

CE 410W: Sustainable Residential Land Development

Fall Semester, 2006

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Text and Reference Materials:

- T.R. Dion, P.E., L.S., *Land Development for Civil Engineers*, Second (or most current) Edition, John Wiley & Sons, New York, New York, 2002. (1)
- Finkelstein, Ellen, *AutoCAD 2005*, Bible, Hungry Mings, Inc., New York, New York, 2005. (or any other AutoCAD reference) (2)
- Zimmerman, Phillip J., *Harnessing AutoCAD Land Development Desktop 2005*, AutoDesk Press, Albany, New York, 2005 (or other land desktop reference) (2)
- Rosen, Gary S., *Learning Land Desktop 2005*, The Goodhart, Willcox Company, Inc., Tinley Park, Illinois, 2005. (2)
- SCS TR55, Small Watershed Hydrology (3)
- HDS-5: Hydraulic Design of Highway Culverts – 1985 (3)
- HEC-22: Urban Drainage Design Manual – 2001 (3)
- *Autodesk Land Desktop in a Nutshell*, Training Video by Gary Rosen. (On the CAD LAB Server)
- *Autodesk Civil Design in a Nutshell*, Training Video by Gary Rosen. (On the CAD LAB Server)

(1) Required Text

(2) Suggested Reference documents.

(3) Reference document – Available for download at

<http://www.wcc.nrcs.usda.gov/hydro/hydro-tools-models-tr55.html> click on “TR-55 Documentation”; Other course reference materials will be posted under the appropriate Lessons Tab in ANGEL.

Prerequisite: AE 372 Introduction to the Building Industry, or
CE 332 Construction Project Development, and
Seventh-semester standing in AE of CE.

Course Description:

The course is designed for seniors and graduate students in Civil and Architectural Engineering interested in learning the principles of residential design and development. The course covers the subdivision and land development regulatory process, zoning issues, and all elements of civil infrastructure design required in the residential land development process. Conservation design and sustainable development techniques are emphasized throughout the course.

For effective residential subdivision design, students must be proficient in applying basic principles of mathematics, science, and economics included in accredited academic engineering programs. An understanding of design software and its application has also become an integral part of the land development design process. The course discusses the scope and nature of the

residential land development process. Students will be expected to perform design and analysis necessary for appropriate subdivision layout and infrastructure design. Students will be introduced to several design and analysis software packages during the course. Issues in engineering ethics and professional responsibility related to land development are interwoven into class discussions and assignments.

During the first five (5) weeks of the semester students will work individually to complete various assignments. The purpose of these assignments is to give students an introduction to the elements of design, and exposure to the process of conveying their design through the preparation of construction drawings. During this first phase of the course students will also be required to attend a municipal board meeting and report on projects presented at that meeting.

For the final ten (10) weeks of the course, the class will be divided into 3 person teams to work on the semester project. Each team will be required to prepare a subdivision conceptual layout using conservation design techniques, and then use engineering methods and practices to design the necessary site geometry and infrastructure. The final project deliverable will be a set of construction drawings and engineering calculations supporting subdivision and infrastructure design. Groups will be expected to make two formal presentations during the semester; one at the completion of the conservation design phase; and the second at the completion of the semester project.

The pace of the course is brisk, and **lectures will not include detailed coverage of all necessary engineering methods and practices.** Students are expected to independently learn design methods in areas where their background is currently insufficient (very much like the real world). The course text is an excellent land development design reference; other resources will be suggested during the course.

Students will prepare construction drawings for the assignments and the semester project using the AutoCAD and Land Desktop software available on the server in the computer lab. Software is also available in the computer lab to assist with stormwater management and conveyance design. Some instruction in the use of these industry standard software packages will be provided. However, efficient use of these complex engineering tools will require significant effort on the part of the student. The level of effort necessary to complete the necessary designs using these tools is expected in this course.

Work on the semester project should be divided equally team members. A final statement of group member participation will be required as a part of the final submission. This statement will need to be signed by all group members. Group participation will be considered as a weighting to a students final grade.

Course Grading

Course grading will be will be as follows:

Individual Assignments (30%)	
Sustainable Development Paper	3%
AutoCAD and Site Inventory	5%
Public Meeting Minutes / Report	4%
Zoning and Subdivision Assignment	5%
Grading and Road Design Assignment	13%
Final Project (70%)	
Weekly Project Updates	5%
Concept Design (Plan and presentation)	10%
Construction Plans (Plans only)	20%
Engineering Calculations	25%
Final Presentation	10%

All written materials must be professional and grammatically correct. Graphic presentation must be clear, understandable, and professional. Seventy percent (70%) of the grade for each assignment will be based on technical merit and accuracy. Thirty percent (30%) of each assignment grade will be based on format and presentation quality.

Projects must be submitted by the due date. However, one free late assignment (other than the final project submissions) will be permitted. Individual assignments turned in late, will receive three-quarter credit (score times 0.75 = assignment grade). **No credit will be given for work turned in later than three non-holiday week-days after the due date.** Grading will be in accordance with the following guideline:

An "A" project or assignment will be one that demonstrates a complete understanding of the design and development process, shows originality, and includes clear and professionally written and graphic presentation. A "B" effort is one that meets all requirements, but may be lacking in some aspect such as originality, design detail, presentation (graphic or written), or professionalism. A "C" effort is one that demonstrated an understanding of the design procedures and processes, but exhibits some technical deficiencies. A failing grade will be received if portions of assignments or the project are incomplete and do not warrant consideration as professional work.

Grade Disputes:

If a student feels that an assignment was graded unfairly, or if there was an error in the grading, it should be brought to the instructor's attention within one week after the graded material is returned to the student. Scores will not be reconsidered beyond this one week window.

Academic Integrity Policy

Cheating and other forms of academic dishonesty will not be tolerated. Cheating and academic dishonesty are grounds for dismissal from the class.