Academic or Scholarly Dishonesty](#), or contact the office of Student Conduct and Community Standards (SCCS) at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.

b) It includes:

(i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).

(iv) TAMPERING - altering or interfering with evaluation instruments or documents.

(v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.