

BCN 5885
METHODS AND MANAGEMENT OF HEAVY CONSTRUCTION
COURSE SYLLABUS AND SCHEDULE – FALL, 2016

SECTION: 11C5

COURSE DESCRIPTION

To teach non-engineering students the theory and practice of construction planning, methods, project management. Project Control from conception through the Construction phase. This includes: Procurement of Design Professional, Prime Contractor, Subcontractor, Construction Manager, Project/Program Manager, etc, and the definition of and delineation between each entity; Construction Contract Types; Delivery Systems; Heavy/Highway Plans Reading; Quality Assurance/Quality Control; Nuances of planning and bidding a Unit Price project.

PREREQUISITES BY ACADEMIC STANDING

J-2, S-1, or S-2

LEARNING OUTCOMES

Upon completion of the course, it is hoped that the following objectives for student learning and performance will be attained. Each student should be capable of the following:

- (1) To understand and explain the structure of the heavy construction industry and the relationships that exist between key participants.
- (2) To understand the current approach to quality applied to heavy construction.
- (3) To understand the estimating and bidding processes used in the heavy construction industry.
- (4) To understand and use common heavy construction terminology in context as it applies to project and company situations.
- (5) To understand and explain the advantages and disadvantages of various delivery systems and contract forms and variations used in the heavy/highway construction industry and identify the best form for a given situation.
- (6) To understand the purpose and application of various common types of surety bonds in the heavy construction industry.
- (7) To be able to read a basic set of heavy construction plans and understand what each symbol means.

COURSE OBJECTIVES

To demonstrate the knowledge and understanding of topics listed above by means of successfully writing and presenting a paper on a subject of importance and relevance to today's construction industry, as well as correctly answering questions posed in the form of tests, quizzes, and assignments.

COURSE TOPICS

This course consists of 11 topics. Students will be tested and quizzed on all topics and assignments will be made for most assignments to aid the student in understanding and applying the material. The course topics are listed and described below:

(1) Plans Reading

Plans for heavy/highway projects include many items not found in plans for building construction. This course will teach students how to read a set of heavy construction plans. **Exam No. 1**

(2) Parties to a heavy construction contract.

The roles of each party are defined and discussed. The ways that roles change as the project changes from phase to phase is emphasized. **Exam No. 2, Quiz (no. varies), Assignment (no. varies)**

(3) How to Build a Road

The basic steps of building a road are discussed. **Exam No. 2, Quiz (no. varies), Assignment (no. varies)**

(4) How to Build a Bridge

The basic steps of building a bridge are discussed. **Exam No. 2, Quiz (no. varies), Assignment (no. varies)**

(5) Drawings and Specs

Activities covered under this topic are procurement and payment of design professional, as well as familiarization with all contract documents produced by these individuals. Where applicable, the constructor's role in development of these documents is defined, discussed, and analyzed. Of special concern are the responsibilities incurred by different parties to the construction contract through different clauses and terms spelled out in the documents, as well as by activities undertaken by the parties. **Exam No. 2, Quizzes (no. varies)**

(6) Heavy construction delivery systems

Delivery systems are methods for an owner to employ to procure a constructed structure. Many of the delivery systems used in heavy/highway construction are identical in concept to those used in building construction, but most are either applied differently, or unique to heavy/highway construction. All delivery systems known to have been used in heavy/highway construction will be discussed. The linear (traditional) delivery system is compared to fast-track delivery systems. Many fast-track delivery systems are analyzed in depth; all are discussed. Those fast track systems that are analyzed in depth include, among others, design-build, Construction-Manager-at-Risk, and Public-Private Partnerships. Students will learn about each system and required to determine which system is preferred under a variety of project scenarios. **Exam No. 3, Quizzes (no. varies), Assignment (no. varies)**

(7) Heavy construction contract types

In this course, “contract types” refers specifically to the way in which a constructor (contractor) is paid for work rendered. The three contract types covered are Cost-Reimbursable; Lump Sum; and Unit Price. Most emphasis is placed on the Unit Price method because that is the one most used in heavy/highway construction. **Exam No. 3, Quizzes (no. varies), Assignment (no. varies)**

(8) Estimating a unit price construction project

Students are taught to bid a project using the Unit Price bidding method. Construction project bidding strategy is discussed, along with things that a contractor should avoid, such as bid shopping, bid rigging, complimentary bidding, and collusion of all descriptions. **Exam No. 4, Quizzes (no. varies), Assignment (no. varies)**

(9) Heavy construction surety bonds.

Students are taught the intricacies of the surety procedure for all projects, but special attention is given to the procedure for public infrastructure contracts. Usually a leader in the surety industry will assist the instructor in teaching this topic. **Exam No. 4, Quiz (no. varies)**

(10) Heavy construction project administration.

This topic is the most broad of those covered in the course. Items discussed and analyzed under this topic include labor productivity, worker moral and motivation, content and reason for typical meetings of project personnel, shop drawings and other submittals, construction quality, materials management, procurement (including purchasing, expediting, and counterfeiting), as-built drawings, job records, claims and disputes, etc. **Exam No. 4, Quizzes (no. varies)**

INSTRUCTOR

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GRADUATE ASSISTANT

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OFFICE HOURS

Minchin: M, W - 12:30 – 2:00pm
As needed, if in the office, or by appointment

Zhang: T, R: 12:00 – 1:30pm
As needed, if in office, or by appointment

CLASS MEETING:

Rinker 220

M: 7th and 8th pd.

W: 7th pd.

