



Houston Community College
Global Energy Training Institute
Northeast College
Northeast –Campus

Syllabus: Spring 2020

PTAC 1302 - Introduction to Process

LECTURE LOCATION: Houston Community College, Northeast Campus

North Forest Campus Room: TBA

SECTION: 17781

CREDIT HOURS: 3.00

CLASS TIME: Saturday, 8:00 AM-10:50 PM

Course Description

PTAC 1302 - Introduction to Process Technology Introduction to chemical and refinery plant operations. Topics include process technician duties, responsibilities and expectations, plant organizations, plant process and utility systems, and the physical and mental requirements of the process technician. Credit: 3 (3 lecture)

Prerequisites

Prerequisite or Corequisite: None

Course Goals (includes competencies, incorporation of SCANS, etc.)

(NAPTA) RECOMMENDED LEARNING OUTCOMES

1. Students will identify and describe the various process industries and the roles, responsibilities, and expectations for the process technician.
2. Students will be able to identify and describe basic equipment used in process industries.
3. Students will be able to describe the importance of quality, safety, health and environment to the process industry.
4. Students will be able to read and interpret basic process industry drawings.
5. Students will demonstrate the ability to apply basic concepts of Chemistry and Physics within process industries.

The Process Technology program at Houston Community College Northeast is an associate member of North America Process Technology Alliance (NAPTA) <http://test.naptaonline.org/index.php> . Process Technology program at HCC-NE complies with NAPTA recommended course outcomes http://test.naptaonline.org/app/learning/topics_objectives.

Instructor Information

Dr. G. Solomon Osho

Professor, Global Energy Institute

Houston Community College Northeast

555 Community College Drive, Suite 100 STECH, Houston, Texas 77013

Telephone: (713)718-5200 Support Staff (713)718-5534 (HCC Mail Code: 1449-337)

Email: gbolahan.oshol@hccs.edu

Program Outcomes

Students will be able to

- Describe operation of process control equipment such as an analyzer, control loop, transducer, transmitter, detector, flow indicator, pressure alarm, Pressure control valve, and recorders.
- Operate process systems and equipment.
- Describe safety, health, and environmental standards in the plant.
- Troubleshoot process abnormalities and equipment malfunctions.
- Explain operation of plant systems and equipment.
- Analyze plant reaction systems.
- Demonstrate maintenance procedures in process systems and equipment.

Course Outcome

Upon completion of this course, the student will be able to:

1. Describe the roles, responsibilities, safety, environmental, and quality concepts associated with the work environment of a process
2. Identify basic processes, equipment and
3. Define and apply terms and symbols needed in the processing

Textbook Information

Introduction to Process Technology, 2nd Edition Pearson ISBN 978-0-13-480824-6

Policies

ADA Policy

If you have any special needs which affect your ability to learn in this class, please inform me. Appropriate steps will be taken to assist you with your needs. Any student with a documental disability (physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the ADA counselor at the beginning of each semester. There is a Disability Support Services Office at each campus. To find the name of the ADA counselor at your campus, visit www.hccs.edu, then click future students, scroll down the page and click on the words Disability Information. Faculty members are authorized to provide only the accommodations requested by the Disability Support Services Office.

Title IX of the Education Amendments

Title IX of the Education Amendments of 1972 requires that institutions have policies that protect students' rights with regard to sex/gender discrimination. Information regarding these rights are in the HCC website under Students-Anti-discrimination. Students who are pregnant and require accommodations should contact any of the ADA Counselors for assistance.

Student Rights and Responsibilities

It is important that every student understands and conforms to respectful behavior while at HCC. Sexual misconduct is not condoned and will be addressed promptly. Know your rights and how to avoid these difficult situations.

Log in to www.edurisksolutions.org Sign in using your HCC student e-mail account, then go to the button at the top right that says **Login** and enter your student number.

Scholastic Dishonesty

HCCS students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by HCC System officials against a student accused of scholastic dishonesty.

