# CVEN 322 - CIVIL ENGINEERING SYSTEMS II****Course Syllabus - Fall 2021********Section 501 - TR 9:35 am to 10:50 am - HEB Room 110********PLEASE NOTE: The homework problems and assignments are under constant revision during the semester. Please check this syllabus frequently for changes.****

**Professor: Lee L. Lowery, Jr., PhD, P.E.**

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| **Teaching Associate:** |    |

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| First Edition: |   Second Edition: |

Textbook:

The textbook is excellent, but over the years we have developed class notes which might enable you to do without a book. At over $100, I am willing to try anything. Only the economics part of this course requires some kind of a formal text, and any old used engineering economics textbook will work fine. The text for this class, should you choose to buy it is: Civil and Environmental Systems Engineering, by Charles S. Revelle, Earl Whitlach, and Jeff Wright; Prentice-Hall. You can use either the 1st or 2nd edition out, but the 1st edition is fine and is what I use. I understand that using two editions causes some confusion, but being able to use an inexpensive out-of-date edition which has the needed content is worth it.  The main difference is the homework problem numbering, and we've got that pretty well covered by listing both versions.

Catalog Description**:**

Civil Engineering Systems (3-0) Credit 3. I, II, S. Application of systems analysis to civil engineering design, systems synthesis and optimization techniques. Economic analysis and evaluation of engineering projects. Assignments apply engineering economics, statistical theory and optimization techniques to civil engineering problems.

Course Objectives:

* To introduce the student to the principles of engineering economics and economic evaluation techniques.
* To introduce the student to engineering optimization models, including Excel, EES, and Linear Programming, useful in optimizing engineering systems.
* To introduce the student to engineering system simulation methods using computer-aided block oriented system simulation.
* To demonstrate how system simulation, optimization techniques, and engineering economics are used for decision support in civil engineering.

Learning Outcomes

* (a) Ability to apply knowledge of basic mathematics, science, and engineering.
* (b) Ability to analyze and interpret data.
* (c) Ability to design a civil and/or ocean engineering system to meet desired needs.
* (e) Ability to formulate and solve civil and/or ocean engineering problems.
* (l) Ability to use computers to solve civil and/or ocean engineering problems.
* (m) Ability to apply probability, simulation, and economics to civil/ocean engineering decisions.

Course Prerequisites:

To take CVEN 322, you MUST have received a passing grade (no D's, F's or I's) in STAT211, or an equivalent statistics and probability course, and have completed your CBK courses.

Course Assessment:

* Graded major exams (Quiz A, Quiz B, Final Exam = 3 tests @ 30% each)
* Graded homework assignments and Readiness Assessment Tests (RATs, or Pop Quizzes) = 10%. Dates shown below.

Resources available to the student:

* Instructor of record: Dr. Lee L. Lowery, Jr.
* Teaching associate:
* Computer software ([Excel](http://sellsoftware.tamu.edu/studentmicrosoft.php), [EES](file:///C%3A%5CUsers%5Clowery%5CDocuments%5Cees%5Chowtoees%5Cees.htm), [MOR, LP, BOSS](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtomor%5Cmor.htm))
* Computers in the Civil Engineering Computer Labs
* Old 322 exams (Class was previously numbered 422)
* This semester's Lectures and Notes will be put on  the web after each class. Please email me at lowery@tamu.sde if I forget to add them each day.
* Make-up exams
* Access to the Civil Engineering Apps Server
* Homework Problems for those awaiting their books. Click here and sign in to CVEN 322 to get these files.  They are from the 1st edition.
* F. E. Exam Reference Manual - for use on the exams and for homework problems if you do not yet have a book.
* First few homework problems

**PLEASE READ THE FOLLOWING SYLLABUS INFORMATION:**

* Class Expectations
* General Information Regarding Format for Exams, Quizzes, and Homework
* Where to get help for 322
* Grading
* Attendance
* Academic Dishonesty Policy

## Each day before you come to class you should look on the list below to see what will be covered that day.

## NOTE! In the new text, Chapter 12 Engineering Economics: Interest and Equivalence starts on page 343 in most books but not all. See the Table of Contents at the front of your book. Same for Chapters 13 and 14. Adding to the confusion is the exercises inside. The chapters have no chapter designations. I will specify them as homework 12.1, 12.2, 12,5, etc. so you will what chapter they came from.

