FALL 2014

Course Syllabus

CAD 210–01
RESIDENTIAL AND COMMERCIAL DRAFTING WITH CADD
3 Semester Hours

Faculty: Donald Nicholson, Technology Department Head
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Office Hours: By Appointment

Class Time:  CAD 210 Lecture: Independent Study Monday 2p.m. -5 p.m.
CAD 210 Lab: Thursday Independent Study 2p.m.-5 p.m.

Course Description
This course covers the geometrical, aesthetic, functional, environmental, historical, and construction-related aspects of preparing design and construction documents using CADD for building projects. Drawings are made for light commercial and residential construction, including project assembly techniques, building materials and assemblies, problem solving, site plans, floor plans, building elevations, building and wall sections, electrical and mechanical systems, and construction schedules. Two lecture hours and three laboratory hours per week. Prerequisite: CAD 150. Corequisite: CON 150, MFG 150 or permission of the department head. Usually offered in the fall.

Course Materials
Software: AutoCAD 2015 or Revit 2015 (Students are not required to purchase)
Additional Materials: Laboratory exercises will be supplemented with instructor provided materials.

COURSE OBJECTIVES, ASSESSMENT GOALS, AND ASSESSMENT STRATEGIES

Course Fundamentals

The focus of this course is the development of a holistic understanding and approach to architectural/engineering drafting. Students will be encouraged to consider the methodology associated with the preparation of design and construction drawings in a professional setting.
Students will gain an understanding of the professional environments in which they will be working and the key professionals and personnel that comprise the typical design team. Knowledge of the entire process provides and overall working context and perspective on the importance of individual tasks that are typical for any building project.

Material presentation will stress the importance of conceptual thinking and understanding. It is imperative that students begin to develop clear thinking skills: critical (evaluating the existing), analytical (problem solving), conceptual (understanding underlying principals), and graphic (exploring metal concepts and conditions through visual means).

Learning Objectives

In this course, students will:

1. **Describe the professional environments where CADD is used.**
   a. Discuss the career opportunities available in the various architectural and engineering settings.
   b. List the phases of a typical building design and construction project, and explain considerations.
   c. Differentiate between the different roles and responsibilities of the designer, architect, engineer, and draftsperson.
   
   *Assessment Strategy: Required internet research project, exam questions, quizzes and homework.*

2. **Demonstrate an understanding of the CADD environment.**
   a. Compare the traditional manual drafting techniques to CADD and explain the importance of CADD to architectural/engineering drafting.
   b. Enumerate and explain the function of the components that constitute a CADD workstation – computer, software, layout work surface, plotters, and printers.
   c. Explain the difference between traditional and B.I.M. (Building Information Modeling) programs.
   
   *Assessment Strategy: Required internet research project, exam questions, quizzes and homework.*

3. **Develop skills based upon CADD practices in the professional environment.**
   a. Describe the importance of drafting standards (such as the National CAD Standard (NCS) and AIA CAD Layer guidelines) and demonstrate discipline in drawing creation.
   b. Create a drawing using “paper” space and “model” space.
   c. Establish a base drawing using the XREF command, and use a base drawing in multiple “sheet” drawings.
   
   *Assessment Strategy: Laboratory work, exam questions, quizzes and homework.*
4. Develop a familiarity with Construction Documents.
   a. Differentiate between the types of construction drawings.
   b. Identify and utilize key drawings elements: lines, text symbols, and abbreviations.
   c. Discuss and practice dimensioning within drawings.

   Assessment Strategy: Laboratory work, required final project, exam questions, quizzes and homework.

5. Understand the importance of architectural floor plans.
   a. Discuss and identify the purpose and key features of floor plans.
   b. Discuss and identify the general sizes and drawing conventions of walls, doors, windows, cabinets, fixtures and appliances, stairs, fire places, and other elements found in the various rooms of a building.
   c. Utilize the process of CADD to draft a floor plan; including exterior and interior walls with appropriate thickness, lay out doors, windows, cabinetry, appliances, plumbing fixtures, fireplaces, and stairs.

   Assessment Strategy: Laboratory work, required final project, exam questions, quizzes and homework.

