Proposal Number: CEE 20131114
Proposal Title: Establishment of Permanent Course #s for CEE Graduate Courses and Associated Changes to the Graduate Catalog

Originating Department: Civil & Environmental Engineering (CEE)

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Revised 07/31/13
OAA/mjw
LONG FORM
COURSE AND CURRICULUM PROPOSAL

To: Graduate Committee

From: Department of Civil & Environmental Engineering (CEE)

Date: November 13, 2013

Re: Proposal for New Graduate Courses (Permanent Numbers) and associated changes to CEE portion in the Graduate Catalog

A. PROPOSAL SUMMARY.

Summary:
1) The CEE Department proposes to add the following courses to its graduate curriculum leading to the MSCE and MSE degrees.

CEGR 5125 Forensic Engineering
CEGR 5126 Codes, Loads, & Nodes
CEGR 5127 Green Building & Integrative Design
CEGR 5223 Timber Design
CEGR 5273 Soil Improvement
CEGR 5274 Site Characterization
CEGR 6125 Structural Strengthening
CEGR 6162 Computer Applications for Transportation Engineers
CEGR 6163 GIS for Civil Engineers
CEGR 6164 Traffic Safety
CEGR 6243 Physical Processes in Environmental Engineering
CEGR 6245 Chemical & Biological Processes in Environmental Systems
CEGR 6244 Chemical Fate and Transport
CEGR 6251 Analysis and Design of Deep Foundations
CEGR 6253 Design of Waste Containment Systems
CEGR 6254 Experimental Soil Mechanics
CEGR 6255 Slope Stability and Earth Structures

Revised 07/31/13
OAA/mjw
The aforementioned courses have been taught several times as "topics" courses (CEGR 5090 or CEGR 6090). Copies of syllabus for each course listed above are shown in Appendix A (in the same order).

The proposed courses have been well-received by students and well-regarded by the faculty. Verbal feedback received from practitioners (both public and private sector) who hired our students indicated that the concepts and topics learned from these courses had our students well-prepared to better solve real-world engineering problems.

A review by the CEE Curriculum Committee resulted in a strong recommendation that these courses be offered as a permanent elective in the graduate curriculum, and the CEE faculty agreed. Therefore, a permanent course number and a permanent catalog description are requested.

The course numbers were identified maintaining consistency with CEE past practices and recommended guidelines.

2) In addition to including descriptions of the proposed courses in the Graduate Catalog, appropriate information was also added to the core courses listed in the catalog. Based on discussions amongst faculty of respective concentrations, some other changes (addition or deletion) are proposed to the core courses listing. These changes to the CEE portion of the Graduate Catalog are highlighted (with track changes) in Appendix B.

B. JUSTIFICATION.
The CEE department hired eleven new tenure-track faculty during the last eight years, while five faculty retired or relocated to other universities. The new faculty added breadth and depth to the expertise of the department. They offered several new courses to introduce our students to the state-of-the-art civil engineering topics and prepare them for their future.

The listed courses were taught several times during the past few years by the new faculty (as well as others who were part of CEE since prior to 2005). The courses and discussions provided ample opportunities for CEE graduate students to explore advanced / state-of-the-art concepts and, therefore, became an integral part of CEE graduate curriculum.

These courses are, often, listed on student transcripts as "special topic" without adequate detail. With multiple such courses in each concentration, most graduate students have two or more "special topics" listed on their transcripts. Since there is growing demand and need to offer these courses regularly, the best solution apparent to solve this problem is to have permanent course numbers and titles.

Further, several students benefitted by taking these courses and were hired by employers working in the subject areas. These courses also laid the foundation, exposed the students to techniques, and assisted them in conducting quality thesis and MS projects. A significant number of these efforts led to peer-reviewed publications and presentations at International, national, regional, and local conferences. Employers who hired our graduate students were not only happy
but lauded our efforts at introducing the state-of-the-art concepts. Overall, this led to strong recommendation by CEE faculty to offer these courses as a permanent elective for our graduate students.