## Topics Covered:

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| Date | Class No. | Material in this column will be covered from the Revelle text, and other sources.**NOTE! Learning objectives for each day are listed on the pages below.**   | **Homework Problems, Assignments, and Hints**Each problem listed in a set is worth 10 points per problem, unless otherwise noted. Problem hints, if any, and any other relevant information are hyperlinked. For students awaiting a book ordered over the web, a copy of these problems can be found in the CVEN 322 folder of [cenotes.tamu.edu](http://cenotes.tamu.edu), Student Menu, Browse Files, Homework.pdf.All homework problems are to be handed in as a hard copy unless otherwise stated in the problem assignment. |
| Tue8/31 | 1 | [Introduction to 322](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass1%5Cintroduction.htm)[Engineering Economics]Introduction, transferring money in time, interest, cash flow tables and diagrams, early payoffs.**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <346-351>{377-382}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass1%5CClass1-346-354.htm)[Help on compound interest](http://khanexercises.appspot.com/video?v=qEB6y4DklNY) | **MANDATORY:**[Click here to begin course](file:///C%3A%5CUsers%5Clowery%5CDocuments%5Ccommon%5CHomework.htm)Next: Read all hyperlinked syllabus material at the top of this page.  Hints on homework problems are hyperlinked on the problems below. 3 homework problems from the textbook:Chap 12.[1](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-13.1.htm), 12.[2](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-13.2.htm), 12.[5](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-14.5.htm) Corrected Due class 3 |
| Thur9/2 | 2 | [Engineering Economics]Investment, rule of 72, equivalence, sub-compounding, continuous compounding, use of standard economics equations.Derive F = A(F/A , i , n), others.**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <351-355>{382-388}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass2%5CClass2-354-356.htm) | 4 homework problems from the text: Chap 12.6, 12.9 (3% rate only), 12.11, 12.[14](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-13.14.htm) correctedDue class 4 |
| Tue9/7 | 3 | [Engineering Economics][Arithmetic gradient cash flows](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClass%20notes%20general%5CArithmetic%20Gradient%20Factors.pdf), [geometric gradient cash flows](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClass%20notes%20general%5CGeometric%20Gradient%20Factors.pdf), capitalized costs, nominal vs. true interest rates, [finding unknown interest rate (internal rate of return)](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClass%20notes%20general%5CDetermine%20unknown%20interest%20rate.pdf), [finding unknown number of compounding periods.](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClass%20notes%20general%5CDetermine%20unknown%20number%20of%20periods.pdf)**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <356-361>{387-392}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass3%5CClass3-356-367.htm) | 4 homework problems from the text:Chap 12.15, 12.[18](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-13.18.htm), 12.[20](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-13.20.htm), 12.[23](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-13.23.htm)Due class 5Corrected |
| Thur9/9 | 4 | [Engineering Economics]Project comparisons, maximization of net benefits, equivalent time of projects, annual cash flow comparisons.**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <367-378>{403-413}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass4%5CClass4-367-378.htm) | 2 homework problems from the text: Chap 13.[2](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5C14.2%2815.2%29.pdf), 13.[4](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-14.4.htm)Due class 6 correctedand [Web Resume](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtohomepage%5Cwebresume.htm) (50 points)[Why this assignment?](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CResume.htm)Due class 8 (That's right, class 8) |
| Tue9/14 | 5 | [Engineering Economics]Minimum attractive rate of return, internal rate of return, payback period, break-even analysis.**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)**Online video help:** [How to set up your computer account for your "Web Resume", and then FTP files to it](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CResume%5CindexResumeSetupandFTP.htm) (Note that this file is getting outdated and may no longer work for WinSCP)\*Revelle Pages <379-387>{414-423}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass5%5CClass5-378-389.htm) | 2 homework problems from the text:Chap 13.6 (a,b,c only), 13.8 (a,b only) correctedDue class 7 |
| Thur9/16 | 6 | [Engineering Economics]Straight line depreciation, declining balance, when depreciation is allowed.**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <393-398>{433-438}[Pure 200% double declining balance notes](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass7%5C200%20DDB%20notes.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass6%5CClass6-393-399.htm) | 2 homework problems from the text:Chap 13.10, 13.[12](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-14.12.htm)Due class 8 corrected |
