CSM 1500 – Construction Problem Solving and Critical Thinking
Revised Course Outline and Requirements
Section 001 – Lee 2-126 – TR 8:00 AM-9:15 AM
Section 002 – Lee 2-126 – TR 12:30 PM-1:45 PM
Section 003 – Lee 2-126 – MW 2:30 PM-3:45 PM
Spring Semester 2015

Course Instructor: Jason D. Lucas, PhD – Assistant Professor
Office Hours: 2-136 Lee Hall
M, W 1:30 PM-2:30 PM
T, Th - 9:15 AM-10:15 AM and 1:45 PM-2:45 PM
Other times by Appointment

E-mail: jlucas2@clemson.edu
Office Phone: 864-656-6959

Prerequisite: CSM 1000, Construction Science and Management major or consent of department chair.

Course Description: Fundamentals and application of formal problem solving, critical thinking and ethics.

Critical Thinking Integration

This course is part of the Clemson University Thinks2 (CT2) program that is aimed at improving student critical thinking skills. Memorizing facts and being able to repeat definitions and/or procedures are not in themselves a sufficient skill set to address the complex problems facing the construction industry today. You need to develop the ability to reason, evaluate and decide if you are to be successful in your career.

Critical thinking happens when we do the following four things:

1. Try to discover the assumptions that influence the way we think and act.
2. To check out whether those assumptions are as accurate as we think they are.
3. To try and see our assumptions and resulting actions from multiple and different viewpoints.
4. Take informed action.

Course Objectives: Upon completion of the course, students should be able to:

1. Analyze and describe in writing the differences between critical and noncritical thinking including presenting the essential components of effective critical thinking using a specific example.
2. Explain the formal problem solving process and assess its advantages and disadvantages compared to intuitive problem solving.
3. Analyze and explain how the formal problem solving process is similar to and different from critical thinking.
4. Identify possible causes for a given problem and evaluate each including explaining the relevance of the information used in the assessment process and the appropriateness of procedures for investigating the causes.
5. Determine and evaluate possible solutions to specific problems consistent with identified facts utilizing the formal problem solving process.
6. Explain the basic principles of ethics.
7. Present three possible positions you could take for a specific situation utilizing the tools from the Ethical Toolbox based on the facts provided.
8. Identify flaws and inconsistencies in one or more possible positions that can be taken to a given situation.
9. Analyze complex problems through the completion of a formal research project within a team environment.
10. Present the results of the research study in written and oral format.
11. Establish an electronic internship portfolio.

Course Text: None Required

Tentative Schedule and Topical Outline: the following course schedule is subject to change as the situation demands. Any changes will be announced at least one-week in advance.

<table>
<thead>
<tr>
<th>WEEK</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
</table>
| 1    | January 7  | Course Introduction – Syllabus  
Pre-CAT Instrument Administration |
| 2    | January 12 | Introduction to Critical Thinking (CT)  
Why is it part of CSM 1500?  
How does it fit into the E-Portfolio?  
How does it fit in the rest of CSM 1500?  
Critical Thinking Definition  
Critical Thinking Fundamentals  
In-Class Exercise – “Circle of Noise” |
| 3    | January 19 | Martin Luther King Jr. Holiday – No Class on Monday  
See Schedule – Internship Portfolio Introduction – Dr. Liska |
| 4    | January 26 | Critical Thinking Exercise  
“Desert Survival Situation Problem Scenario”  
Introduction of the Problem |
|      |            | The Formal Problem Solving Process  
The 8-Step Process |
| 5    | February 2 | Formal Problem Solving Applications  
PPT – Creative Thinking |
| 6    | February 9 | Complete Creative Thinking Section  
Exam #1 – Problem Solving, Creative and Critical Thinking |
| 7    | February 16| Morality, Ethics & the Law  
Guest Speaker – Dr. Dan Wueste – Morality & Ethics  
Ethics in the Construction Industry  
Applications of Ethical Principles |
| 8    | February 23| Application of CT to more effective problem solving & ethical issues |
Course Requirements:

1. Pre and Post Course Assessment - Take the Critical Thinking Assessment (CAT) at the beginning and end of the semester on the scheduled date to evaluate and monitor your growth in critical thinking.

2. Assignments - Complete assignments and submit on assigned dates. Most assignments will be individually completed and include demonstrating the ability to differentiate facts from assumptions, evaluate various possible solutions and be able to effectively communicate in writing not only your answer(s) but also details on how you obtained them. Mastery of content and critical thinking skills and knowledge will be part of the evaluation of most weekly assignments. The basis of all assessments of all assignments will be provided as part of each assignment.

3. Class Participation – Active involvement is critical in this class. It is expected that you not only attend class but also contribute to yours and your fellow students’ learning through class and small group discussions and by questioning the material being presented including the assumptions made by the faculty and other students. In addition you should be able to recognize flaws and/or inconsistencies in material presented and evaluate information and data for consistency with established facts and/or methods. Finally, you should be able to provide a professional assessment of the material presented for the purpose of improving the teaching/learning process.

4. Quizzes – There will be unannounced quizzes over the material presented in class. The quizzes will not only seek to discover if you know the correct possible answers but also the correct process of achieving them.