C. IMPACT.
Graduate students admitted to MSCE and MSE programs and in good standing will be served by this proposal. Good-standing graduate students who meet the prerequisites / corequisites for the courses are eligible to register. These students are expected to have adequate fundamentals, concepts, and credentials to enroll and successfully complete the aforementioned courses.

The listed courses are at 5000- and 6000-level, which is consistent with the level of academic advancement of students for whom the courses are intended. The proposal or proposed courses does not have any effect on degree completion requirements.

It is anticipated that 10 to 20 graduate students may take the proposed courses when offered. While some proposed courses will be offered every year (either during fall or spring), others will be offered during alternate years or based on demand. These details are provided in the enclosed graduate syllabus for each proposed course (Appendix A). If the demand increases, the proposed courses may be offered more frequently.

As stated previously, several of these courses were offered multiple times during the past several years. Since they have been an integral part of CEE graduate curriculum as “topics” courses, the proposed courses are not expected to have an effect on other courses offered regularly by the faculty of CEE department. In fact, they nicely complement and strengthen the program.

The addition of the proposed courses will have an effect on information in the CEE portion of the Graduate Catalog. The assigned numbers are added to the core courses listed by concentration. Descriptions, as required, are also added for each proposed course. The recommended changes to the Graduate Catalog are shown in Appendix B.

III. RESOURCES REQUIRED TO SUPPORT PROPOSAL.
A. PERSONNEL.
No new faculty are needed to teach the courses. Current faculty who taught the courses in the past are indicated in the parenthesis for each proposed course.

CEGR 5125 Forensic Engineering (David Young)
CEGR 5126 Codes, Loads, & Nodes (Janos Gergely)
CEGR 5127 Green Building & Integrative Design (Brett Tempest)
CEGR 5223 Timber Design (David Weggel)
CEGR 5273 Soil Improvement (John Daniels / Vincent Ogunro)
CEGR 5274 Site Characterization (Vincent Ogunro)
CEGR 6125 Structural Strengthening (Janos Gergely)
CEGR 6162 Computer Applications for Transportation Engineers (Srinivas Pulugurtha)
CEGR 6163 GIS for Civil Engineers (Srinivas Pulugurtha)
CEGR 6164 Traffic Safety (Srinivas Pulugurtha)
CEGR 6243 Physical Processes in Environmental Engineering (James Bowen)
CEGR 6244 Chemical Fate and Transport (John Daniels)
CEGR 6245 Chemical & Biological Processes in Environmental Systems (J. Amburgey)
CEGR 6251 Analysis and Design of Deep Foundations (Miguel Pando)
CEGR 6253 Design of Waste Containment Systems (Hillary Inyang)
CEGR 6254 Experimental Soil Mechanics (Miguel Pando)
CEGR 6255 Slope Stability and Earth Structures (Miguel Pando)

Other faculty in the CEE Department also has the knowledge and expertise to supplement and teach the proposed courses.

B. **Physical Facility.** CEE has adequate space available to teach the aforementioned courses.

C. **Equipment and Supplies:** No additional funding is allocated for any special equipment or supplies needed to teach the listed courses.

D. **Computer.** Software installed in CEE teaching/research labs or available on Mosaic are required by students and/or faculty for some of the listed courses. The software and the number of licenses possessed by CEE are adequate and meet the anticipated needs.

E. **Audio-Visual.** No audio-visual facilities beyond the standard classroom podiums are needed to teach the courses.

F. **Other Resources.** No new/added resources (travel, communication, printing and binding) are required, hence, costs were not estimated or requested.

G. **Source of Funding.** No additional sources are required.

**IV. Consultation with the Library and Other Departments or Units**

A. **Library Consultation.**

A copy of written consultation with the Library Reference Staff (Alison Bradley) is attached for each proposed course (Appendix C).

Adequate resources are available for all courses, except "CEGR 6144: Chemical Fate and Transport." While access of materials through interlibrary loan will be sufficient, the department commits to work with the library and purchase additional items. A letter from CEE Department Chair, related to the same, is enclosed in Appendix D.

