



School of Engineering  
*Sonny Astani Department  
of Civil and Environmental  
Engineering*

## **CE 502: Construction Engineering Accounting, Finance and Strategy**

**Units: 4**

**Fall 2020—Mondays, 6:30pm to 9:50pm**

**Location:** COVID-Impacted On-Line

**Instructor:** Ed Reynolds

**Office:** KAP 200 (behind copier) if on campus

**Office Hours:** anytime by appointment, before/after class

**Contact Info:** freynold@usc.edu/714-920-9310 (leave name)

**Teaching Assistant:** Yijing Xiao

**Office:** Online

**Office Hours:** TBD

**Contact Info:** yijingxi@usc.edu

**IT Help:** DEN Help Desk

**Hours of Service:** 9am to 4pm M-F

**Contact Info:** denisc@usc.edu

### **Course Description (25 Word Catalogue Description)**

CE502 explores business skills of construction: accounting, financial concepts, strategic analysis and project finance to help future construction leaders create enduring value.

### **Expanded Course Description**

The purpose of this course is to educate, encourage and excite future leaders in the engineering fields about basic accounting, finance, control and strategic management principles that can lead to successful financial outcomes in competitive marketplaces. The course builds fundamental accounting principles early on then moves into financial analysis and financial control, before entering a study of strategic management. Strategic management builds on financial analysis and teaches students how to use business tools to evaluate business context: competitors, clients, (customers), services (products), etc. We look at all the elements of a successful firm in the context of finance, human resources, information technology, products and customer strategies. The Class ends with a review of alternative project delivery methods which is an introduction to Project Finance.

About 80% of our student population aspire to be general managers in some capacity. So I teach CE 502 from the perspective of a General Manager or President of company. From this perspective, it is crucial to know how to create, analyze, interpret and use Financial Information and Evaluate Strategy so managers can make management decisions, enhance productivity, manage cash flow, use externally hired accountants, articulate to stakeholders and enhance net worth.

### **How the Extra Unit (4<sup>th</sup> Unit) Is To Be Used (Starting Fall 2019)**

The extra unit (the fourth unit) of CE502 builds greater in-depth industry analysis based on data and market research, broadens and deepens financial analysis that is briefly reviewed in the three unit class, and builds an understanding of strategic management and planning that includes SWOT analysis, marketing differentiation, and long term planning. CE502 eliminates the redundancies that existed with the old 3-unit Strategic Management class and adds much depth in key success factor for enhancing shareholder value.

### **Learning Objectives and Outcomes**

As a result of taking CE 502, students should be able to manage their own personal finances and understand those of the construction companies many of the students hope they will someday manage. The class is intended to provide analytical skills and insight that will last and grow throughout the student's career. The core competencies achieved from completing CE502 will be the ability to manage a (construction engineering) company from the most important high-level management elements of all: CASH FLOW AND STRATEGIC PLANNING.

## **Course Notes**

SIX MODULES:

There are six modules in CE 502 around which the Class is organized:

CE 502 Modules:

1. Accounting
2. Financial Analysis
3. Business Forecasting
4. Control
5. Project Finance
6. Strategy

## **Technological Proficiency and Hardware/Software Required**

Strategic Analysis Model™ software, S.C. Abraham and Tiffani A. Argandona, December 2011 (Revised January 2017) Provided by Your Professor. The software is available here: <http://www.emeraldgrouppublishing.com/promo/strategicplanning.htm>

The required text is by Prof. Stan Abraham of Cal Poly's Business School, who also wrote the SAM™ software. This text is strong on the fundamentals and basics of business strategic planning. It provides essential definitions of terminology and the analytical frameworks you will need to conduct objective and complete strategic analyses of corporations, businesses and industries. Along these lines, SAM provides an outstanding Excel-Based financial analysis package which takes basic financial inputs and automatically generates financial analyses and managerial accounting reports for up to 5 years running.

