

**VECELLIO CONSTRUCTION ENGINEERING AND MANAGEMENT PROGRAM  
CEE 4014 – CONSTRUCTION ESTIMATING, PRODUCTION AND COST ENGINEERING**

**Spring Semester 2013  
CRN 18127  
TORG 1060  
Tuesday & Thursday 8:00am – 9:15am**

**INSTRUCTOR:**

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**TEACHING ASSISTANT:**

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**PREREQUISITES:**

**AT LEAST A C- IN CEE 3014 ~ CONSTRUCTION MANAGEMENT (OR EQUIVALENT)**

**RECOMMENDED TEXT:**

Title: Estimating Construction Costs, Fifth Edition  
Authors: Peurifoy and Oberlender; ISBN: 0-07-253626-8  
Barry LePatner, *Broken Buildings, Busted Budgets* (Illinois: University of Chicago, 2008).

**SUPPLEMENTARY MATERIAL:**

The course text will be supplemented by a series of reading handouts and assignments. Materials will be available for download from the Course Documents section of the course SCHOLAR webpage.

Halpin, Daniel W and Senior, Boliva A., Construction Management, 4th Edition. (New York: John Wiley and Sons, 2011). Note: this is the required text for CEE 3014; you may find it a helpful reference for this course as well.

ENR Subscription: suggested, not required . . . student price \$39/yr;  
<https://www.mcgraw-hill-sales.com/enrstudentdb.htm>

## **COURSE DESCRIPTION**

**THE COURSE IS DESIGNED TO ALLOW STUDENTS TO DEVELOP AN UNDERSTANDING OF THE ESTIMATING PROCESS FROM THE INITIAL CONCEPTUAL DESIGN PHASE OF A PROJECT THROUGH TO THE PREPARATION OF THE FINAL BID ESTIMATE, AS WELL AS THE BID ITSELF.**

## **COURSE LEARNING OBJECTIVES**

**ON COMPLETION OF THE COURSE, STUDENTS WILL HAVE MADE A SIGNIFICANT CONTRIBUTION TO THEIR CAREERS AS PROFESSIONAL ENGINEERS AND BUILDERS AND WILL BE ABLE TO:**

- 1. EVALUATE A CLIENT'S CONCEPTUAL DESIGN AND PROVIDE BROAD, CONCEPTUAL COST ESTIMATES COMMENSURATE WITH THE LEVEL OF DETAIL AVAILABLE.**
- 2. PREPARE PRE-BID ESTIMATES BASED ON PARAMETERS AND HISTORICAL COST RECORDS.**
- 3. DETERMINE THE COST OF WORK CREWS BY ANALYZING LABOR, MATERIAL AND EQUIPMENT RATES AND DEVELOP BID ITEM LEVEL ESTIMATES BASED ON CREW COSTS AND CREW PRODUCTIONS.**
- 4. DESIGN CONSTRUCTION OPERATIONS AND SELECT BETWEEN ALTERNATIVE STRATEGIES TO PREPARE A CONSTRUCTION COST ESTIMATE FOR A TYPICAL CIVIL ENGINEERING PROJECT.**
- 5. TRACE THE STEPS NEEDED TO SUBMIT A BID WHICH IS RESPONSIVE TO OWNER REQUIREMENTS AND RESPONSIBLE IN TERMS OF BIDDERS' BUSINESS RISK.**
- 6. UNDERSTAND THE PROCESS USED TO TRANSFORM A BID INTO A CONSTRUCTION BUDGET AND PERFORM INTERIM COST AND PROGRESS CALCULATIONS.**
- 7. CONTRIBUTE AS A MEMBER OF AN INTEGRATED TEAM TO COMPLETE A PROJECT DESIGN.**
- 8. EXHIBIT SKILLS IN PREPARING A WRITTEN REPORT AND GIVING AN ORAL/VISUAL PRESENTATION.**

**INSTRUCTIONAL APPROACH:**

The required text and supplementary materials play a major role in the presentation of the course. Students will be required to gain an insight into the material by completing the reading assignments prior to applicable course session. Assignments will reinforce the material covered in class, in the text, and in the supplementary material. Exams will evaluate the students' understanding of the materials presented.

**GRADES AND GRADING:**

All work will be evaluated and assigned a grade on the A/F scale. The final course grade will be a weighted aggregation based on the following:

Quizzes	5 %
Assignments	25 %
Exam No. 1	10 %
Exam No. 2	15 %
Final Project	25 %
Final Exam	20 %

**Note: Students must obtain a passing grade on the Final Exam to receive a passing grade for the course.**

**HONOR SYSTEM:**

The Virginia Tech Honor Code will be strictly enforced in this course. All assignments submitted shall be considered graded work and shall be completed on an individual basis unless otherwise stated. All aspects of one's coursework are covered by the Honor Code. Any suspected violations of the Honor Code will be reported to the Honor System. Honesty in one's academic work will develop into professional integrity. The faculty and students of Virginia Tech will not tolerate any form of academic dishonesty.

