

Course Syllabus – CNST 1325

Process and Industrial Construction

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.

Course Pre-Requisites:

Credit for or concurrent enrollment in CNST 1361 and CNST 1315 or CNST 1330.

Textbook:

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

Course Learning Outcomes:

After completion of the course the student will:

1. Understand the various types of industrial and process construction projects (SLO#20)
2. Understand how to perform excavation, place concrete, and backfill for heavy industrial projects (SLO#8)
3. Understand piping/process systems including how to read piping flow sheets and how to put together test packages (SLO#7)
4. Understand how industrial construction projects estimate their work (SLO#7)
5. Learn how industrial projects contract work and procure equipment and materials (SLO#12)
6. Learn how to safely perform an industrial project (SLO#15)
7. Learn how industrial projects staff personnel and hire craft (SLO#7)

Student Learning Outcomes:

7. Analyze construction documents for planning and management of construction processes
8. Analyze methods, materials, and equipment used to construct projects
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
15. Understand construction quality assurance and control.

Course and Student Learning Outcome Mapping:

Student Learning Outcome	Course Learning Outcomes
20	1
8	2
7	3, 4, 7
12	5
15	6

Student Learning Assessment and Assessment Target:

Assessment	SLO#7	SLO#8	SLO#12	SLO#15	SLO#20	Assessment Target
Support (S)	X		X		X	At least 70% of students receive a grade of 70 or better
Assess(S)		X		X		At least 70% of students receive a grade of 70 or better

Class Grading:

	<ul style="list-style-type: none"> ○ Description of Flow of Documents ○ Types of Documents ○ Changes/Revisions <p>Safety Constructability QUIZ #1</p>
Week 3	<p>Civil Assignment (Teams)</p> <ul style="list-style-type: none"> ● Class assignment <ul style="list-style-type: none"> ○ Lay out foundation ○ Excavate ○ Form ○ Place Concrete ○ Backfill <p>Structural</p> <ul style="list-style-type: none"> ○ Structural components <p>Assignment #1</p>
Week 4	<p>Contract Management</p> <ul style="list-style-type: none"> ● PowerPoint presentation <ul style="list-style-type: none"> ○ Contracts with Clients ○ Contracts with Subcontractors ○ Types of Contracts <ul style="list-style-type: none"> ▪ Lump Sum ▪ Cost Reimbursable ▪ Cost Plus Fee ▪ Cost Plus Incentive <p>Estimating QUIZ #2</p>
Week 5	<p>AWP Presentation AWP QUIZ</p>
Week 6	<p>Mechanical/Equipment</p> <ul style="list-style-type: none"> ● Lecture <ul style="list-style-type: none"> ○ Description of various types of mechanical equipment ● Mechanical Construction
Week 7	<p>Piping Assignment (Teams)</p> <ul style="list-style-type: none"> ● Lecture ● Class assignment <ul style="list-style-type: none"> ○ Reading P&ID's ○ Reading isometric drawings ○ Comparing P&ID's & Iso's <p>Assignment #2 TURN IN JOURNALS <i>Turn in & Review Assignment #1</i></p>
Week 8	<p>Welding</p> <ul style="list-style-type: none"> ● PowerPoint Presentation <ul style="list-style-type: none"> ○ Overview of Construction Welding <ul style="list-style-type: none"> ▪ Welding Processes ● AISC Structural Welding ● Pipe Welding (API, AWS, AWWA) <p>Non Destructive Examination</p> <ul style="list-style-type: none"> ● PowerPoint Presentation

	<ul style="list-style-type: none"> • Types of NDE (PT, RT, MT, VT, UT) <p>Quality Control</p> <ul style="list-style-type: none"> • PowerPoint Presentation <ul style="list-style-type: none"> ○ Reasons for QC <ul style="list-style-type: none"> ▪ Types ▪ Areas
Week 9	<p>Ethics</p> <p>Procurement /Material Management</p> <p>Mechanical Completion</p> <ul style="list-style-type: none"> ○ Turnover ○ Commissioning ○ Start-up <p>Electrical</p> <ul style="list-style-type: none"> ▪ One Line Diagrams ▪ Equipment ▪ Installation <p>Instrumentation</p> <ul style="list-style-type: none"> ▪ Instrument P&ID's ▪ Instrument List ▪ Instrument Drawings <p>Instrument Photos</p> <p>Sustainability</p> <ul style="list-style-type: none"> • PowerPoint presentation • Sustainability concepts for construction <p><i>Turn in & Review Assignment #2</i></p> <p>QUIZ #3</p>
Week 10	<p>Rigging Assignment (Teams)</p> <ul style="list-style-type: none"> • Lecture <ul style="list-style-type: none"> ○ Cranes ○ Rigging • In Class Assignment <ul style="list-style-type: none"> ○ Use crane & rigging to lift a piece of equipment <p>Assignment #3</p>
Week 11	<p>Modular Construction</p> <ul style="list-style-type: none"> • PowerPoint presentation <ul style="list-style-type: none"> ○ Reasons for modular construction ○ Examples, types <p>Red Dog Mine Video</p> <p>Labor</p> <ul style="list-style-type: none"> • Types of labor <ul style="list-style-type: none"> ○ Union ○ Open shop ○ Merit shop <p>Project Workflow</p> <ul style="list-style-type: none"> • Construction Engineering <ul style="list-style-type: none"> Duties & Responsibilities Types of Construction Engineers • Site Management