## **Required Readings and Supplementary Materials**

### **Homework Assignments**

Homework is assigned each week and is due by midnight following the class in which they were due. In the first half of class the Homework assignments are highly analytical and have binary solutions: right and wrong. They are easy to grade. In the second half of class, homework assignments are more case based and require significant reading building on the quantitative skills developed in the first half of the class. These subject homeworks require essays that are graded for key content and do not have clear right and wrong answers. But answers must be supported by analysis and facts.

(Sample early in class and late in class homework assignments are included at the end of this document)

## **Quizzes**

There is at least one quiz in CE502. The quiz counts for no grade credit, but is used as a gauge by the professor to check students progress. Grades are handed out with smiley faces, neutral faces and frowny faces. Any student who receives a frowny face receives a phone call from the Professor to check in on her work progress, gauge if the student has the wherewithal to complete the class, and coach her to success if necessary. The quiz is usually in Class #04.

## **Workbook**

The Accounting workbook is optional, is worth 2% of the grade, and the entire workbook, completely filled out, is due on the date of the midterm. It is an approximately 32-hour exercise that provides students with the rudiments of accounting they need to know to succeed in the work world. The workbook is about 200 pages long and the answers are posted right next to the questions. Students earn full credit if they turn the workbook and two of the post-tests in completed. Students could, if they like, complete the workbook in one long sitting by just copying the answers into the blanks to earn full credits. These students would get nothing out of the exercise. Students who do the work, find the experience very worthwhile.

An example of a workbook question is this: "Assets minus Liabilities is equal to \_\_\_\_\_." The answer is located next to the question in the workbook is "Equity" (or Net Worth)

## **Term Paper**

The term paper is a team assignment of up to six or seven team members assigned randomly by the professor. The nature of the paper is to complete a financial analysis and strategic evaluation of a company assigned to the team by the professor. Two to three of the students on the team will make a 15-minute presentation on their subject on dates chosen by lottery during the midterm exam. Usually, the dates are the last three classes of the semester. The grades are rewarded on a curve from best to least good.

## **Textbooks**

Additional required reading and additional optional reading can be found in the D2L. Many times, the textbooks' editions change. I will always refer the latest edition that the bookstore orders. You may use older versions, but please buy only un-used Anthony textbooks of any age.

**“The Anthony’s Workbook”**

**(Required and Due Day of Midterm with Two Post Tests Completed)**

Title: Essentials of Accounting (edition does not matter, save money, buy old ones)  
Author: Robert N. Anthony  
Publisher: Prentice- Hall  
Edition: Latest  
ISBN: 9780136071822 (does not have to be this version/but cannot be a re-used copy)  
Type: paperback workbook with answers  
Notes: Please spend the money to buy a new clean version, not one that has been completed by previous students

Note: For Anthony’s workbook, you may use any cleaned (unsolved edition) that you want to buy. It does not have to be latest edition. You may not use a workbook that was previously used by another student or one that has been solved. You will have to pick to do two of the Tests for submittal.

**Textbook (Recommended)**

Title: Introduction to Management Accounting, Chapters 1-17/15E (chapter numbers vary)  
Authors: Charles T. Horngren, Gary L. Sundem, William O. Stratton, Dave Burgstahler, Jeff Schatzberg  
Publisher: Prentice- Hall  
Edition: Most Recent  
ISBN: 9780136102656 (2011 Version or later)  
Type: hardback  
Notes: used versions and other versions are as helpful if you want to save money

**Textbook (Required)**

Title: Strategic Planning: A Practical Guide for Competitive Success, Second Edition,  
Author: Stanley C. Abraham,  
Publisher: Emerald Publishing, London (2012)  
Edition: Most Recent  
ISBN: 978-1-78052-520-4

## **References (All Available Free, No Cost)**

AECOM 10-K and Self Published Annual Reports, 2013—2017 (available on line, through the Wall Street Journal or EDGAR, among others)

IBIS World Industry Reports (Electronic Data Bases), Available from USC’s Marshall Business Library:

23799, US Heavy Engineering Construction, current version  
54133, US Engineering Services in the US, current version  
L6722-GL, Global Engineering Services, current version

Wall Street Journal Student subscription (recommended).