5. Course Project – All students will participate in the completion of a team project and be responsible for making a written and oral presentation associated with it. The project will consist of selecting specific materials and/or systems for a given portion of a facility. And in the selection process to establish a framework of attributes used to make the final selection along with presenting a
decision-making (logic) diagram that leads to selecting the most effective and efficient materials/systems for the assigned portion of the facility. In the exploration stage of the project, you will be required to present any assumptions that you made and how they related to your selection, identify the resources being utilized to acquire needed information to make informed decisions and identify any possible inconsistencies and/or flaws in the data and/or information gathered to reach your final selection of the designated material/system. In the written portion of the project you will be required to present the process you utilized in arriving at your decisions including how your decision is based solely on the facts acquired. In the oral portion of the project you will be required to respond to challenges and/or questions as to how and why you reached the decisions you did in a constructive manner. You will be provided as part of the project assignment the rubric(s) that will be used to evaluate your performance.

6. Internship Portfolio – All CSM majors are required to document their required 800 hour construction experience in an electronic portfolio in accordance with department guidelines. All students will be required to establish the main and designated associated pages for the internship in this course and it must be approved by the designated department representative.

**Method of Course Evaluation:** the final grade for the course will be based on the following percentages:

- 5% - CAT Pre and Post Instruments (need to take both to get credit)
- 15% - Weekly Class Assignments
- 15% - Quizzes/Tests/Exams
- 25% - Research Project (written paper)
- 20% - Research Project (oral presentation)
- 15% - Class Participation / Attendance
- 5% - Internship e-portfolio setup (complete by date for credit – no partial credit)

**Grading Scale:** Less than 60…..F; Over 60.00…..D; Over 70.00 …..C; Over 80.00 …..B; Over 90.00 …..A

**Academic Integrity:**

As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a “high seminary of learning.” Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

Instances of academic dishonesty will be handled in accordance with Clemson University’s *Undergraduate Announcements* and *Faculty Manual*.

**Disability Access Statement:**

It is the university policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation.

**Department Student Expectations:**

The department unexcused absence policy is contained on the Student Behavior Expectation document attached to this outline. But specifically:
Absences -- Excused absences are only of the following types: (1) documented personal emergency beyond the student’s control; (2) pre-approved and documented university, college, or department activities. All excused absences must be documented and submitted within one week of the missed class, otherwise the absence will be considered unexcused. Only students with excused absences will be allowed to make up missed work. All documentation should be typed or photocopied and be attached to a business memorandum. Only hard-copies will be accepted—e-mail is NOT an acceptable form of documentation.

NOTE: Any student with 4 or more unexcused absences will receive an “F” for the course!

Late Attendance – A student not present at the beginning of class will be considered tardy. Two times late for the class will count as one unexcused absence.

If the professor (or guest lecturer) has not arrived after 15 minutes from the scheduled start of class, students are allowed to leave without penalty.

Last day to drop a class or withdraw without a “W” is: January 21, 2015
The last day to drop a class or withdraw without final grades is: March 13, 2015
Clemson University Department of Construction Science and Management
Expected Student Behavior

Class Attendance - Class attendance is mandatory. Unexcused absences may affect the student’s final grade at the discretion of each department faculty member as shown in the respective course syllabus. A student with two or more unexcused absences for classes that meet once a week; four or more unexcused absences for classes that meet twice a week, or six or more unexcused absences for classes that meet three times a week will, as a matter of departmental policy, be dropped from the respective course and receive an F unless the student voluntarily drops the course within the approved university time frame. Additionally, students should understand that, unless prior arrangements have been made and approved, leaving class prior to the time it has been dismissed by the faculty member is unprofessional and unacceptable, and may result in an absence being recorded.

Punctuality - Students are expected to be in class at the time it is scheduled to begin. Repeated tardiness is unacceptable. Two instances of tardiness will result in one unexcused absence. Excessive incidents of tardiness may result in a reduction of a student’s grade.

Attire - Students are expected to dress in a professional manner as if they were going to a job site as a construction industry professional. Ball caps are to be removed when in class.

Food and Drinks - Food and drink may be consumed in classrooms at the discretion of the respective faculty member. If allowed and you bring food and drink you are expected to clean up after yourself placing trash and recyclables in proper containers. Because of budget cuts, custodial staffs have been cut back. They are not expected to clean up food and drink containers left in classroom spaces. Note: only non-alcoholic beverages are to be consumed unless approved in advance for receptions at special events.

Academic Honesty - A student’s work is expected to be his/her own. Academic dishonesty of any kind is unethical and unacceptable, and will result in dismissal from class and course failure or lowering of course grade. Consequences are at the discretion of the respective faculty member, and in accordance with policy and procedure as contained in the university Student Handbook.

Ethics - The construction industry demands the highest standards of ethical conduct. There are three types of ethics: Business or Legal, Professional or Balanced, and Situational (Blanchard, K. and Peale, N.V.). Business or Legal ethics is adhering to all legal, academic and other pertinent regulations. Professional or Balanced ethics is carrying out all activities in such a manner as to be fair to everyone concerned. Finally, Situational ethics pertains to specific activities or events that may initially appear to be a “gray area” until you ask yourself: “How will I feel about myself if my actions are published in the newspaper or if I have to justify my actions to my family, friends and colleagues? Students in the Construction Science and Management Department are expected to uphold the highest standards of Legal, Professional and Situational ethics. Failure to do so will result in the student having to meet with the department Chair for disciplinary actions including possible removal from the respective courses and/or program. Reference: The Power of Ethical Management, K. Blanchard & N.V., Peale, 1982, Fawcett, New York.