	<ul style="list-style-type: none"> • Site organization • Field operations departments QUIZ #4
Week 12	Field Trip #1 to Stork or Offshore Museum ACCE Accreditation Progress QUIZ – Construction Quality
Week 13	Field Trip #2 to S&B Site <i>Turn in & Review Assignment #3</i> ACCE Accreditation Progress QUIZ – Construction Methods
Week 14	Thanksgiving Holiday
Week 15	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).

Exam Policy:

Exams and quizzes will include material covered in the class discussions and homework assignments. Exam make-ups 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.

The last day of class is the deadline for students to verify their grades and the accuracy of their score. After this deadline, there will be no consideration for any changes.

Class Rules:

- Be prompt to class. We will start on the hour at 4:00PM. A 10 minute break will be given when convenient.
- No make-up tests will be allowed for the final exam.
- Assignments will be due on the dates listed. A reduction in grade will be assessed for late assignments.
- For each field trip you **do not** attend you will be penalized TEN (10) points on your final grade
- You will be required to provide your own transportation for the field trips and encouraged to do car pools
- Each class will begin with an HSE topic to be given by different students each week. Instructor will give the topics the first day of class.
- Instructor will provide a Value Creation topic at the beginning of each class
- Maintain a Journal every class and take notes.

Attendance:

You are responsible for the information presented in class and meeting all due dates regardless of absences. This class requires good note taking since the PowerPoint presentations are only an outline of the lecture. 20% of your final grade will be attendance. **You will be considered absent if you arrive in class after the safety topic has begun. DO NOT come into class when a student is giving their HSE presentation.** Wait until they are finished before finding your seat.

NOTE: Lecture notes will be posted on Blackboard the week-end after each Friday class.

Final Exam:

The final exam will be comprehensive multiple choice and will be administered through Blackboard. Questions will be from lectures, HSE topics and value creation topics. You will be allowed to bring anything except electronic devices as aids for taking the final. No make-ups are allowed.

Quizzes:

Four multiple choice quizzes will be given during the semester through Blackboard. The student will be given 10 minutes to take the quizzes. The window for taking the quizzes will be after class and will be open until midnight of the following Sunday. No make-ups are allowed.

Journals:

Each student is to maintain a journal. At **each class meeting** the student is to enter the following information into the journal on a new page:

- Date
- Weather
- HSE Topic discussed
- Value Creation topic discussed
- Class notes

Mid-semester and during the final exam the teacher will look at everyone's journal and provide comments. You will be graded on the neatness of your journal including printing and note taking abilities.

Assignments:

Assignment 1 – A civil assignment will be handed out to each team in class and directions will be given on how to complete the assignment. Each team will spend the remainder of class starting the assignment and will continue working on it outside of class. The assignment will be turned in two weeks after it has been handed out.

Assignment 2 – A piping assignment will be handed out to each team in class and directions will be given on how to complete the assignment. Each team will spend the remainder of class starting the assignment and will continue working on it outside of class. The assignment will be turned in two weeks after it has been handed out.

Assignment 3 – A rigging assignment will be handed out to each team in class and directions will be given on how to complete the assignment. Each team will spend the remainder of class starting the assignment and will continue working on it outside of class. The assignment will be turned in two weeks after it has been handed out.

Assignment Participation - It is expected that each team member will participate in preparing the assignment. Your team members will grade you on your participation in all three assignments combined

University Counseling and Psychological Services:

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (UH main campus www.uh.edu/caps, or UH Sugar Land campus <http://www.uh.edu/dsaes/uhsugarland/>)

by calling [713-743-5454](tel:713-743-5454) during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the “Let's Talk” program, a drop-in consultation service at convenient locations and hours around campus.

UH main campus: http://www.uh.edu/caps/outreach/lets_talk.html

UH Sugar Land campus: <http://www.uh.edu/dsaes/uhsugarland/>

Classroom Behavior:

High level of professionalism in the classroom is expected. The instructor has the right to set the rules in his/her classroom. A student does not have the right to make changes to the instructor's way of managing the classroom. Disruptive behaviors, such as excessive talking, arriving late to class, and using unauthorized electronic devices during class is not permitted. Repetitive and seriously disruptive behavior may result in removal from class in accordance with policies and procedures set by the Dean of Students Office.

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.

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.

For detailed information about Disabilities, Religious Holy Days, the Academic Calendar, and Academic Honesty, and other information, please visit the following website: <http://www.uh.edu/provost/policies/student/resources/>