Go to: [wsj.com/class](http://wsj.com/class) for a \$1/week subscription rate for the Semester

Direct Link: (2019) <https://tinyurl.com/yykaecze>

## **Description and Assessment of Assignments**

Mid-term Examination

Final Examination (Date/Time TBA)

Classroom Participation/Discussions/Questions

Homework and Quizzes

Team Term Paper (Due Dated Based on Lottery)

Accounting Workbook (due on date of Midterm)

Grades: “A” range territory > 92%, “B” range territory > 84%, “C” range territory < 84%

## **Grading Breakdown**

| <b>Assignment</b>    | <b>% of Grade</b> |
|----------------------|-------------------|
| Class Participation  | 10                |
| Homework and Quizzes | 8                 |
| Workbook             | 2                 |
| Team Term Paper      | 15                |
| Midterm              | 30                |
| Final                | 35                |
| <b>TOTAL</b>         | <b>100</b>        |

## **Grading Scale**

Grades: “A” range territory > 92%, “B” range territory > 84%, “C” range territory < 84%

**Please note the word “*territory*”.** This means that I have the latitude/discretion to assign you a grade based also on your relative grade position in class. For example, if you place 52<sup>nd</sup> out of 73 students and have a grade of 92.3, you may receive a B+. So the word “territory” is extremely important. Note that you may be awarded a B if you score 89 in the class. While there is a grade range numbering system, you are also competing against your classmates for top grades.

If you are not ready when I call on you randomly in class, you may get a low mark in participation. Classroom participation will be graded on a curve. Please try to speak in class and add something.

**Assignment Dates for Homework, Workbook, and Term Papers for HW**

|                                |                                 |                              |
|--------------------------------|---------------------------------|------------------------------|
| <b>CE 502 FALL 2020</b>        | On-Line Class via D2L and Webex |                              |
| <b>COVID IMPACTED SCHEDULE</b> | (6:30-7:55, and 8:25-9:50)      |                              |
| <b><u>Class Date</u></b>       | <b><u>Class #</u></b>           | <b><u>Assignment Due</u></b> |
| Monday, August 17, 2020        | #01                             |                              |
| Monday, August 24, 2020        | #02                             | #01                          |
| Monday, August 31, 2020        | #03/#04                         | #02                          |
| Monday, September 7, 2020      | No Class                        | Labor Day                    |
| Monday, September 14, 2020     | #05                             | #03/#04                      |
| Monday, September 21, 2020     | #06                             | #05                          |
| Monday, September 28, 2020     | #07                             | #06                          |
| Monday, October 5, 2020        | #08                             | #07/Midterm                  |
| Monday, October 12, 2020       | #09                             | #08                          |
| Monday, October 19, 2020       | #10                             | #09                          |
| Monday, October 26, 2020       | #11                             | #10                          |
| Monday, November 2, 2020       | #12                             | #11                          |
| Monday, November 9, 2020       | #13                             | #12                          |
| Monday, November 16, 2020      | <b>Reading Period</b>           | Deadline Late HWs            |
| Monday, November 23, 2020      | <b>Final Exam</b>               | 7pm-9pm                      |

| <b>Course Schedule: A Weekly Breakdown</b>  |  |  |                               |
|---|--|--|-------------------------------|
| (may be modified depending on actual Semester Dates/table above is more accurate) |  |  |                               |
|   | <b>Topics/Daily Activities</b>   | <b>Readings and Homework</b>   | <b>Deliverable/ Due Dates</b> |
| <b>Week 1</b>   | Elements of Accounting: the Balance Sheet, Income Statement, Statement of Retained Earnings, and Balance Sheet Transactions  | Textbook: Horngren/ Anthony – Chapters assigned by instructor during class meeting |                               |
| <b>Week 2</b>   | Balance Sheet Transactions and the Statement of Cash Flows   | Textbook: Horngren/ Anthony – Chapters assigned by instructor during class meeting | HW #1                         |
| <b>Week 3</b>   | Balance Sheet Transactions and Financial Analysis – the Ratios Practicing the Ratios (AECOM or other public company)   | Textbook: Horngren/ Anthony – Chapters assigned by instructor during class meeting | HW # 2                        |
| <b>Week 4</b>   | Financial Analysis – What do the Results Mean? Breakeven and Proforma Creation for Strategic Planning<br>“A Walk Down Wall Street” – overview of markets and financial investments | Textbook: Horngren/ Anthony – Chapters assigned by instructor during class meeting | HW #3                         |
| <b>Week 5</b>   | AECOM Financial Analysis using SAM software for Critical Success Factors (Deep Dive)   | Textbook: Abraham/ Anthony – Chapters assigned by instructor during class meeting  | HW #4                         |
| <b>Week 6</b>   | Construction Industry (External) Analysis -- AECOM<br>Michael Porter’s Five Forces Analysis  | Textbook: Abraham/ Anthony – Chapters assigned by instructor during class meeting  | HW #5                         |
| <b>Week 7</b>   | Competitor (External) Analysis<br>Market Share, Market Positioning, Branding, “Brand Equity”   | Textbook: Abraham/ Anthony – Chapters assigned by instructor during class meeting  | HW #6                         |