B. **Consultation with Other Departments or Units.**

Consultation with other departments or units was not necessary as the proposed courses were offered in the past, widely received by CEE graduate students, and intended primarily for CEE graduate students.
V. INITIATION, ATTACHMENTS AND CONSIDERATION OF THE PROPOSAL

A. ORIGINATING UNIT.
Discussions regarding the proposed courses contained in this proposal were initiated during the 2011-2012 academic year. The proposed courses were reviewed by the respective FAIT teams at meetings held during spring and fall 2012. A draft short-form proposal was prepared, reviewed and approved by the Department during spring 2013 for each course. As needed, this was followed by preparation of long-form proposal during fall 2013.

B. CREDIT HOUR.
Review statement and check box once completed:

X  The appropriate faculty committee has reviewed the course outline/syllabus and has determined that the assignments are sufficient to meet the University definition of a credit hour.

C. ATTACHMENTS.
1. CONSULTATION:
Consultation with other departments or units was not necessary as the proposed courses were offered in the past, widely received by CEE graduate students, and intended primarily for CEE graduate students.

2. COURSE OUTLINE/SYLLABUS:
Syllabus with necessary details, as required for graduate courses, is provided for each proposed course in Appendix A.

3. PROPOSED CATALOG COPY: Copy should be provided for all courses in the proposal. Include current subject prefixes and course numbers, full titles, credit hours, prerequisites and/or corequisites, concise descriptions, and an indication of when the courses are to be offered as to semesters and day/evening/weekend. Copy and paste the current catalog copy and use the Microsoft Word “track changes” feature (or use red text with “strike-through” formatting for text to be deleted, and adding blue text with “underline” formatting for text to be added).

a. For a new course or revisions to an existing course, check all the statements that apply:

__X__ This course will be cross listed with another course.
__    ___ There are prerequisites for this course.
__    ___ There are corequisites for this course.
__    ___ This course is repeatable for credit.
__    ___ This course will increase/decrease the number of credits hours currently offered by its program.
__    ___ This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

For all items checked above, applicable statements and content must be reflected in the proposed catalog copy.
b. If overall proposal is for a new degree program that requires approval from General Administration, please contact the facultygovernance@uncc.edu for consultation on catalog copy.

A copy of CEE portion of the Graduate Catalog with track changes is enclosed as Appendix B.

4. **ACADEMIC PLAN OF STUDY (UNDERGRADUATE ONLY):** Does the proposed change impact an existing Academic Plan of Study?
   - □ Yes. If yes, please provide updated Academic Plan of Study in template format.
   - □ No.

5. **STUDENT LEARNING OUTCOMES:** Does this course or curricular change require a change in SLOs or assessment for the degree program?
   - □ Yes. If yes, please detail below.
   - X No.

6. **TEXTBOOK COSTS:** It is the policy of the Board of Governors to reduce textbook costs for students whenever possible. Have electronic textbooks, textbook rentals, or the buyback program been considered and adopted?
   - X Yes. Considered where appropriate.
   - □ No.
APPENDIX A.
CEGR 5125 Forensic Engineering

Proposed and to be taught by:
Dr. David T. Young, Professor of Civil & Environmental Engineering

Graduate Catalog – Information and Description
CEGR 5125. Forensic Engineering. (3). Prerequisite: CEGR 3122 – Structural Analysis I, or consent of the instructor, graduate student status. Evaluation of structural and construction failures through review of case studies, types and causes of failures, and relevant methods of failure investigation; analysis of failures occurring in a variety of structures, involving a variety of materials, and resulting from a variety of causes; development, expression, and defense of opinions and conclusions, orally and in writing, with an understanding of the impact on the legal process surrounding a failure claim. (Fall, alternate years)

Course Objectives
1) Students will understand, through case studies, the types and causes of structural failures and relevant methods of failure investigation
2) Students will understand the impact of engineering opinions on legal proceedings

# Credit Hours: 3

Frequency: Offered every fall semester

Instruction Method: Lecture

Course Outcomes
1) Students will be able to investigate, analyze, and draw conclusions regarding structural failures occurring in a variety of structures, involving a variety of materials, and resulting from a variety of causes.
2) Students will be able to express and defend their opinions orally and in writing with an understanding of the impact of their opinion on the legal process surrounding a failure claim.

