State University of New York
College of Technology at Delhi, NY
Spring 2012

COURSE NAME: ARCH 220 – Commercial Detailing

CREDIT HOURS: 3; 2 - 1 hr. lectures per week
1 - 2 hr. lab per week

INSTRUCTOR:

D. Hultenius
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PHONE: (607)746-4081
e-mail: hultendc@delhi.edu **Web Site: http://faculty.delhi.edu/hultendc/**

PREREQUISITE: ARCH 110 – Residential Drawing, strong AutoCAD knowledge

COURSE OBJECTIVES:

1. Understand commercial building systems; including masonry, precast concrete, steel, cast-in-place concrete and pre-engineered buildings.
2. Be able to layout and draw commercial building working drawings; including sections, plans, elevations and details.
3. Reinforce and further develop quality CAD skills required in the design office.
4. Productive usage of Google SketchUp 8 software for creation of 3D details
5. Introduce Autodesk Architecture for use in drawing production.
6. Introduce Autodesk "Revit Architecture" for use in 3D design.

REQUIRED TEXT:

- Ramsey and Sleeper, *ARCHITECTURAL GRAPHIC STANDARD* Student Edition, (Abridgment of the Eleventh Edition), Wiley.
- Lecture notes available on instructor's Web site

SUPPLIES: 1 GB (min.) USB portable storage device(s)

GRADING:

Weekly Drawings.....……..65% (**See Policies below**)
Weekly and unannounced quizzes...20% (**ONE** quiz grade dropped)
Attendance/Participation……..5%
Final Exam……10%
Total = 100%

POLICIES:

1. ATTENDANCE: Participation is mandatory for ALL lectures and ALL labs, and attendance WILL be taken, (taken at beginning AND end of Labs). 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. Full credit will be awarded for "Attendance/Participation" if 3 or fewer hours of lectures and/or labs are missed, no credit will awarded if 4 or more missed hours of lectures and/or labs. Quizzes missed will be given a grade of zero, no exceptions. Only one 10-15 minute break will be permitted during the Lab period. Lateness and/or being unprepared WILL NOT be tolerated as it is disruptive and inconsiderate. Repeat violators will be dropped from the course. Absolutely NO cell phones allowed at any time in class – a grade of ZERO will be given if a cell phone is used during any quiz or test.

2. DRAWINGS: There will be approximately 12 assigned drawings during the semester (floor plans, sections, elevations, details and isometrics). This will be a CAD oriented drawing course, and ALL assigned drawings MUST be drawn entirely using CAD, and a grade of ZERO will be assigned to drawings that are NOT DRAWN ENTIRELY ON CAD. Each drawing will be one week in duration and will be DUE NO LATER than 30 minutes after the beginning of the next Lab period, after which it will receive a grade of ZERO. Students are allowed a one-time allowance for turning in a single drawing assignment at any time during the duration of the semester with no penalty IF accompanied by a written explanation explaining the circumstances. Students who turn in NO zero grade drawings during the entire semester will have their lowest drawing grade dropped and shall receive a bonus of 2 points added to their final grade. It is the **student's sole responsibility** to take ALL ACTIONS NECESSARY to prepare the required CAD drawings, i.e., learn the software, keep data safe, allow adequate computer & plotting time, etc. so that completed drawings are plotted and turned in prior to the due times and dates. Additionally, special grading policy will begin effective with the second assignment. See Web site for details.

3. CHEATING: First time violators will be given a warning and a grade of zero for that particular quiz or drawing FOR ALL PARTIES INVOLVED. A second offense will be immediately constitute an "F" for the course and referred to the Provost for further disciplinary action. Cheating includes copying or "sharing" or "working together" of any or all of another person's electronic or written work with or without the other person's knowledge or consent. Everybody is strongly encouraged to keep computer files safe and inaccessible to others, i.e., do not leave drawing files on the CAD lab computer hard drive.

4. 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. It is HIGHLY recommended that you have your drawing checked prior to turning in for grading. A tutor may be available during the semester, and it will become the student's sole responsibility to obtain such help, if, in fact, a tutor does become available.

ARCH 220 COURSE OUTLINE:

UNIT I – Typical Commercial Building Systems

Objectives:

1. Understanding of typical commercial building components and terminology.
2. Knowledge of typical commercial building construction details.
3. Determination of advantages and disadvantages of various building systems.
4. Understanding of commercial building construction procedures.
5. Ability to intuitively assemble typical commercial buildings on paper.
6. Gain efficiency in drawing production using manual drafting and computer aided drafting methods.