CLASS WEBSITE: Canvas

TEXTBOOKS

Required: None

Selected Readings will be assigned. Some will be copied and disseminated in class and some will be assigned as a web address or topic/title/author for the class to locate and read off the internet. There will be a cost for the FDOT Plans Reading Course material and possible other course packets.

TENTATIVE COURSE SCHEDULE

DATE	DAY	TOPIC
8/22	M	Introduction Industry Overview Plans Reading Course Assigned Photos
8/24	W	Completion of Introduction & Photos How to Build a Road Literature Review Instruction* * - Graduate section only
8/29	M	How to Build a Bridge Preconstruction Activities
8/31	W	Preconstruction Activities
9/5	M	No Class – Labor Day
9/7	W	Construction Contract Documents (Drawings and Specs) Examples of Contract Documents
9/12	M	Drawings and Specs
9/14	W	Drawings and Specs Cost Estimating and Bidding
9/19	M	Cost Estimating and Bidding
9/21	W	Cost Estimating and Bidding
9/26	M	Exam No. 1 - (FDOT Plans Reading Course)
9/28	W	Cost Estimating and Bidding
10/3	M	Exam No. 2 - (Through Cost Estimating and Bidding)
10/5	W	Contractor Procurement: Construction Contract Types

10/10	M	Construction Contract Types / DBE / EEO
10/12	W	Field Trip
10/17	M	Contractor Procurement: Delivery Systems (w/ Reading Assignment)
10/19	W	Contractor Procurement: Delivery Systems
10/24	M	Contractor Procurement: Delivery Systems
10/26	W	No Class – Recover from Field trip
10/31	M	Guest Lecturer – Richard Caby – Surety
11/2	W	Regional Competition – No Class
11/7	M	Exam No. 3 (Through Surety)
11/9	W	Guest Lecturer: Jeff Nelson Project Administration
11/14	M	Contractor Procurement: Delivery Systems Project Administration
11/17	W	Project Administration
11/21	M	Project Administration
11/23	W	No class - Thanksgiving
11/28	M	Project Administration / Procurement: Supply Chain Management, Counterfeiting in the Construction Industry
11/30	W	Procurement: Supply Chain Management, Counterfeiting in the Construction Industry
12/5	M	Exam No. 4, (Cumulative)
12/7	W	Catch-up day Super-Quiz

GRADING	<u>%</u>
Assignments	15.0*
Quizzes	15.0
Exams (1-3@ 15% each, 4 @ 20%)	65.0
Class Participation	<u>5.0</u>
Total	100.0

* - **5885 STUDENTS MUST WRITE A FIVE-PAGE LITERATURE REVIEW ON ONE OF THE FOLLOWING SUBJECTS:**

- **ALTERNATIVE TECHNICAL CONCEPTS**
- **CONSTRUCTION MANAGER / GENERAL CONTRACTOR DELIVERY SYSTEM FOR HEAVY CONSTRUCTION**
- **COUNTERFEITING IN THE CONSTRUCTION INDUSTRY**
- **DISPUTES RESOLUTION BOARDS <AND/OR> DISPUTES REVIEW BOARDS**
- **INTEGRATED PROJECT DELIVERY**

GRADING SCALE

A 93.00 – 100	B-. . . . 80.00 – 82.99	D+ . . . 67.00 – 69.99
A- . . . 90.00 – 92.99	C+ . . . 77.00 – 79.99	D 63.00 – 66.99
B+ . . . 87.00 – 89.99	C 73.00 – 76.99	D-60.00 – 62.99
B 83.00 – 86.99	C-70.00 – 72.99	E00.00 – 59.99

MAKEUP EXAM POLICY

Those who advise the instructor of their need for a makeup exam at least 24 hours prior to the scheduled exam time will be allowed to schedule a makeup exam for a time at the convenience of the instructor.

HONESTY POLICY

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

ACCOMMODATION FOR STUDENTS WITH DISABILITIES

Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

UF COUNSELING SERVICES

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- § University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- § SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- § Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- § Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

SOFTWARE USE

All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

COLLEGE OF DESIGN, CONSTRUCTION AND PLANNING SPRAY PAINTING POLICY

Spray painting, or the use of any other sort of aerosol spray, is not allowed in the Architecture Building, Rinker Hall and in Fine Arts C, except within the spray booth found in Room 211 of Fine Arts C. Students found in violation of this policy will be referred to the Dean of Students for disciplinary action.

CLASS NOTES

- NO ASSIGNMENTS SUBMITTED AFTER CLASS WILL BE ACCEPTED FOR GRADING. ASSIGNMENTS SUBMITTED AFTER CALLED FOR, BUT BEFORE THE INSTRUCTOR LEAVES THE ROOM WILL BE ELIGIBLE FOR HALF CREDIT.**
- All assignments must be submitted on straight-edged paper and stapled or paper-clipped together.**

- If you have a conflict with an examination, arrangements must be made with the instructor BEFORE the exam if there are to be alternate arrangements made (see Makeup Exam Policy above).
- The professor reserves the right to adjust the grade scale. Under no circumstances will a student's grade be lowered by this adjustment.
- For exams and in-class assignments, students are responsible for all material presented in class, all reading assignments, guest lectures, site visits, and handouts distributed in class or via the class website.
- The class period runs until 3:50pm on Mondays. Most days, the class will dismiss no later than 3:35pm, but under certain circumstances, the class may go until 3:50.
- A "Super Quiz" will be given the last day of class, which will be worth three quizzes. This quiz will cover only the material covered during THAT class period.
- Text messaging – Don't. Just don't.
- Ipods – No. No earphones. Don't look up "facts" unless the instructor asks you to do so.
- Laptops – If you must use laptops to take notes, you must see me to make such arrangements.