Textbook:

Expectation:
Students will gain an understanding of structural theories governing failures as well as a systemic perspective of failures. Proof of these accomplishments will come through homework assignments, projects, quizzes, and exams.

Grading: Homework 10% Projects 20%
1 Quiz 35% Final Exam 35%
TOTAL 100%
Homework:
1) Unless otherwise noted on "Course Outline", homework will be due on Wednesday at the beginning of class, one week after it is assigned.
2) Homework will be collected, graded, and returned within one week. Late homework will not be accepted.

General:
- No makeup exams will be given without a written excuse or notification to the professor before the exam. No extra credit assignments will be made. Concerns about quiz grading should be expressed in writing and turned in with the quiz for review by the professor.
- Students are encouraged to discuss their homework with colleagues in the class. However, work turned in for credit must be an individual's own work.
- The UNC Charlotte Code of Student Academic Integrity will be enforced.

Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Failure Case Studies (CS)</th>
<th>Reference</th>
<th>Assignments</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Introduction; Classifications of Failures</td>
<td>Numerous examples</td>
<td>Chapter 1</td>
<td>HW #1 assigned</td>
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<tr>
<td>2</td>
<td>Conducting an Investigation - process and style</td>
<td>Numerous examples</td>
<td>Chapter 1</td>
<td>HW #1 due HW #2 assigned</td>
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<td>Construction-related Failures; Preparing a Forensics Proposal</td>
<td>CS #1 = Timber and masonry church in Huntersville, NC</td>
<td>Chapter 1</td>
<td>HW #2 due HW #3 assigned Proj. No. 1 assigned</td>
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<td>4</td>
<td>Failures in Historic Structures</td>
<td>CS #2 = Timber, masonry, limestone church in Charleston, SC</td>
<td>Chapter 22</td>
<td>HW #3 due HW #4 assigned</td>
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<td>5</td>
<td>Failures Due to Wind</td>
<td>CS #3 = Hotel steel roof structure in Boone, NC</td>
<td>Chapter 2</td>
<td>HW #4 due HW #5 assigned</td>
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<td>6</td>
<td>Failures Due to Tornadoes, Hurricanes, &amp; Natural Disasters</td>
<td>CS #4 = Timber and masonry apartment complex in Raleigh, NC</td>
<td>Chapter 22</td>
<td>HW #5 due HW #6 assigned Project #1 due</td>
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<td>Midterm Exam on Lectures No. 1 - 5</td>
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<td>8</td>
<td>Failures in Stone and Steel Structures Non-Destructive Testing Preparing a Forensics Report</td>
<td>CS #5 = High-rise steel and limestone office building in Charlotte, NC</td>
<td>handouts</td>
<td>HW #6 due HW #7 assigned</td>
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<td>Failures in Concrete Structures</td>
<td>CS #6 = Reinforced concrete water treatment facility in Albemarle, NC</td>
<td>handouts</td>
<td>HW #7 due HW #8 assigned Proj. No. 2</td>
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<td>Responsibilities of a Forensic Engineer</td>
<td>CS #7 = Medium-rise steel building, Charlotte, NC</td>
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<td>Failures Due to Vibrations</td>
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<td>Failures Related to Safety</td>
<td>CS #8 = Traditional scaffolding collapse</td>
<td>HW #9 due assigned</td>
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<td>CS #9 = Crane boom collapse</td>
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<td>Failures Due to Blast, Explosion</td>
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<td>CS #11 = Historic residence, Concord, NC</td>
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<td>13</td>
<td>Failures Due to Fire Statistical Sampling</td>
<td>CS #12 = Heavy timber restaurant in Chlt, NC</td>
<td>HW #11 due</td>
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<td>for Testing</td>
<td>CS #13 = Concrete/masonry dormitory in Chlt, NC</td>
<td>HW #12 assigned</td>
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<td>CS #14 = Steel-frame warehouse, Harrisburg, NC</td>
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<td>Forensics = Legal Aspects of Failure</td>
<td>Case Studies (CS) # 1, 3, 6</td>
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<td>Forensics = Legal Aspects of Failure</td>
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<td>Investigations</td>
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<td>HW #14 assigned</td>
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CEGR 5126 Codes, Loads, & Nodes

