# October 22, 2013

# CE 2010

**CIVIL ENGINEERING TECHNIQUES**

Fall 2013

TR 9:30 – 10:45

MEC 205

**Course Description**

The purpose of this course is to introduce and familiarize students with fundamental knowledge and skills necessary for civil engineering project design, construction, maintenance, and operation. The course focuses on three areas: surveying, geographic information systems and computer-aided design/modeling. Particular emphasis will be placed on providing hands-on experience with the latest equipment, software, and technology used in the profession.

# Course Objectives

The course objectives for CE 2010 are as follows:

To develop basic proficiency in surveying and geomatics

To develop basic skills in computer-aided design/modeling

To develop basic skills in geographic information systems

**Instructor**

Brian L. Smith

Department of Civil and Environmental Engineering

Thornton B-228

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Office Hours: Mondays 2:00 – 3:00

Wednesdays 11:30 – 1:00

**Teaching Assistants**

Ben Felton brf2er@Virginia.EDU

Alexandra Todd alt5ry@Virginia.EDU

Civil 3D/Survey/GIS Help Sessions: Mondays 7:00 – 8:00 pm

Wednesdays 7:00 – 8:00 pm

Help Sessions will be held in Thornton D-107

**Texts**

*Surveying: Principles and Applications,* 9th Edition. Barry Kavanagh and Tom Mastin. Pearson, Inc. 2014.

*AutoCAD Civil 3D 2010 Education Curriculum*. Available at students.autodesk.com

**Home Page**

The primary means of communication and information dissemination for the course will be through the course collab course site. The course schedule, lecture notes, example problems, homework assignments, homework solutions, and announcements will be posted to the website. In addition, many announcements will be made via e-mail. Students are expected to check their e-mail and collab regularly.

**Grading**

Test #1 15%

Test #2 15%

Surveying HW 20%

Field Surveying/GIS/3D Modeling Exercises 25%

Final Exam 20%

Quizzes/Participation 5%

**Course Policies**

1. Attendance at all lectures is expected.
2. Quizzes are unannounced.
3. Homeworks are to be turned in prior to the beginning of lecture. No late homework will be accepted.

**The Honor System and the School of Engineering and Applied Science**

The School of Engineering and Applied Science relies upon and cherishes its community of trust. We firmly endorse, uphold, and embrace the University’s Honor principle that students will not lie, cheat, or steal, and we expect all students to take responsibility for the System and the privileges that it provides. We recognize that even one Honor infraction can destroy an exemplary reputation that has taken years to build. Acting in a manner consistent with the principles of Honor will benefit every member of the community both while enrolled in the Engineering School and in the future.

**SCHEDULE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Topic** | **Reading** | **Survey/Econ**  **HW** | **Field Survey/**  **3D Model / GIS** |
| Aug 27 | Course Introduction |  |  |  |
| Aug 29 | Surveying Fundamentals | Surv Ch 1 |  | 1 – kml |
| Sept 3 | Surveying + Stationing | Surv Ch 1 | A |  |
| Sept 5 | Leveling | Surv Ch 2 |  | 2 – 2D |
| Sept 10 | Distance Measurement | Surv Ch 3 | B |  |
| Sept 12 | Angle Measurement | Surv Ch 4 |  | 3 – 3D |
| Sept 17 | Traverse Surveys | Surv Ch 6 | C |  |
| Sept 19 | Traverse Surveys | Surv Ch 6 |  | 4 – Points |
| Sept 24 | Contemporary Instruments | Surv Ch 5&6 | D |  |
| Sept 26 | Test #1 |  |  |  |
| Oct 1 | Intro to Geographic Info Systems | Surv 9 |  | 5 – Surface |
| Oct 3 | Satellite Positioning | Surv Ch 7 |  |  |
| Oct 8 | Intro Sem. Project + Satellite Positioning | Surv Ch 7 | E | *Survey Lab* |
| Oct 10 | Satellite Positioning Field Data Collection | Surv Ch 7 |  | 6 – Surv Data |
| Oct 15 | Reading Day |  |  |  |
| Oct 17 | Topographic Surveying | Surv Ch 8 |  |  |
| Oct 22 | Creating Maps with GIS | Surv Ch 9 |  | 7 – GIS I |
| Oct 24 | Advanced Satellite Positioning Concepts | Surv Ch 7 |  | 8 – GIS II |
| Oct 29 | Control Surveys | Surv Ch 10 | F |  |
| Oct 31 | Control Surveys | Surv Ch 10 |  | 9 – Alignment |
| Nov 5 | Highway Alignment/Curves | Surv Ch 13 | G |  |
| Nov 7 | Sustainable Stormwater Design |  |  | Project A - Geodatabase |
| Nov 12 | Aerial Imagery | Surv Ch 12 |  |  |
| Nov 14 | Test #2 |  |  |  |
| Nov 19 | Map Workshop |  |  | 10 – Sustainable Design |
| Nov 21 | Satellite Imagery | Surv Ch 11 | H |  |
| Nov 26 | LiDAR + Construction Survey | Surv Ch 13 |  | Project B – GIS Deliverables |
| Nov 28 | Thanksgiving |  |  |  |
| Dec 3 | Civil 3D Review/Demo |  |  |  |
| Dec 5 | Design Workshop |  |  | Project C – Design |
|  |  |  |  |  |
| Dec 9 | Final Exam  2:00 – 5:00 |  |  |  |