

**ESSEX COUNTY COLLEGE**  
**Engineering Technologies and Computer Sciences Division**  
**CET 111 – Construction Methods and Materials**  
**Course Outline**

**Course Number & Name:** CET 111 Construction Methods and Materials

**Credit Hours:** 3.0      **Contact Hours:** 3.0      **Lecture:** 3.0      **Lab:** N/A      **Other:** N/A

**Prerequisites:** Grades of “C” or better in ENG 096 and RDG 096 or placement

**Co-requisites:** None

**Concurrent Courses:** None

**Course Outline Revision Date:** Fall 2010

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**Course Description:** This course is an introduction to construction practices and materials used in construction. Emphasis is placed on the basic materials including concrete, steel, asphalt, masonry and wood. Portland cement concrete is mixed in the lab and tested for strength. Other topics covered include site preparation and grading, foundations and framing systems. A research paper is presented orally in class.

**Course Goals:** Upon successful completion of this course, students should be able to do the following:

1. demonstrate knowledge of fundamental framing for buildings;
2. demonstrate knowledge of foundations of buildings;
3. demonstrate knowledge of the composition of and the processes used to manufacture building materials;
4. demonstrate knowledge of the processes used to prepare a site for building construction; and
5. prepare a research report on a construction topic and present the report orally while working as a team.

**Measurable Course Performance Objectives (MPOs):** Upon successful completion of this course, students should specifically be able to do the following:

1. Demonstrate knowledge of fundamental framing for buildings:
  - 1.1 *describe simple platform framing;*
  - 1.2 *describe steel framing connections;*
  - 1.3 *describe reinforced concrete framing connections;*
  - 1.4 *describe masonry construction;*
  - 1.5 *describe roofing systems of buildings;*
  - 1.6 *sketch framing connections including wood, steel and reinforced concrete;*
  - 1.7 *use an engineer’s scale properly; and*
  - 1.8 *measure and compute quantities of structural elements in a building*

**Measurable Course Performance Objectives (MPOs) (continued):**

2. Demonstrate knowledge of foundations of buildings:
  - 2.1 *describe simple foundation systems including continuous footings, column footings and piles;*
  - 2.2 *compute simple footing sizes; and*
  - 2.3 *describe the construction of continuous foundations using poured concrete*
  
3. Demonstrate knowledge of the composition of and the processes used to manufacture building materials:
  - 3.1 *describe the composition of and manufacture of portland cement concrete;*
  - 3.2 *describe the mixing of Portland cement concrete;*
  - 3.3 *describe the properties of Portland cement concrete;*
  - 3.4 *describe the manufacture of iron and steel;*
  - 3.5 *describe the properties of structural steel;*
  - 3.6 *describe the manufacture of masonry units; and*
  - 3.7 *describe the contents of standard specifications such as ASTM and AASHTO*
  
4. Demonstrate knowledge of the processes used to prepare a site for building construction:
  - 4.1 *describe the steps in preparing a site for construction;*
  - 4.2 *describe excavation and fill on a site and the machinery used;*
  - 4.3 *describe methods used to shore an excavation;*
  - 4.4 *describe methods used to dewater an excavation; and*
  - 4.5 *prepare a schedule for construction activities*
  
5. Prepare a research report on a construction topic and present the report orally while working as a team:
  - 5.1 *working as a team, plan the tasks of each team member;*
  - 5.2 *research the topic and write the report;*
  - 5.3 *prepare a PowerPoint presentation;*
  - 5.4 *present the report as part of the team; and*
  - 5.5 *write a journal of the project*

**Methods of Instruction:** Instruction will consist of lecture, films, laboratory demonstrations, and research paper with oral presentation.

**Outcomes Assessment:** Test and exam questions are blueprinted to course objectives. Checklist rubrics are used to evaluate the research report and corresponding oral presentation for the presence of course objectives. Data is collected and analyzed to determine the level of student performance on these assessment instruments in regards to meeting course objectives. The results of this data analysis are used to guide necessary pedagogical and/or curricular revisions.

**Course Requirements:** All students are required to:

1. Maintain regular attendance.
2. Complete homework assignments.
3. Sit for all tests.
4. Read all assigned textbook pages.
5. Participate in classroom discussions.
6. Complete the research project with oral presentation.

**Methods of Evaluation:** Final course grades will be computed as follows:

<b>Grading Components</b>	<b>% of final course grade</b>
<ul style="list-style-type: none"><li>• <b>Homework, quizzes and class participation</b> A perusal of homework problems and quizzes and class discussion will indicate the extent to which students master course objectives.</li></ul>	<b>10 – 15%</b>
<ul style="list-style-type: none"><li>• <b>2 or more Tests</b> (dates specified by the instructor) Tests will show evidence of the extent to which students meet course objectives, including but not limited to identifying and applying concepts, analyzing and solving problems, estimating and interpreting results and stating appropriate conclusions using correct terminology.</li></ul>	<b>30 – 50%</b>
<ul style="list-style-type: none"><li>• <b>Research Project</b> The same objectives apply as with tests, but it is anticipated that students will provide evidence of synthesizing a combination of concepts.</li></ul>	<b>15 – 25%</b>
<ul style="list-style-type: none"><li>• <b>Final Exam</b> (comprehensive) The same objectives apply as with tests, but it is anticipated that students will provide increased evidence of synthesizing a combination of concepts.</li></ul>	<b>20 – 30%</b>

NOTE: The instructor will provide specific weights, which lie in the above-given ranges, for each of the grading components at the beginning of the semester.

**Academic Integrity:** Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College. Academic dishonesty includes, but is not limited to, the following:

- plagiarism – the failure to acknowledge another writer’s words or ideas or to give proper credit to sources of information;
- cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
- interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and
- fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions. Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

**Student Code of Conduct:** All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time for all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College’s Code of Conduct and attendance requirements.

**Course Content Outline:** based on the text **Construction Materials, Methods and Techniques**, 2<sup>nd</sup> edition, by Spence; published by Delmar Learning; 2007

<b>Week</b>	<b>Content/Topics</b>
1	Introduction, Framing of Buildings
2	Wood Framing
3	Steel Framing
4	Concrete Framing
5	<b>Test 1</b> , Materials: Steel
6	Aggregates for Concrete
7	Portland Cement Concrete
8	Mix Concrete in Laboratory
9	Masonry Construction
10	<b>Test 2</b> , Foundations
11	Roof Systems, Sitework
12	Sitework, Use of the Scale
13	<b>Oral Presentations</b>
14	<b>Oral Presentations</b> (continued)
15	<b>Comprehensive Final Exam</b>