

BSCI 6466
Planning and Decision Making in Construction (3 Credit Hrs)

Spring 2015

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Associate Professor

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Office Hours: 4:00 – 5:00 PM (Tuesday - Thursday) or by appointment

Text Book: No text book required. Course material will be posted on Canvas.

Recommended References:

- **Risk and Decision Analysis in Projects**, John Schuyler, Project Management Institute
- **Quantitative Techniques for Decision Making in Construction**, Tang, Ahmad, Ahmed and Lu, Hong Kong University Press
- **Making Hard Decisions with Decision Tools**, Clemen and Reilly, Cengage Learning
- **Managing Risk in Construction Projects**, Smith, Merna and Jobling, Wiley Blackwell
- **Risk Management for Design and Construction**, Cretu, Stewart and Berends, Wiley
- **Economic Feasibility of Projects**, Tang, The Chinese University Press, Hong Kong

Course Description:

Applications of quantitative methods in various phases of project life cycle to assist project stakeholders in making effective planning and informed decision making.

Student Learning Outcomes (SLOs):

Upon course completion, student should be able to:

1. Apply the critical planning and decision-making process in construction projects.
2. Apply quantitative methods in problem solving and decision making throughout the project life cycle.
3. Evaluate quantitative and qualitative methods of decision making and choose the best approach to solve a given problem.
4. Analyze project data using decision making software and spreadsheets.
5. Evaluate results of data analysis and apply them in the complex decision making scenarios.
6. Create solutions of complex decision making problems.
7. Present results orally and in writing.
8. Write a scientific paper appropriate for a peer-reviewed conference proceedings or journal publication.

Course Topics: The following represents the major topics we expect to cover:

1. Introduction to quantitative approaches to decision making
2. Economic feasibility analysis for construction projects
3. Decision making under uncertainty
4. Single criteria decision making
5. Multi criteria decision making
6. Decision support software applications
7. Dealing uncertainties in cost estimation and scheduling
8. System simulation and simulation software applications
9. Optimization and forecasting problems
10. Risk analysis and management

Course Requirements/Evaluation:

Grades will be calculated using the following breakdown. The instructor has the discretion to change this breakdown.

SCALE:		BREAKDOWN:	
90-100	A	Response Papers (SLO 1, 7)	10%
80 – 89.99	B	Assignments/Group Projects (SLO 2-6)	40%
70 – 79.99	C	Tests (3, 5%, 10%, 10%) (SLO 1-6)	25%
60 – 69.99	D	Final Project (SLO 7, 8)	25%
<60	F	TOTAL	100%

Note:

Grades may be curved on a uniform basis such as normal distribution curve at the professor's discretion at the end of the semester. There may be opportunities during the semester for extra credit on homework assignments. These will be announced in the class.

Course Policy Statements:

Class Procedure: This is an online class. WebEx will be used to deliver lectures, and Canvas will be used to provide course materials. Class sessions will consist of lecture, demonstration, and discussion. Students are expected to arrive/join on time and stay for the entire period.

Participation: Participation in this class is essential to learning. Attendance is an important part of participation. You are expected to attend all class periods and participate actively and constructively for the full class duration. Students may take up to 2 excused absences by informing the instructor in advance via e-mail or phone. Student will receive a one-half point cumulative score reduction for each additional absence.

Communication: E-mail is recognized as an official means of communication by the University. You are responsible for any class requirements and schedules that are altered in a timely manner using e-mail. This is a Canvas site supported course, grades and other pertinent information will be posted on the site.

Homework: Homework assignments will be assigned and collected approximately weekly. Solutions must be submitted on CANVAS.

Make-up Tests: Upon missing a test and turning in your written excuse (within 2 class periods), it is your responsibility to contact Dr. Azhar in order to arrange a time to make-up the test. All make-up tests must be completed within one week of the last day covered by the excuse.

