Spring 2008

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Office hours posted on my office door and lab bulletin board, or other times by appointment

Course Title: Process Piping/Plant Design

Course Number: DDT 218 - Process Piping/Plant Design

Course Credit: 3 semester hours (2 hours lecture, 2 hours lab per week)

Class Meeting Time: 1:00-2:50 Monday and Wednesday

Class Location: Lecture and Lab will meet in Room 220 Anzalone Hall

Prerequisite: DDT 211 - Process Pipe Drafting Technology.

Course Description: The general concepts and principles of process plant layout and design, including plant layout specifications, equipment and component arrangement, basic stress analysis while using 3-D parametric plant design software.


Knowledge Base:
- ASME B31.3-2004 Process Piping, American Society of Mechanical Engineers, 2004
- NAVCO Piping Datalog, 11th edition, 2005
- The Piping Guide: For the Design and Drafting of Industrial Piping Systems, David Sherwood and Dennis Whistance, Synetke, Inc. 2000
- Ullmann's Chemical Engineering and Plant Design, 2 Volume Set, CHIPS Publishers, 2005

Course Requirements: The student should:
1. read assigned sections in the text and be prepared for class.
2. attend class, arrive on time and sit in designated seat.
3. become involved in the class and participate in discussions.
4. devote necessary time to complete assigned work
5. complete all work in a professional manner.
6. be prepared for unannounced quizzes.
7. adequately study for tests and the final exam.
8. provide the required drafting equipment.
9. keep back-up copies of all assignments on Net Storage
10. follow lab rules & guidelines
CAD Applications Lab Computer Use Guidelines
1. Back up your work often
2. Label and remove your flash drive/diskette
3. Clean the desk and your work area before your leave.
4. DO NOT save anything to the hard drive or desktop, it will be automatically deleted.
5. DO NOT reconfigure the computer settings (screen savers, etc.)
6. Use plot preview before printing
7. DO NOT “surf” inappropriate internet sites
8. Downloading of music, games, software, etc. is strictly prohibited.
9. Plot Power Point presentations 6 per page – not full size
10. Do not turn off computers, except at the end of the day.
11. Return everything to its’ proper place
12. Report broken or damaged equipment immediately.
13. At the log-in screen, press enter (DO NOT change user name)

Special Provisions:
If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services, Room 203, Student Union. No accommodations will be granted without documentation from the office of Disability Services.

Email Contact:
You may contact me at my campus email anytime, I check it several times daily. I will respond to your email within one working day. Any email correspondence I send you will be via your official university email.

Attendance Policy:
This is an interactive class, much of the material presented will be drawn from a variety of current sources, therefore your presence for the entire class is essential. The classes are one hour and 50 minutes long and you are expected to be present the entire time. Arriving late and leaving early are unacceptable. Attendance will be taken daily, and you will be marked absent if not in attendance for the full class.

You are responsible for dropping this class, if you so desire -- you will not be automatically dropped for failure to attend class! When a student drops a class or resigns from the University on or before the designated drop deadline, the appropriate grade shall be “W.” Students who remain in the course after the deadline will receive the appropriate grade as assigned by the instructor based on work done in the course.

Policy on Make-Up Work:
A student with an unexcused absence may not make up work missed. A grade of zero will be recorded for work missed during the absence period. A student with an excused absence has one (1) week after returning to class to make-up work missed and earn full credit.
Classroom Decorum:
Please do not walk in and out of the class during lectures. If you arrive late, enter by the rear door and be seated as discreetly as possible. The classroom is not a place for children and students are not to bring their family members to class.

Free discussion, inquiry and expression is encouraged in this class. The experiences of all students can be beneficial if they can be intertwined within the course content. However, classroom behavior that interferes with either a) the instructor’s ability to conduct the class or b) the ability of students to benefit from the instruction is not acceptable. Examples may include: routinely entering class late or leaving early; use of pagers, cellular telephones or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is perceived as “crossing the civility line.” The classroom is not a place for children, therefore do not bring them to class with you.

Class Work:
You will not be able to complete all assigned work during class time. You should plan to spend about 1-1½ hours outside of class for each hour of class. I caution each of you not to “fall behind schedule” on your drawings; it is imperative that drawings be submitted on time. Late work will have one letter grade deducted for each class that the work is late.

The Tech Fee drafting lab in room 216 Anzalone is open approximately 20 hours per week (consult the schedule on the door for open hours).

Academic Honesty:
Students are expected to maintain the highest standards of academic honesty. Behavior that violates these standards are not acceptable. Cheating on or communicating with other students during examinations, plagiarism, improper acknowledgment of sources in essays, attempting to benefit from the work of other students, or the use of a single essay or paper in more than one course without permission are considered very serious offenses and shall be grounds for disciplinary action as outlined in the current General Catalog. Students agree, that by taking this course, all papers submitted may be subject to electronic plagiarism detection using Turnitin.com. All papers will be included as source documents in the Turnitin.com database for the purpose of detecting plagiarism of such papers.