6. Understand the importance of exterior elevations and roof plans.
   a. Describe the process of drafting elevations in CADD and the typical methods of exterior elevation layout and drafting techniques.
   b. Articulate the importance of developing the roof design (shape/pitch) together with the exterior elevations.
   c. Compose a roof plan and exterior elevations developed from a given floor plan(s), complete with material designations displayed through the use of “hatching” in CADD.

   Assessment Strategy: Laboratory work, required final project, exam questions, quizzes and homework.

7. Understand the importance of section drawings.
   a. Differentiate between the three types of sections used in construction documents: full (building), partial (wall), and details.
   b. Identify factors that influence the choice of section scales and levels of drawing detail; indicate drafting conventions used for showing section cutting planes on plans and elevations.
   c. Compose a building and wall section developed from a given floor plan(s) and exterior elevations; indicate building components and materials using standard hatch patterns; properly dimension, and letter and compose identification notes; use standard symbols to indicate cutting plan on related floor plan.

   Assessment Strategy: Laboratory work, required final project, exam questions, quizzes and homework.
8. **Understand the importance of building codes and regulations.**
   a. Explain the building code groups and define their purpose.
   b. Describe the major facets of a building that the codes govern.
   c. Explain the necessity of working closely with the building codes when designing and drafting a building project.
   *Assessment Strategy: Laboratory work, exam questions, quizzes and homework.*

9. **Develop an understanding of drafting for commercial applications.**
   a. Describe how commercial projects require different office practices from residential projects.
   b. List and explain the types of drawings included in a commercial construction project.
   c. Identify the major differences between commercial and residential floor plans according to materials and building systems used, and the extent to which schedules, notes, and symbols are employed; describe the floor plan symbols and schedules used for commercial structures.
   *Assessment Strategy: Laboratory work, exam questions, quizzes and homework.*

   [Addresses GEO 8]

**Course Topics**

Architectural/Engineering drafting encompasses a myriad of skills. True mastery of the material only comes through your of practice and exposure. This course will attempt to outline the overall subjects and activities important to a beginning CADD draftsperson. Topics covered include:

1. **Professional Environments**
   a. Roles of architects, engineers, consultants, and draftspersons.
   b. Responsibilities, duties, and necessary skills of draftspersons.
   c. Building Team: Owners, Design Professionals, and Contractors.
   d. Phases of the building design and construction project.
   e. Career opportunities and various work settings.

2. **CADD Practices in the Profession**
   a. CAD standards and symbols.
   b. Project organization.
   c. Working with layers, symbols, and object groups.
   d. “Paper” and “model” space in drawings.
   e. Using XREF reference files.
3. Understanding Construction Documents
   a. Necessity and purpose of construction documents.
   b. Types of construction documents and document sequencing.
   c. Elements of a drawing.
   d. Common symbols and abbreviations.
   e. Drawing scale and standard sheet sizes.

4. Architectural Floor Plans
   a. Purpose and key features for floor plans.
   b. Building elements: walls, doors, windows, cabinets, fixtures, stairs, etc.
   c. Drawing elements: symbols, labels, titles, annotations, etc.
   d. Drawing layout and scale.
   e. Appropriate leads and line weights.
   f. Dimensioning standards and drawing conventions.

5. Architectural Roof Plans and Exterior Elevations
   a. Relationships between floor plan, roof plan, and elevations.
   b. Typical layout methods for roof plans and elevations.
   c. Exterior building envelope and fenestration (doors, windows, trim elements, etc.).
   d. Exterior materials and “hatch” patterns.
   e. Roof shapes and pitch calculations.

6. Section Drawings
   a. Types of sections: building, wall, detail.
   b. Drafting conventions for section drawings.
   c. Drawing scale and level of detail.
   d. Drafting of building components, material designations, dimensions, and annotations.

7. Building Codes and Regulations
   a. Building Code groups (zoning, building, fire) and purpose.
   b. Major facets of building codes.
   c. Construction documents and the codes.
   d. Occupancy classifications.
   e. Permitting process.

8. Commercial Projects
   a. Differences between residential and commercial projects.
   b. Types of drawings for commercial projects.
   c. Floor Plan conventions for commercial projects.
   d. CADD implementation for commercial projects

Course Format and General Comments

Depending on the nature of the material, the lecture/lab format may be altered due to this independent study format.
The classroom will setting will ideally approach a “studio” environment in which theory and practice overlap and are explored both individually and within a group setting.