Academic Standards Policy: The McWhorter School of Building Science has an academic standards policy that states that any student making below a 'C' will be reviewed by an academic standards committee. The student may then be asked to leave the program or repeat the course or any other action deemed appropriate by the committee may be taken.

Cheating: The policy regarding cheating is as follows: Auburn University expects students to pursue their academic work with honesty and integrity. Violations of this principle, which are enumerated in the Tiger Cub include: (1) Any communication between students during an examination; and (2) Plagiarism (submission of work that is not one's own without proper acknowledgment).

Students with Disabilities: Students who need accommodations are asked to arrange a meeting during office hours the first week of classes, or as soon as possible, (but no later than January 16th) if accommodations are needed immediately. If you have a conflict with your instructors' office hours, an alternate time can be arranged. To set up this meeting, please contact your instructor by E-mail. Bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have an Accommodation Memo but need accommodations, make an appointment with The Program for Students with Disabilities, 1244 Haley Center, 844-2096 (V/TT).

Reading Papers

An 8-10 page published article will be provided. You will be required to thoroughly read the paper and either answer 3-4 discussion questions or write your response/critique to the main findings.

Assignments and Group Projects

Homework assignments and group projects will be related to different topics that will be discussed in this course. You will be required to complete all tasks using instructions/videos provided and submit your solution via Canvas.

Tests

Tests will include conceptual, numerical and descriptive questions. Some questions will require you to use the software learned in the class to complete the given tasks. More instructions will be provided a week before the test date.

Final Project

Students will work on an Individual Final Project which will be due on the last week of classes. Details about the final project will be provided in week 3 or 4 of classes.

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Class contact hours: 45

- Residency week: 16 hours
- Online lectures: 19 hours
- Course videos: 10 hours

Tentative Class Schedule

Residency Week

Class #	Date	Time	Topic	Remarks
1	1/6	10:00 -12:00 PM 1:00-3:00 PM	Course Introduction, Quantitative approaches to decision making, Economic feasibility analysis for construction projects	Assignment #1 given
2	1/7	1:00-6:15 PM	Economic feasibility analysis (Cont), Decision-Making under certainty, Decision tree analysis	Assignment #2 given
3	1/8	1:00-6:15 PM	Decision tree analysis (Cont), Introduction to Decision Tools Suite®	Assignment #3 given, Reading Paper #1 given
4	1/9	12:30-2:00 PM	Decision Tools Suite® (Cont), Course Review	Assignments #1 and #2 due

Post-Residency Weeks

Class #	Date	Time	Topic	Remarks
5	1/14	7 – 8:30 PM	Test 1	Response Paper #1 due; Assignment 3 due
6	1/21	7 – 8 PM	Multi criteria decision making - 1	Assignment 4 given
7	1/28	7 – 8 PM	Multi criteria decision making – 2	
8	2/4	7 – 8 PM	Monte Carlo Simulation - 1	Assignment 5 given
9	2/11	7 – 8 PM	Monte Carlo Simulation – 2	
10	2/18	7 – 8:30 PM	Test 2	
11	2/25	7 – 8 PM	Dealing uncertainties in cost estimation	Assignment 6 given
12	3/4	7 – 8 PM	Dealing uncertainties in scheduling	
13	3/11	7 – 8 PM	Optimization and forecasting problems - 1	Assignment 7 given
14	3/18	7 – 8 PM	Optimization and forecasting problems - 2	
15	3/25	7 – 8 PM	Course Review	
16	4/1	7 – 8:30 PM	Test 3	
17	4/8	7 – 8 PM	Risk Analysis and Management – 1	Assignment 8 given
18	4/15	7 – 8 PM	Risk Analysis and Management – 2	
19	4/22	7 – 8 PM	Risk Analysis and Management Case Studies	
20	4/29	7 – 9:30 PM	Final Project Presentations	Final Project Deliverables Due

Note: Ten hours of course contents will be delivered via pre-recorded videos. You are required to watch these videos along with the class lectures. The video links will be provided on Canvas.