| Tue9/21 | 7 | [Engineering Economics]MACRS depreciation, changing from MACRS to straight line, corporate and personal taxes, effects of inflation.[MACRS depreciation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkEconomics%5CMACRSBestVersionTo20years.xls)[Tax benefits of depreciation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkEconomics%5CTax%20benefits%20of%20depreciation.xls)**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <399-420>{440-464}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass7%5CClass7-399-420.htm) | 5 problems from the text: Chap 14.1, 14.2, 14.[3](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass7%5C200%20DDB%20notes.htm), 14.5, 14.6 correctedDue class 9 |
| Thur9/23 | 8 | [Engineering Economics]Mortgages, amount required to pay a loan off early, interest paid, interest saved under various conditions, bonds.**Online video help:** [Economics](http://engineeringregistration.tamu.edu/tapedreviews/economics/index.htm)\*Revelle Pages <421-436>{465-481}[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass8%5CClass8-420-436.htm) | 5 problems from the text: Chap 14.8, 14.16, 14.[19](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkHelp%5CEco-15.19.htm), 14.29, 14.30 correctedDue class 10 |
| Tue9/28 | 9 | [Engineering System Optimization]Use of Spreadsheets & [EES](http://www.mhhe.com/engcs/mech/ees/whatisees.html)[EES User's Manual](file:///C%3A%5CUsers%5Clowery%5CDocuments%5Cees%5Cees_manual.pdf)Excel bolted plate [example](file:///C%3A%5CUsers%5Clowery%5CDocuments%5Cexcel%5Cboltedplate2.xls)EES bolted plate [example](file:///C%3A%5CUsers%5Clowery%5CDocuments%5Cees%5CPlateexample%5Cplateexample.htm)EES [manhole](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeoworkManholes%5CManholes.htm) exampleHow to download: [EES & EES Tutorial](file:///C%3A%5CUsers%5Clowery%5CDocuments%5Cees%5Chowtoees%5Cees.htm) **Online video help:** [Use of EES](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CBolts_EES%5CindexBoltsEES.htm)**Online video help:** [Solution to roof pump using EES](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CPump_EES%5CindexEESRoofPump.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass9%5CClass9.htm) | Learning to use EESWeb Problem 4.1) [Roof Pump](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkRoofpump%5CroofpumpEES.htm) problem to be solved using EESDue class 11 |
| Thur9/30 | 10 | [Engineering System Optimization]Use of EES and Excel to solve roof pump problem.**Online video help:** [Solution to roof pump using Excel (brute force) & Excel Solver Add-in](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CPump_Excel%5CindexExcelRoofPump.htm)[Excel Tutorial](http://www4.ncsu.edu/unity/lockers/users/f/felder/public/tutorials.html) (Read if you need help)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass10%5CClass10.htm)\*\*SEE FOOTNOTE BELOWRevelle pages <1-14> | Learning to use advanced features of ExcelWeb Problem 4.2: [Roof Pump](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkRoofpump%5Croofpumpexcel.htm) problem to be solved using Excel.[Comments](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkRoofpump%5CComments.htm)Due class 12 |
| Tue10/5 | 11 | [Engineering System Optimization]Use of EES and Excel to solve footing problem.  Optimization of engineering problems using Linear Programming.Use of the MOR Program.  Binary and integer vs. floating point numeric solutions.[How to solve linear programming problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtolp%5CSolving_LP_Problems.htm)[Differences between L.P. and normal equations](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CEquationSolutions.htm)[Water distribution problem](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass10%5CClass10watersupply.htm)[Solving L.P. problems by plotting](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass11%5CGraphical%20solution%20best.htm)[Excel Linear Programming Template](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomework%20solutions%5CExcel-LP-Template.xls)[Excel River/Well water problem on Template](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomework%20solutions%5CRiver-Well%20problem.xls)**Computer programs:**[How to download and run MOR.](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Cprograms%5CIndex.htm)Read: [MOR User's Manual](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtomor%5Cmor.htm)**Online video help:** * [How to add Solver into Excel](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHowtoAddSolver%5CAdd-in%20Solver.swf)
* [How to use Excel for L.P. problems (I)](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHowtoExcelLinearProg%5CExcel%20to%20do%20L.P.swf)
* [How to use Excel for L.P. problems (II](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHowtoAddSolver%5CMore-Add-In-Solver.swf))
* [MOR Installation and use](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CMOR%5CindexMOR.htm)
* [Using EES to solve the Spread Footing problem](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CFooting_EES%5CindexFootingEES.htm)
* [Using Excel to solve the Spread Footing problem](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CThings%5CCamtasia%5CFooting_Excel%5CindexFootingExcel.htm)

