Introduction To Industrial & Process Construction

CNST 1325

GENERAL:
Course Instructor: David Stayshich
Course Time: Friday 4:00 – 7:00 PM
Office Hours: By appointment, Email through Blackboard,
Office location: 111 T1
Contact Information: 281-263-2522

COURSE DESCRIPTION:
This course is intended to be an overview of Industrial & Process Construction. The course will introduce the students to various heavy construction projects including but not limited to refinery construction, chemical plant construction, power plant construction, mine processing facilities, airports, heavy highway construction including bridges, pharmaceutical plants, assembly plants, public transportation, microelectronics plants, and others.

CLASS OBJECTIVE
After completion of the course the student will:
1. Understand the various types of industrial and process construction projects
2. Understand how to perform excavation, place concrete, and backfill for heavy industrial projects
3. Understand piping/process systems including how to read piping flow sheets and how to put together test packages
4. Understand how industrial construction projects estimate their work
5. Learn how industrial projects contract work and procure equipment and materials
6. Learn how to safely perform an industrial project
7. Learn how industrial projects staff personnel and hire craft

In addition to the learning objectives above, this course emphasizes Ethics, Safety, and Oral/Written Communication.

PRE-REQUISITE COURSES:
The following three courses are pre-requisites or can be taken concurrently with this course: CNST 1315, CNST 1330 and CNST 1361.

TEXTBOOK:
Process Technology Equipment and Systems by Charles E Thomas. Textbook is optional. No quiz/exam questions will be taken from the textbook.

CLASS STRUCTURE:
· 20% for attendance
· 25% for final exam
· 20% for quizzes
· 10% for journals
· 15% for assignments
· 5% for assignment participation
- 5% for HSE topic

**SCHEDULE OF TOPICS**

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<th>Week</th>
<th>Lecture Topics</th>
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| 1 | Introductions: Class objectives, Class outline, Class schedule  
    Class rules  
    Projects: Petrochemical, Power, Highway/Civil, Mining, Pharmaceutical,  
    Microelectronics, Factories, Government work  
    Project Flow: Proposals, Bids, Studies, Front-End Engineering and Development  
    (FEED), Front-End Loading (FEL), Engineering, Procurement, Construction,  
    Turnover and Start-up, Operations & Maintenance |
| 2 | Project Controls & Change Management: PowerPoint presentation, Estimating,  
    Changes  
    Project Document & Data Management: PowerPoint presentation, Description of  
    Flow of Documents, Types of Documents, Changes/Revisions |
| 3 | **Field Trip #1 – CP Chem Site Visit, Baytown, QUIZ #1** |
| 4 | Civil Assignment (Teams): Lay out foundation, Excavate, Form, Place Concrete,  
    Backfill, Structural, Structural components  
    **Assignment #1** |
| 5 | • Contract Management: PowerPoint presentation, Contracts with Clients,  
    Contracts with Subcontractors, Types of Contracts, Lump Sum, Cost  
    Reimbursable, Cost Plus Fee, Cost Plus Incentive  
    • Estimating, Safety |
| 6 | **Field Trip #2-Fluor Offices, Sugar Land**  
    • How a Refinery Works: Guest Speaker  
    • Welding: PowerPoint Presentation, Overview of Construction Welding,  
    Welding Processes, AISC Structural Welding, Pipe Welding (API, AWS,  
    AWWA)  
    • Non Destructive Examination: PowerPoint Presentation, Types of NDE (PT,  
    RT, MT, VT, UT)  
    **Turn in & Review Assignment #1** |
| 7 | **TURN IN JOURNALS**  
    • Electrical: One Line Diagrams, Equipment, Installation  
    • Instrumentation: Instrument P&ID’s, Instrument List, Instrument Drawings,  
    Instrument Photos  
    **QUIZ #2** |
| 8 | Piping Assignment (Teams): Lecture, Class assignment, Reading P&ID’s,  
    Reading isometric drawings, Comparing P&ID’s & Iso’s  
    **Assignment #2**  
    Spring Break Mar 20 |
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<th>Week</th>
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| 9    | • Quality Control: PowerPoint Presentation, Reasons for QC, Types, Areas  
      • Mechanical/Equipment: Lecture, Description of various types of mechanical equipment  
      * Turn in Assignment #2  
      * QUIZ #3 |
| 10   | • Ethics  
      • Procurement /Material Management  
      • Mechanical Completion: Turnover, Commissioning, Start-up |
| 11   | Rigging Assignment (Teams): Lecture(Cranes, Rigging), In Class Assignment, Use crane & rigging to lift a piece of equipment  
      * Assignment #3 |
| 12   | **Field Trip #3 Mammoet Yard, Rosharon, Tx** |
| 13   | • Modular Construction: PowerPoint presentation, Reasons for modular construction, Examples, types, Red Dog Mine Video  
      • Labor : Types of labor, Union, Open shop, Merit shop  
      • Project Workflow, Construction Engineering, Duties & Responsibilities, Types of Construction Engineers  
      • Site Management  
      • Site organization  
      • Field operations departments  
      * Turn in & Review Assignment #3  
      * QUIZ #4 |
| 14   | Mechanical Construction  
      Sustainability  
      • PowerPoint presentation  
      • Sustainability concepts for construction  
      Constructability |
|      | **Final Exam – May 8 (tentative)**  
      Final Exam  
      * TURN IN JOURNALS |

**QUESTIONS:**
Each student should review the syllabus and email the instructor any questions that need to be clarified. It is important that each student understand the class structure and requirements. Adjustments to the class may be made during the semester.

**ACADEMIC HONESTY:**
Each student is responsible for maintaining high standards of academic honesty and ethical behavior. Students are expected to take their exams, quizzes, and reports on their own, based on their individual effort. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the University.
(See Student Handbook for a detailed description of the UH Academic Honesty Policy).

**STUDENTS WITH DISABILITIES:**
University of Houston provides, upon request, appropriate academic adjustments for qualified students with disabilities. Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Center for Students with Disabilities (713-743-5400) for more assistance.

**EXAM POLICY:**
Exams and quizzes will include material covered in the class discussions and homework assignments. Exam make-up will be given only in the event of a verified hospital emergency or proof that you were in jail. The student is responsible for all reading assignments and class handouts whether or not covered in class or listed on the syllabus.

**COURSE/INSTRUCTOR EVALUATION:**
A Start-Stop-Continue survey and a course/instructor evaluation will be conducted at the middle and the end of the semester. Any suggestions you have on improving the course, however, are welcome through the semester.

For detailed information Academic Honesty Policy, UH Academic Calendar, students with disabilities, and other information, please visit the following website:
http://www.uh.edu/provost/stu/stu_syllabsuppl.htm1