Proposed and to be taught by:
Dr. Janos Gergely, Associate Professor of Civil & Environmental Engineering

Graduate Catalog – Information and Description
CEGR 5126. Codes, Loads, and Nodes. (3). Prerequisite: CEGR 3122 – Structural Analysis I, with a grade C or better, graduate student status. Building systems and components; code requirements according to the latest ASCE Standard 7 pertaining to buildings and other structures; gravity load analysis including dead, live, roof live and snow loads; lateral load analysis focusing on wind and seismic forces, and applied to the main lateral load resisting systems; software applications using the SAP2000 tool, with 2-D and 3-D models loaded with gravity and lateral loads. (Fall)

# Credit Hours: 3

Frequency: Offered every fall semester

Instruction Method: Lecture

Text: handouts

Mandatory Code (will be purchases through ASCE):

Other helpful Publications

Prerequisites: CEGR 3122 – Structural Analysis I, with a grade C or better, graduate student status.

Course Objectives
The course will provide information on standard codes pertaining to building loads, including dead, live, roof, snow loads, wind and seismic forces. The students will also have an opportunity to use the latest SAP2000 software (available to engineering students on the MOSAIC network) to analyze realistic 2-D and 3-D buildings, using the above mentioned loads and code required load combinations.
The class will be focused primarily on building loads, but many of its applications are transferable to the bridges and other structures, and to the geotechnical field (after all, something has to hold up all those structures...). As such, the knowledge of the topics covered in this class will be essential in upper (undergraduate and undergraduate) level structural design courses, as well as in the successful completion of senior design projects with a structural emphasis.

**Student Conduct**

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity (latest revision). This code forbids cheating, fabrication, or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Students who violate the code can be expelled from UNCC. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade.

In almost all cases, the course grade is reduced by a letter grade— at a minimum. Copies of the code can be obtained from the Dean of Student Office. CE Department policy is that ALL instances of suspected cheating be handled according to The UNCC Code of Student Academic Integrity (latest revision). During this class, each student will be required to work independently, and submit their own solution for each assignment, unless the assignment specifies a team project. No teamwork or copying will be allowed.

**Homework Assignments**

New assignments will be given at the beginning of the class. Unless otherwise specified, each problem will be solved using calculators (not computers). Homework problems are due at the start of the class on the due date! Each problem will contain: problem number, a complete statement (figures, etc.) of the given and the required, and a complete solution. The answer will be clearly indicated, including all the necessary calculations and drawings. Problems not submitted on time and in proper format will not be accepted without an acceptable excuse. Copying the homework is not allowed, anyone so doing, or so allowing, will be charged according to the Academic Code.

**Midterm and Exam Schedule**

Students are expected to attend class regularly and punctually, failure to do so will result in a lower class grade. A grade zero will be given any student who misses an exam unless a valid excuse is presented promptly in writing. Any absence that is predictable should be discussed with the course instructor in advance. Check the exam schedules to see if you have a valid exam conflict. You must notify me via an appropriate form of any such conflict involving this class by the end of Drop-Add.

**Grading**

- Course Grade: (A=90-100, B=80-89, C=70-79, D=60-69, F=0-59). Grade can be roughly estimated from the following:
  - Homeworks............. 25%
  - Quizzes.................. 10%
  - Midterm.................. 30%
  - Final ................... 35%
Additional Course Requirements
- Your written work must be *neatly presented* and easily followed.
- *Dimensioning* should use standard engineering graphics procedures.
- *Units* are very important – show units on all intermediate answers as well as on the final answer.
- When a textbook or design code is utilized to obtain any data, the page number, table number, and/or equation number must be appropriately referenced.
- Computer applications will be used throughout the semester to illustrate different load paths in buildings, make sure you have a MOSAIC account with available disk space. However, unauthorized PC and phone use during the class will not be permitted!