 [Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass11%5CClass11.htm)\*\*Revelle pages <15-30> | Learning to use MORWeb Problem 4.3: [Spread Footing](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkFooting%5CfootingEES.htm) problem to be solved using EES Due class 13 |
| Thur10/7 | 12 | [Engineering System Optimization]Linear Programming[Graphical solutions](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass11%5CGraphical.htm)[Integer solutions](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass11%5CGraphical%20solution%20best.htm)[Cut and fill problem](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CHowtocutandfill.htm), [Time independent production model I](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CTimeIndependentProduction.htm)[Time independent production model II](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass12%5CTime%20Independent%20Production%20Models.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass12%5CClass12.htm)\*\*Revelle pages <31-45> | Web Problem 4.4: [Spread Footing](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkFooting%5CfootingExcel.htm) problem to be solved using Excel.Solve using MOR:Web Problem: [5.0](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-00.html) (water distribution), Web Problem: [5.1](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-01.html) (balanced haul)Due class 14 |
| Tue10/12 | 13 | [Engineering System Optimization]Linear Programming [Waste disposal for large combined area](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CWaste%20disposal%20system.htm).[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass13%5CClass13.htm)\*\*Revelle pages <46-60> | 5 Web Problems: [5.2](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-02.html) (waste transport)[5.3](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-03.html) (% gravel hauling)[5.4](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkLp%5C5-04.html) (dirt haul)[5.5](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-05.html) (apartments)[5.6](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-06.html) (concrete haul) Due class 16 |
| Thur10/14 | 14  | [Engineering System Optimization]Balanced vs. unbalanced transportation/supply & demand problems[Balanced and unbalanced supplies and demands](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CUnbalancedSupply.htm)[Balanced and unbalanced assignments](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CUnbalancedAssignments.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass14%5CClass14.htm)\*\*Revelle pages <60-70> | 4 Web Problems:[5.10](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-10.html) (balanced shipping)[5.13](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-13.html) (gravel for road)[5.14](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-70.html) (graphic solution)[5.16](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-16.html) (regional wastewater plants),  Due class 17 |
| **Tue10/19** | **15** | **Quiz A - Covers Engineering Economics, EES, & Excel Spreadsheets, through Class #12. Linear programming is not covered.** | [Exam A](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CHumor%5CAbilityAsATeacher.htm) will be held on Tuesday 10/19/10 during regular class hours, in CE Room 110. The only material allowed in the exam is the F.E. Exam Reference Manual ([click here for a copy](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CFEReviewManuals%5CEconomics.pdf).) Bring a copy with you to the exam unless you have memorized the interest rate tables, and all equations.If you need material that is not in the reference manual, I will give it to you on the exam. Reference Manuals will be available for lease from the professor during the exam, at a cost of $1 per minute. |
| Thur10/21 | 16 | [Engineering System Optimization]Linear ProgrammingPrint out a copy of each of the following problems:[Subcontractor Bids](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CContractor.htm)[Traffic Networks](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CTrafficNets.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass15%5CClass15.htm)\*\*Revelle pages <71-80> | 4 Web Problems: [5.11](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-11.htm) (regional refuse haul)[5.17](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-17.html) (lay binding with paver)[5.21](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-21.html) (rapid transport system)[5.33](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-33.html) (assign machines)Due class 18 |
| Tue10/26 | 17 | [Engineering System Optimization]Linear Programming[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass16%5CClass16.htm)\*\*Revelle pages <81-95> | 3 Web Problems:[5.18](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-18.html) (paper)[5.62](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-62.html) (power line)[5.63](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-63.html) (Skycon)Due class 19 |