|                       |   |  |  |
|-----------------------|---|--|--|
| <b>Week 8</b>         | Internal Analysis (AECOM)<br>-- SWOT Analysis<br>(Strengths, Weaknesses,<br>Opportunities, Threats)                             | Textbook: Abraham/<br>Anthony – Chapters assigned<br>by instructor during class<br>meeting | HW #7<br><br>Midterm<br>(Workbooks Due)  |
| <b>Week 9</b>         | Long Term Company<br>Strategy: Mission, Vision,<br>Corporate Values   | Textbook: Abraham –<br>Chapters assigned by<br>instructor during class<br>meeting          | HW #8  |
| <b>Week 10</b>        | Back to Basics: Control in<br>the Construction<br>Engineering Business  | Textbook: Horngren –<br>Chapters assigned by<br>instructor during class<br>meeting         | HW #9  |
| <b>Week 11</b>        | Budgeting in the<br>Construction Engineering<br>Business  | Textbook: Horngren –<br>Chapters assigned by<br>instructor during class<br>meeting         | HW #10   |
| <b>Week 12</b>        | Project Finance<br>Introduction -- Municipal<br>Bonds, Public Private<br>Partnerships, Limited<br>Recourse Project<br>Financing | Case Studies   | Term Paper Presentations/<br>Homework #11  |
| <b>Week 13</b>        | Project Finance –<br>Evaluation of Limited<br>Recourse Financing (Small<br>Projects)  | Case Studies   | Term Paper Presentations/<br>Homework #12  |
| <b>Week 14</b>        | Project Financing –<br>Evaluation of Limited<br>Recourse Financing (Large<br>Projects)  | Case Studies   | Term Paper Presentations/<br>Homework #13  |
| <b>Week 15</b>        |   |  |  |
| <b>FINAL<br/>EXAM</b> |   |  | Date: For the date and time of the<br>final for this class, consult the USC<br><i>Schedule of Classes</i> at<br><a href="http://classes.usc.edu/">classes.usc.edu/</a> . |

## **Statement on Academic Conduct and Support Systems**

### **Academic Conduct:**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](https://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](https://policy.usc.edu/scientific-misconduct).

### **Support Systems:**

*Student Health Counseling Services - (213) 740-7711 – 24/7 on call*  
[engemannshc.usc.edu/counseling](https://engemannshc.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*  
[suicidepreventionlifeline.org](https://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call*  
[engemannshc.usc.edu/rsvp](https://engemannshc.usc.edu/rsvp)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) | Title IX - (213) 740-5086*  
[equity.usc.edu](https://equity.usc.edu), [titleix.usc.edu](https://titleix.usc.edu)

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

*Bias Assessment Response and Support - (213) 740-2421*  
[studentaffairs.usc.edu/bias-assessment-response-support](https://studentaffairs.usc.edu/bias-assessment-response-support)

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

*The Office of Disability Services and Programs - (213) 740-0776*  
[dsp.usc.edu](https://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Support and Advocacy - (213) 821-4710*

[studentaffairs.usc.edu/ssu](http://studentaffairs.usc.edu/ssu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.