Course Outline
Introduction
Building Systems and Components
Structural Codes
Building Loads
  - Gravity Loads (dead, live, roof live)
  - Snow Loads
  - Wind Forces
  - Seismic Forces
Load Combinations
Load Paths in Buildings
Computer Applications
  - 2-D Analyses
  - 3-D Analyses
CEGR 5127 Green Building and Integrative Design

Proposed and to be taught by:
Dr. Brett Tempest, Assistant Professor of Civil & Environmental Engineering

Graduate Catalog -- Information and Description
CEGR 5127. Green Building and Integrative Design. (3). Prerequisite: CEGR 3122 – Structural Analysis I, or consent of the instructor, graduate student status. Course topics prepare students to function in multidisciplinary design teams working to produce buildings, sites and coupled environmental-infrastructure systems with resilience and sustainability as design priorities. Focus areas include civil engineering aspects of energy use, material use, emissions generation and design strategies for integrated design. (On demand)

# Credit Hours: 3

Frequency: On demand

Instruction Method: Lecture

Course Objectives
Course topics prepare students to function in multidisciplinary design teams working to produce buildings, sites and coupled environmental-infrastructure systems with resilience and sustainability as design priorities. Focus areas include civil engineering aspects of energy use, material use, emissions generation and strategies for integrated design. Students will develop familiarity with the issues associated with green building, current standards, and the state of the art in available design strategies and technologies available to engineers.

Prerequisites: CEGR 3122 – Structural Analysis I, or consent of the instructor, graduate student status.

Student Conduct
Students are responsible to read and adhere to the requirements of the UNC Charlotte Code of Student Academic Integrity (latest revision). This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and a further substantial reduction of the course grade. In almost all cases, the course grade is reduced to an “F”. Copies of the code can be obtained from the Dean of Student Office. The Civil Engineering Department policy is that ALL instances of suspected cheating be handled according to the UNC Charlotte Code of Student Academic Integrity (latest revision).

Deliverables and Grading

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<th>Midterm</th>
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<td>Final Exam</td>
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<td>Homework</td>
<td>15%</td>
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Case Study Presentation 15%
Group Project 30%
Project Reviews (3) 10%
Participation & Attendance 5%

A- 90-100
B- 80-90
C- 70-80
D- 60-70
F- <60

Course Outlines
1) Site Planning- Consideration of topography, vegetation, solar access and surroundings to locate and orient buildings and other features.
2) Design Strategies- Integrated design, the charrette, energy and solar modeling.
3) Structural Systems – Opportunities for structural components to do double-duty as pieces of the indoor environmental control system (chilled beam, radiant floor, etc); traditional design strategies to optimize weight and reduce the resource intensiveness of the structure.
4) Concrete Materials – Green concretes that incorporate waste and recycled materials; reuse of building materials; recycled materials.
6) Detailing for Performance- layers of vapor barrier and insulation systems; eliminating thermal breaks through better structural layout planning; designing for deconstruction.
7) Rating Systems and Standards- LEED, NetZero, etc.
8) Case Study- Examples of civil engineering design in existing green buildings.
CEGR 5223 Timber Design

Proposed and to be taught by:
Dr. David Weggel, Associate Professor of Civil & Environmental Engineering

Graduate Catalog – Information and Description
CEGR 5223. Timber Design. (3). Prerequisite: CEGR 3122 – Structural Analysis I, or consent of the instructor, graduate student status. Principles of Timber Design. Design of simple timber structures subjected to gravity loads and lateral forces. Computation of design loads; formulation of structural systems; design/analyze structural components and connections; structural system analysis of timber structures. Analysis of light commercial and residential structures. (Fall)

# Credit Hours: 3

Frequency: Offered every fall semester

Instruction Method: Lecture

Prerequisites: CEGR 3122 – Structural Analysis I, or consent of the instructor, graduate student status.