| Thur10/28 | 18 | [Engineering System Optimization]Linear Programming[Time dependent production models](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass12%5CTimeDependentProduction.htm)[Bus driver allocation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass17%5CBusAssignmentStudentVersion.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass17%5CClass17.htm)\*\*Revelle pages <129-136> | 2 Web Problems:[5.65](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-65.html) (bus shift times) Due class 20 |
| Tue11/2 | 19 | [Engineering System Optimization]Linear Programming[Open pit mining](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5COpenPitMine.htm)[Ambulance siting](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CAmbulancesProblem.htm)[Siting hamburger shoppes](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CHamburgerShoppes.htm)[Hauling when several cities generate waste](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CHaulWasteToI.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass18%5CClass18.htm)\*\*Revelle pages <137-147> | 3 Web Problems:[5.64](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-64.html) (contractor)[5.72](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-72.html) (unbalanced supplies)[5.8](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chomeworklp%5C5-08.html) (where supply < demand)Due class 21 |
| Thur11/4 | 20 | [Engineering System Simulation] Simulation of engineering systems[How to compute interarrival times](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtoboss%5Chowtointerarrivaltimes%5Chowtointerarrivaltimes.htm) - Uniform, Normal, Exponential Distributions, [Z tables](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtoboss%5Cztables%5Cztables.htm), How dynamic systems are simulated.Pop Quiz[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass19%5CClass19.htm) | Web Problem 6.0: [Determine interarrival times](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CInterarrivaltimes%5CInterarrival%20Times.htm)[.](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CInterarrivaltimes%5CInterarrival%20Times%20Answers.htm)Web Problem 6.1: [Trucking simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CHaulDirtHandSolution6-1%5CHaulDirtHandSolution6-10.htm) by hand, using [Simulation hand solution form](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtoboss%5CBoss%20Hand%20Solution%20Table.htm)[.](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CHaulDirtHandSolution6-1%5CProb%206.1%20Solution.htm)Due class 22 |
| Tue11/9 | 21 | [Engineering System Simulation] Introduction to simulation of engineering systems using Block Oriented System Simulation, (BOSS\*\*\*) NOTE: The best book on earth on simulation is available [here](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChowtoBoss%5CBOSSall.pdf).Use of the MOR/DS program, Discuss economic impact from using 1 truck, 2 trucks, 100 trucks.Pop Quiz[Hand solution simulation form.](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5Chowtoboss%5CBoss%20Hand%20Solution%20Table.htm)[Hauling dirt simulation by hand](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CDirtHaulingSystemProblem.htm),[Solution to problem](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CDirtHaulingSystem.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass20%5CClass20.htm) | Economics Web Problem 6.11:[Holtzapple](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CHomeworkEconomics%5CHoltzapple.htm)Web Problem 6.2: [Web information search and presentation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkWeb%5CProblem%206-2.htm) Web Problem 6.10: [Practice with interarrival time distributions](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CInterarrivaltimes%5CInterarrivalHomework.htm)Due class 24 |
| Thur11/11 | 22 | [Engineering System Simulation] [Typical BOSS commands (READ!)](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChowtoBoss%5CTypicalBossCommands.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass21%5CClass21.htm) | Solve using MOR/BOSS:Web Problem 6.3: [Dirt hauling simulation I](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CHaulDirt6-3%5Chauldirt6-3.htm) Due class 25 |
| **Tue11/16** | **23** | **Quiz B - Covers Engineering System Optimization and Engineering Economics, through Class #19, with emphasis on Linear Programming. Engineering Simulation is not covered.** | [Exam B](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CHumor%5CCalvin%20flunked%20exam.gif) will be held on Tuesday 11/16/10 during regular class hours in CE Room 110. The only material allowed in the exam is the F.E. exam reference manual ([click here for a copy](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CFEReviewManuals%5CEconomics.pdf).) Bring a copy with you to the exam unless you have memorized the interest rate tables, and all equations. Reference Manuals will be available for lease from the professor during the exam. |