Students should recognize the importance of their learning resources. Architectural/Engineering draftspersons do not work in an isolated setting; it is important to develop strong communication skills.

What each student learns will be a direct result of his or her effort in the learning process. Those willing to put forth the necessary effort will leave this course with a set of skills that will make him or her a valuable asset in the workplace.

**Course Requirements and Policies**

**Attendance**

Attendance at all lectures and laboratory periods is mandatory. If a class is missed, it is the student’s responsibility to determine course material covered in the missed class and attend the next class prepared to participate actively. Lectures may or may not present information available from the readings. Students will be held accountable for any information presented in independent study class.

Absence from a quiz or test will result in a grade of zero (0). However, if absence is due to mitigating circumstances, as determined by the instructor, a make-up test or quiz may be taken. Missed labs must be coordinated with the instructor.

**Evaluation, Grading, & Exams**

Evaluation will be made primarily on the quality of each student’s work. Drawings will be graded on required information, drafting discipline, neatness, and technical accuracy. However, since most students are encountering a great deal of information and techniques for the first time, special consideration will be given to individual effort.

Time management is critical to the profession; missed deadlines are unacceptable. This course will also stress the importance of proper time management. Accordingly, late course assignments will not be accepted. Incomplete work will be greatly penalized.

Most work done in the lab will be due at the end of the period. However, recognizing that some students are not as CAD-proficient as others, there will be a “grace period” for projects of greater difficulty. The policy is as follows: assignments eligible for a grace period will be indicated as such before or during distribution. Projects submitted after this time will not be accepted and will receive a zero (0).
Overall grades will be determined on the basis of tests, drawing assignments, homework assignments, quizzes, and final exam as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>30%</td>
</tr>
<tr>
<td>Average of two quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Research/Writing Project</td>
<td>10%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Labs/ drawing assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Final Project</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Conversion of numeric average to final (letter) grade:

- 90 - 100 = A
- 80 - 89  = B
- 70 - 79  = C
- 60 - 69  = D
- 0 - 59   = F

**Academic Honesty**

Academic honesty is expected of all students. Cheating and plagiarism are violations of academic honesty. If academic honesty is suspected, a student may receive a failing grade on a test or quiz. Discussion will occur before penalties are given. Purposeful dishonesty may be reported to the Student Conduct Committee (see Student Catalog). Students may appeal any penalty through the Student Conduct Committee. Cheating occurs when one uses deceitful means to cheat, e.g. crib notes, copying or imitating the language and ideas of another, without footnoting, and presenting them as one’s own work, e.g. copied papers, abstracts, sections of books, etc.

**Cell Phone/Pager Requirement**

Upon entering either lecture or lab, the student will turn his/her cell phone, PDA or pager off or place the device on “silent” mode.

**ELECTRONIC LAB ASSIGNMENT**

The Electronic Lab Assignment (ELA) will be assigned at the first class meeting. You will be assigned a topic and a due date at that time. You are responsible to complete this assignment on time and failure to do so may result in lowered course grade. ELA is a requirement for all courses by Wor-Wic Community College.

If you need help in writing your ELA, please utilize the writing center at Wor-Wic. You can schedule an appointment online. Go to the Wor-Wic Web Site at [www.worwic.edu](http://www.worwic.edu) and the Click
on Current Students. Then select Learning Resources and the Writing Conferences. Limited time slots are available so an appointment is required.

**H1N1 STATEMENT FOR SYLLABUS**

In the event of a flu epidemic or other emergency that results in the suspension of classes, faculty will be communicating with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via faculty websites or Blackboard. Students will be responsible for completing all these assignments in accordance with class policies. Information about the resumption of classes will be communicated via the College's website and email system.

**Required statement concerning use of academic integrity and computer usage policy:**

All students logging into Blackboard affirm that they understand and agree to follow Wor-Wic Community College policies regarding academic integrity and the use of College resources as described in the college catalog. Wor-Wic Community College considers the following as violations of the computer usage policy:

- Using the campus computing network and facilities to violate the privacy of other individuals.
- Sharing of account passwords with friends, family members or any unauthorized individuals

Violators are subject to college disciplinary procedures.