

**COURSE NAME:** AECT 360 – Structural Theory and Applications

**CREDIT HOURS:** 4; 3 - 1 hr. lectures per week  
1 - 3 hr. lab per week

**INSTRUCTOR:** D. Hultenius, Smith Hall Room 113   **PHONE:** 746-4081  
**e-Mail:** hultendc@.delhi.edu                   **FAX:** 746-4126  
**Web Page:** <http://faculty.delhi.edu/hultendc/>  
**Office Hours:** See Web page

**PREREQUISITES:** 1) AECT 150 - Statics & Strength of Materials (or equiv.)  
2) Computer fluency including Internet, e-mail, 2-D AutoCAD, 3-D CAD, Spreadsheets and Word Processing

**COURSE OBJECTIVES:**

1. Know and understand the fundamental principles of Structural Engineering.
2. Be able to analyze and determine any of the various types of loads typically applied to building structures, including live, dead, wind, snow and seismic.
3. Be able to analyze and design structural components of buildings using wood, concrete, masonry and steel framing members. Usage of various computer software and Internet research.
4. Become familiar with structural design provisions of various Building Codes.

**TEXTS:** 1. AECT 360 Lecture Notes, by David C. Hultenius, Campus Bookstore.  
2. International Building Code 2009, International Code Council

**GRADING:** Three (3) unit tests.....25% (No test grades dropped)  
Weekly and unannounced quizzes.....15% (**ONE** quiz grade dropped)  
Lab assignments/homework.....25% (**ONE** grade dropped)  
Lab Final Project.....25%  
Final Exam.....10% (Waived for "A" students)  
Total = 100%

## **POLICIES:**

1. **ATTENDANCE**: Students are expected to attend ALL required lectures and ALL required labs, and attendance WILL be taken at each. Quizzes, homeworks or other assignments missed will be given a grade of zero, no exceptions. A test may, at the discretion of the instructor, be made-up under extreme circumstances only. Unless prior written arrangements are made with the instructor and/or University-approved absences are provided, a grade of "F" for the course will be assigned if 7 or more hours of lectures and/or labs are missed. Lateness and/or being unprepared for class will not be tolerated as it is disruptive and inconsiderate. Repeat violators will be dropped from the course.
2. **CHEATING**: You are encouraged to work and study with other students in the class, especially on group assignments. However, you are ultimately responsible for your own work, and it is usually quite evident who is "copying" from whom. Any individually assigned graded work that is discovered to be a "carbon copy" of another student's work will result in ALL parties involved receiving a zero for that particular test, quiz or homework. Computer assignments (involving CAD, spreadsheets and/or other analysis) must be wholly completed by each individual student - i.e., NO sharing of ANY electronic data. Repeat violators will be given an "F" for the course and be referred to the Department Chair for further action.
3. **OUTSIDE HELP**: Please make every effort to see me for additional help if, at any time, you feel you need some further clarification or review of the subject matter. Do not let yourself get too far behind; I am here to help you.
4. **INTERNET USAGE**: It is assumed that a basic understanding of the Internet exists. **It is your responsibility to check the instructor's course Web site daily.** From time to time, homework assignments will involve referencing the instructor's course web page and transmitting the completed assignment back to the instructor via e-mail. In addition, some homework assignments may involve searching for information on the Internet utilizing various methods.

## ***AECT 360 Course Outline: (tentative)***

<b>AECT 360 – Structural Theory</b>	
<b>Lecture:</b>	<b>Topic*:</b>
1	Introduction, course info., review of units
2	Forces, resultants
3	Beams - reactions, shears, moments
4	Section Properties - area, centroid, moment of inertia, sect. mod., etc.
5	Section Properties - moment of Inertia of non-symmetric shapes
6	Section Properties - composite shapes
7	Stress-strain relationships, modulus of elasticity, simple stresses
8	Stresses - shear and bending
9	Poisson's ratio, toughness, creep, fatigue, thermal stresses
10	Torque and torsion
11	Deflections, combined stresses
12	<b>Test 1 *</b>
13	Friction - retaining walls
14	Arches
15	Negative bending & continuous beams
16	Frame analysis
17	Frame analysis - approximate methods
18	Truss analysis
19	Truss analysis (cont.)
20	Computer structural analysis
21	Intro. to the International Building Code (IBC)
22	IBC - Building dead loads, live loads, reduction factors, load combinations
23	IBC - Snow loads
24	IBC - Wind loads
25	IBC - Wind loads (cont.)
26	IBC - Seismic principles
27	IBC - Seismic loads
28	<b>Test 2 *</b>
29	Timber design - beams
30	Timber design - columns
31	Timber design - connections
32	Steel design - tension members and beams
33	Steel design - columns
34	Steel design - connections
35	Concrete design - beams and slabs
36	Concrete design – continuous slabs & beams, columns
37	<b>Test 3 *</b>
38	Lateral force resisting systems - braced members
39	Lateral force resisting systems - shear walls
40	Lateral force resisting systems - diaphragms
41	Structural systems & engineering practice
42	<b>Comprehensive Final Exam</b>
	* = Tentative, subject to change