| Thur11/18 | 24 | [Engineering System Simulation] Simulation of hauling dirt using BOSS - 2 trucks of same size[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass22%5CClass22.htm) | Solve using MOR/BOSS:Web Problem 6.4: [MacDondald's hamburger simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CHamburger6-5%5Cmacdondald6-5.htm)Due class 26 |
| Tue11/23 | 25 | [Engineering System Simulation] Show how to interpret BOSS output. Why it is necessary to run each case several timesZero time loops, and other illegal statements.Hauling dirt using BOSS - 2 trucks of different sizes[Burgers](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass21%5CHamburgers.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass23%5CClass23.htm) | Solve using MOR/BOSS:Web Problem 6.5: [Classroom simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CClassroomsimulation6-2%5C422ClassroomSimulation6-4.htm)Due class 27 |
| Tue11/30 | 26 | [Engineering System Simulation] [City intersection study](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass27%5CIntersection%20Figure.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass24%5CClass24.htm) | Web Problem 6.6: [Dirt hauling simulation II](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5CHauldirt6-6%5CHauldirt6-6.htm)Due class 28 |
| Thur12/2 | 27 | [Engineering System Simulation] [Intercoastal canal waterway study](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CDredge%20Operations.htm)[Tanker/tank farm/storm simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass25%5COil%20Tank%20Field%20and%20Loading%20Dock.htm)[Learning objectives, topics covered, example problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass25%5CClass25.htm) | Web Problem 6.7: [Tanker/tank farm simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5COilfieldTanks6-8.htm)Web Problem 6.8: [Dredging simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5Cdredging6-7.htm)Due class 28 (Yep, class 28)Homework: Thoroughly understand what we did in class today and be ready to answer similar questions on the final exam.Pick up any unreturned homework in front of my office door next Monday morning, or later. |
| Tue12/7 | 28 | [Engineering System Simulation] [Racing crew simulation](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChomeworkBoss%5Cracingcrew6-9.htm)[Thinning of arriving entities](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChowtoBoss%5CTypicalBossCommands.htm#thinning)[EXITLOGIC](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChowtoBoss%5CExitlogic%5Csimple_exitlogic_example.htm) (simple example)[EXITLOGIC](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass28%5CELTruck.htm)Saving simulation results to disk with histograms and distributions[BOSS exam practice problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass28%5CPracticeBoss.htm)[Solutions to BOSS practice problems](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5CClasses%5CClass28%5CBossSolutions.pdf) | Homework: Thoroughly understand what we did in class today and be ready to answer similar questions on the final exam.Pick up any unreturned homework in front of my office door next Monday morning, or later. |
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|   |   | **CVEN 322 Sec 502Final Exam held in CE Room 110 on Friday December 10th, 2010, 3:00-5:00 pm. Covers everything in the course, with emphasis on BOSS.****CHECK THIS DATE AND TIME FOR ACCURACY AT:**[**University Final Exam Schedules**](http://admissions.tamu.edu/registrar/General/FinalSchedule.aspx) | The [Final Exam](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CHumor%5CpearlsHitByBus.gif) covers everything in the course with emphasis on BOSS. You are permitted to bring the following materials only: [Typical BOSS Commands](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChowtoBoss%5CTypicalBossCommands.htm) hand-out sheets including the example problems that are printed in that set of notes, and your [FE Engineering Exam Review Manual](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CFEReviewManuals%5CEconomics.pdf). |

\* Revelle text - this is required reading, either from the Revelle text or from an equivalent text. If you do not have the Revelle text, but have some other engineering economics textbook, that will suffice. Just study the same material as listed in our book, as specified above
\*\* Revelle text - reading materials used to supplement class lectures only. **NOT REQUIRED READING**.
\*\*\* [A complete BOSS user's manual is available as a .pdf file by clicking here](file:///C%3A%5CUsers%5Clowery%5CDocuments%5CMy%20Documents%5ChowtoBoss%5CBOSSall.pdf)

**The following is the required ADA statement.**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

**The following is the required Academic Integrity Statement**

 ***“An Aggie does not lie, cheat, or steal or tolerate those who do.”***

All syllabi shall contain a section that states the Aggie Honor Code and refers the student to the Honor Council Rules and Procedures on the web: <http://www.tamu.edu/aggiehonor>