Content:

A. Footings and Foundations

1. Types and uses of various footings and foundations
   a. Wall footings
   b. Column footings
   c. Pier and pile footings
   d. Walls and grade beam foundations
   e. Details of reinforcement

2. Types and uses of various concrete slabs on grade
   a. Floating slab
   b. Structural slab
   c. Slab joints (control, construction, etc.)
3. Drawing assignment - details of footings, foundations and slabs

B. Concrete Masonry Unit (CMU) Construction

1. Material composition and fabrication
2. CMU accessories
   a. Horizontal wire joint reinforcing
   b. Vertical reinforcing
   c. Masonry ties
   d. Control joints
   e. Flashing
3. CMU assembly and integration with other systems
   a. CMU - to - brick
   b. CMU - to - steel
   c. CMU - to - concrete
4. Drawing assignment - CMU wall section

C. Steel Construction

1. Typical steel framing members
   a. “W” shapes
   b. Pipes and tubes
   c. Channels
   d. Angles
2. Steel connections
   a. Bolted connections
   b. Welded connections
3. Steel bar joists
   a. Typical joist members and components
   b. Connection of joists to other members
   c. Joist accessories
4. Assembly of components
   a. Erection of building
   b. Infill wall components (curtain walls, CMU, etc.)
5. Drawing assignment - Structural steel and bar joist wall section

D. Cast-in-place Concrete Construction

1. Concrete materials and fabrication
   a. Cement
   b. Aggregates
   c. Water and admixtures
   d. Batching and mixing
2. Concrete framing members
   a. Beams
   b. Columns
   c. Slabs
3. Concrete reinforcement
   a. Sizes
   b. Placement
4. Erection and assembly of concrete members
   a. Formwork and shoring
   b. Infill walls
   c. Integration with other components (steel, CMU, etc.)
5. Drawing assignment - Cast-in-place concrete wall section

E. Precast Concrete Construction

1. Materials and fabrication
   a. High-strength concrete
   b. Pretensioning
   c. Posttensioning
2. Precast concrete framing members
   a. Slabs (solid, hollowcore)
   b. Beams (“T”, “Double-T”, “I”)
   c. Columns
   d. Walls and panels
3. Connection of precast members
   a. Weld plates
   b. Reinforcing and grout
   c. Bolted connections
4. Drawing assignment - Precast concrete wall section

F. Pre-engineered Steel Building Construction

1. Types of pre-engineered steel building systems
   a. Rigid frame
   b. Post and beam
   c. Lean-to
2. Pre-engineered steel building components
   a. Bents and frames
   b. Purlins
   c. Girts
   d. Sag rods and bracing
   e. Wall panels
   f. Connections, insulation and miscellaneous components
3. Drawing assignment - Rigid frame pre-engineered building wall section & details

UNIT II – Commercial Building Project

Objectives:

1. To prepare a basic set of working drawings for a typical commercial building.
2. Understanding the integration of building components to the complete building.
3. Emphasis of correct dimensioning, drawing and labeling techniques.
4. Production of portfolio set of drawings for future reference.

Content:

A. Commercial Site Plans

1. Elements of a Site Plan
   a. Legal Boundaries
   b. Zoning requirements
   c. Topography (existing and proposed)
   d. Natural physical features
   e. Constructed structures
   f. Utilities
   g. Roads
   h. Parking layout
   i. Landscaping
2. Drawing assignment - Commercial Site Plan

B. Foundation/First Floor Plan

1. Outline of footings
2. Exterior wall layout and dimensions
3. Interior walls and partition layout and dimensions
4. Structural and equipment layout
5. Stair layout
6. Labels and notes

B. Second Floor Plan

1. Exterior wall layout and dimensions
2. Interior walls and partition layout and dimensions
3. Structural and equipment layout
4. Stair layout
5. Labels and notes

C. Building Section

1. Exterior wall and foundation construction
2. Floor construction
3. Roof construction
4. Interior wall construction
5. Heights and elevations
6. Labels and notes

D. Elevations

1. Exterior wall construction
2. Outline of footings
3. Heights and elevations
4. Labels and notes

E. Stair Details

1. Enlarged stair plan and dimensions
2. Stair cross-section and details
3. Correct handrail, riser & tread dimensions
4. Heights and elevations
5. Labels and notes