Course Objectives
After successfully completing this class, students will be capable of designing simple timber structures subjected to gravity loads and lateral forces. Students will be able to compute design loads applied to the structure, formulate a structural system, and design/analyze structural components and connections so that individual structural components act together as a complete structural system.

Textbook and Other Materials


Additional references will be mentioned in class as well as in the “Publications” and “References” sections of the textbook.

Grading
Course letter grades will be based on the following scale.
A: 90-100
B: 80-89
C: 70-79
D: 60-69
F: <60

Grades will be weighted based on the following percentages.
Homework 10% (see Note 1 below)
Attendance/participation 5%
Quizzes 15%
Midterm 35%
Final Exam 35%

Note:
1. A homework grade of at least 70% is required to obtain a course grade of a C or better.
2. The standards and requirements set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by announcement in class.

Homework
Unless otherwise noted, homework will be due at the beginning of class one week after it was assigned. Late homework will not be accepted. Unless otherwise noted, homework is to be solved using “calculators”, not computers. Each problem should be numbered, include a problem statement, follow a clear concise solution methodology, and reference all sources of data. The final answer(s) for each problem must be clearly identified. A portion of the homework problems will be graded at random; each student’s overall homework grade will be based on the results of these graded problems. However, solutions will be provided for all assigned problems after the homework has been submitted.

Important course Policies

Classroom Expectations
This syllabus contains the policies and expectations I have established for CEGR 5090/CEGR 4223: Timber Design. Please read the entire syllabus carefully before continuing in this course. These policies and expectations are intended to create a productive learning atmosphere for all students. Unless you are prepared to abide by these policies and expectations, you risk losing the opportunity to participate further in the course.

Classroom Environment
I will conduct this class in an atmosphere of mutual respect. I encourage your active participation in class discussions. Each of us may have strongly differing opinions on the various topics of class discussions. The conflict of ideas is encouraged and welcome. The orderly questioning of the ideas of others, including mine, is similarly welcome. However, I will exercise my responsibility to manage the discussions so that ideas and arguments can proceed in an orderly fashion. You should expect that if your conduct during class discussions seriously disrupts the atmosphere of mutual respect I expect in this class, you will not be permitted to participate further.

Minimum Time Expectations for this 3-Credit Course
This 3-credit course requires 3 hours of direct faculty classroom instruction and a minimum of 6 hours of out-of-class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: required reading, library and online research, written assignments, and studying for quizzes and exams. Budget enough hours per week for this course accordingly.

Academic Integrity
All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office or online (http://legal.unce.edu/policies/up-407).

About Cell Phones and Smart Phones
The use of cell phones, smart phones, or other mobile communication devices is disruptive, and is therefore prohibited during class. Except in emergencies, those using such devices must leave the classroom for the remainder of the class period.
Additional Course Guidelines

- All written work must be neat and organized so that it can be easily graded.
- Dimensioning should follow standard engineering graphical procedures.
- When a textbook, design code, or other reference is used to obtain pertinent data, the page number, table number, and/or equation number must be appropriately referenced.
- All quantities should be associated with the appropriate units; include units with intermediate and final answers.
- All course materials (notes, handouts, homework, quizzes, and exams) must be kept in a single notebook for “Timber Design”; this is a requirement to help us maintain ABET accreditation.
- No extra credit assignments will be given.
- No makeup exams (quizzes) will be given without proper notification before the exam (quiz).
- Failure to attend class may result in a lower course grade.
  - Work external to the university will never be an excuse for failure to: turn in any assignment on time, take any in-class quiz or exam, or attend class.

Course Outline

1. Review
2. Introduction
3. Vertical loads
4. Lateral forces (Wind/Seismic)
5. Behavior of Structures
6. Properties of Wood
7. Modification Factors
8. Glulam
9. Beam Design
10. Axial Members (Pure Tension, Tension and Bending)
11. Axial Members: Column Design (Pure Compression)
12. Column Design (Axial Load and Bending, Eccentricities)
13. Plywood and Wood Structural Panels
14. Diaphragms
15. Shearwalls
16. Connections