Grading: The final letter-grade you receive in this course is my verification or assessment of the degree of functional mastery you have achieved.

Basis for assigning grades:
- Four Tests: 35%
- Final Exam: 10%
- Weekly Quizzes: 10%
- Lab Activities: 10%
- Assigned Drawings: 15%
- Class Presentation: 5%
- Major Group Project: 10%
- Attendance: 5%

Departmental Grading Scale:
- 93% -100% = A
- 85% - 92% = B
- 77% - 84% = C
- 69% - 76% = D
- Below 69% = F
Equipment Provided by the Student:

1. Binder or folder to store drawings/worksheets
2. Jump drive storage
3. Notebook
4. 8½ x 11 grid sketch paper
5. Circle template
6. Mechanical pencil

Important Dates:

- January 22 . . . . . . . . First day of class Spring 2008
- February 4-5 . . . . . . . Mardi Gras Holiday (Monday & Tuesday)
- February 6 . . . . . . . . Classes resume at noon
- March 14 . . . . . . . . . Last day to withdraw or resign from regular classes
- February 15 . . . . . . . Last day to file for Spring 2008 Graduation & Summer 2008 without penalty
- March 3 . . . . . . . . . Advising begins for Early Registration
- March 17-20 . . . . . . . Early Registration for Summer 2008
- March 21-28 . . . . . . . Spring Break
- Mar 31- Apr 4 . . . . . Early Registration for Fall 2008
- May 9 . . . . . . . . . Last day of class

Thursday, May 15th, 2:45 pm - Final Exam

Course Outline:

1. Paradigm Shift in the Design/Engineering of Process Plants
2. Piping codes, standards and specifications
3. Phases of a plant layout project
4. Design, fabrication, assembly and erection
5. Materials used in process piping systems
6. Basic Plant Arrangement and Layout
7. Plant Layout Specifications
8. Plant Process Unit Plot Plans
9. Piping Systems and Details
10. Piping Fabrication
11. Compressors
12. Process Vessels & Drums
13. Exchangers
14. Furnaces and Heaters
15. Pumps and Turbines
16. Reactors
17. Towers
18. Pipe Racks and Supports
19. Structures
20. Underground piping
21. Instrumentation
22. Storage Tanks
23. Stress Analysis
24. Inspection and Testing
25. Computer-Aided Design and modeling
26. Extracting and organizing data from 3-D model
Course Competencies: As a result of this class, the students will:

1. Use generally accepted practices to route, support and assure pipe stays within an existing layout
2. Identify basic process equipment, pipe, valves, and fittings from either photographs, drawings or generally accepted 2D and 3D symbols and identifies their nozzles and other points of connection and attachment.
3. Trace out, sketch and correctly identify process lines on the Process Engineer’s P&ID and on a corresponding 2D or 3D representation (Piping Isometrics, Plans, Sections, Renderings) and verify their correctness.
4. Identify and list the proper materials for a given piping specification.
5. Identify situations requiring the application of publicly available piping design standards, including ASME B31.3, B31.1 and API 1104.
6. Design pipe appropriately to commonly available fabrication and erection methods.
7. Design pipe to accommodate reasonably foreseeable inspection and maintenance practices.
8. Use a Computer Aided Design (CAD) system to correctly represent a schematic and dimensioned piping drawings and backup electronic client appropriately.
9. Seek out appropriate technical expertise when required.
10. Identify the impact on piping design of plant unit start-up, shutdown, and normal operation including thermal expansion, contraction and their control.
11. Recognizes the need for and gather the appropriate information before work begins, including:
   a. P&IDs.
   b. PFDs.
   c. Vessel Outlines.
   d. Equipment Data Sheets.
   e. Recognize survey needs.
   f. Required existing underground, background or reference drawings.
   g. Piping Specifications, Piping Standards.
   h. Client CAD requirements.
   i. Safety requirements.
   j. Environmental requirements.
   k. Budget and schedule requirements
12. Recognize complete sets of data needed for work to be deemed complete.
14. Extract data needed to develop and produce the following items:
   a. Piping bill of material
   b. Piping Isometrics,
   c. Line List,
   d. Specialty Item List,
   e. Tie-In List,
   f. Stress Isometrics,
   g. Known pipeline spans,
   h. Pipe support requirements,
   i. Pipe rack loading and other design requirements.
15. Demonstrate good intra-discipline communication skills

Course competencies taken from the Society of Piping Engineers and Designers Level I (Basic) and Level II (Advanced) Professional Piping Designer certification requirements