Cooperation and team work is encouraged and, in some cases, required, on assignments. When this is done and when the work of others is used, both courtesy and academic honesty dictate that help and source material are properly referenced.

**SPECIAL NEEDS:**

If you need adaptations or accommodations because of a disability (e.g. learning, attention deficit disorder, psychological, physical, etc.), if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible.

**ATTENDANCE & PARTICIPATION:**

Unless deemed necessary, attendance will not be regularly maintained. Students are responsible for personal attendance and timeliness. When attending a class session, be prepared to arrive on time, remain attentive during the discussion, participate in the conversation, and remain present for the duration of the session.

**QUIZZES:**

Attendance and timeliness quizzes will be proctored periodically throughout the semester. When performed, these quizzes will take place at the beginning of the class session and cover material from (1) the assigned reading for the day and/or (2) materials covered in the previous class session. Missed quizzes may not be 'made-up' for any reason. However, written documentation (e.g. from a doctor, etc.) will excuse the student from the quiz and result in the final quiz grade being averaged from the remaining quiz.

**ASSIGNMENTS:**

Students will have the opportunity to complete five (5) assignments throughout the course of the semester. These assignments will be based on materials seen in class, but may require research and investigation outside of the class discussions, text, and supplemental materials. All assignments must be completed in a professional manner. Professionalism relates to both the presentation of the submittal, as well as the timeliness of submission. Assignments must be submitted by the beginning of the class session designated. Late submissions will not be accepted or evaluated. Assignments submitted must be professionally presented, including a cover memo.

**EXAMS:**

All exams are open book and notes exams, formatted for the time allotted in the exam period. Exams will consist of two equally weighted parts: (1) written and (2) calculation. Exams 1 & 2 will cover the course material from their designated class section. The final exam will be comprehensive, covering all course materials.

**FINAL PROJECT:**

The final project will exercise a number of the skills and concepts learned throughout the semester. The project will mimic a real-life scenario and require that students participate in a project team, attend owner/contractor consultation meetings, investigate multiple project alternatives, select a value-adding alternative, document findings, and present a work proposal to a construction owner. Additional information will be provided during the FP1 Briefing.

**ETHICS:**

The Virginia Tech **Honor Code** applies to all work in this class, including homework, project and examinations. When written work is submitted for grading, it is implied that the work is the sole effort of the person, or persons, whose name(s) appears on the paper. You may seek help on the principles and applications involved in the major assignments, and you may talk to each other about these principles and applications, but you are not to simply copy the work of another person or allow another person to work a problem for you. According to the Constitution of the Virginia Tech Honor System "The fundamental beliefs underlying and reflected in the Honor Code are: (1) that trust in a person is a positive force in making that person worthy of trust, (2) that every student has the right to live in an academic environment that is free from the injustices caused by any form of intellectual dishonesty, and (3) that the honesty and integrity of all members of the university community contribute to its quest for Truth."

The ethics you are required to maintain in this academic setting are virtually the same in professional practice. I expect you to follow the VT honor code as sound ethical practice and use it in preparation for a successful career once you graduate.

Suspected violations of the Honor Code will be immediately referred to the Undergraduate Honor System for adjudication. Honor Code website:

<http://www.honorsystem.vt.edu/>

**American Society of Civil Engineers (ASCE) Code of Ethics:** Practicing civil engineers will be judged by ethical standards. If you have not already done so, I highly recommend that you acquaint yourself with the ASCE Code of Ethics:

<http://www.asce.org/Leadership-and-Management/Ethics/Code-of-Ethics/>

**Building Professionals:** While there is not a one-size-fits-all code of ethics for builders/contractors, ethical behavior is expected and the lack of it has resulted in many lawsuits. I encourage those who plan to go into the building/contractor side of the design & construction industry to review the Construction Management Association of America's ethic's policy: <http://cmaanet.org/code-of-ethics>

## **VIRGINIA TECH'S PRINCIPLES OF COMMUNITY**

Virginia Tech is a public land-grant university, committed to teaching and learning, research, and outreach to the Commonwealth of Virginia, the nation, and the world community. Learning from the experiences that shape Virginia Tech as an institution, we acknowledge those aspects of our legacy that reflected bias and exclusion. Therefore, we adopt and practice the following principles as fundamental to our on-going efforts to increase access and inclusion and to create a community that nurtures learning and growth for all of its members:

- We affirm the inherent dignity and value of every person and strive to maintain a climate for work and learning based on mutual respect and understanding.
- We affirm the right of each person to express thoughts and opinions freely. We encourage open expression within a climate of civility, sensitivity, and mutual respect.
- We affirm the value of human diversity because it enriches our lives and the University. We acknowledge and respect our differences while affirming our common humanity.
- We reject all forms of prejudice and discrimination, including those based on age, color, disability, gender, national origin, political affiliation, race, religion, sexual orientation, and veteran status. We take individual and collective responsibility for helping to eliminate bias and discrimination and for increasing our own understanding of these issues through education, training, and interaction with others.
- We pledge our collective commitment to these principles in the spirit of the Virginia Tech motto of Ut Prosim (That I May Serve).