"Scholastic dishonesty" includes, but is not limited to, cheating on a test, plagiarism, and collusion. Cheating on a test includes but is not limited to: Copying from another student's test paper; using unauthorized materials during a test, unauthorized collaboration with another student during a test; knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of a test; and bribing another person to obtain a copy of a test. Plagiarism includes the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work. Collusion includes the unauthorized collaboration with another person in preparing written work.

Attendance

Students are expected to attend theory lectures, participate in tests, practical or examinations and perform their laboratory tasks when necessary. Any student, who is absent more than 12.5% of the class and lab combine, will be automatically withdrawn from the course. See the student handbook, Course Schedule, or Catalog for details. Drops and withdrawals are the student's responsibility. (The instructor will not be responsible for drops or withdrawals).

I will not drop you from this class but please know your exam and quiz grades tend to reflect your attendance. As reading the book alone is not enough to do well in this course.

You are expected to attend class and participate in the class discussions. As well as arrive on-time, and stay throughout the class. ***Attendance will be taken every single class*** It is your responsibility to sign in every day.

Withdrawals

Students who take a course for the third time or more must now pay significant tuition/fee increases at HCC and other Texas public colleges and universities. At HCC, it is an additional \$50 per credit hour. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/ counselor as early as possible about your study habits, reading and writing homework, test-taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.

Repeating Courses

As a result of recent Texas legislative changes, please be advised that HCC is charging additional tuition for students who enroll in the same class three or more times at HCC. While it is the hope of HCC that students will be successful in their first attempt at classes, we realize that life demands, academic struggles, and other issues may result in students needing to take the same class more than once. Speaking with an advisor will help you develop student success skills, improving your overall academic performance. If a student repeats a course in which a grade (A-F) has been received, the highest grade received at HCC is the permanent grade for the course and will be used in computing the GPA. All grades earned in a given course will be reflected on the transcript. Other colleges may compute the GPA differently than HCC.

HCC Student Handbook

Please note that it is each student's responsibility to read and be familiar with the HCC Student Handbook. Please see:

<http://central.hccs.edu/students/student-handbook/>

Additional Course Information

I will offer tutoring during the week days by appointment (email me to set this up) or stop by during my office hours. I will also offer a tutoring session (for those who are interested) that will go further in depth before each exam, and allow you to ask any questions you may have. These sessions will not take place unless requested, and occur at the Codwell campus.

Computers and Phones

I allow computers and tablets for note taking purposes, but once this privilege is abused, I reserve the right to no longer allow computers in class. Cell phones and texting will not be tolerated in class under

any conditions. Use of recording devices, including camera phones and tape recorders is prohibited in classrooms, laboratories, faculty offices, and other locations where instruction, tutoring, or testing occurs.

Learning Web

Course materials will be posted on Learning Web and on (Canvas) found on the HCC homepage.

Academic Honesty

The Process Technology Department and specifically this instructor, follows the HCCS policies on scholastic dishonesty, which includes, but is not limited, to cheating on a test, plagiarism, and collusion. See the HCCS student handbook for a more detailed explanation.

HCC Public Emergency Plan

Every member of the Houston Community College community should understand his or her role in emergency situations. All faculty, staff, and students should review this plan so they can support their colleagues should an emergency arise.

Evacuation routes and assembly areas are posted throughout the campus(s). If you are faced with a situation that requires evacuation, proceed in an orderly fashion to the designated assembly area. If a situation arises that requires you to shelter-in-place, you will be given instructions to proceed to a designated area, do not leave the building.

In Case of Emergency Dial 911 or call HCC Police at 713-718-8888 for faster dispatch time. To update your emergency contact information, log into PeopleSoft on the Student Sign-Ins page. The "Run. Hide. Fight." Videos provide the information you need to survive an active shooter event.

Please follow the link for more information;

<http://www.hccs.edu/district/departments/police/crime-prevention--safety/hcc-public-emergency-plan/>

Discrimination

Students should be aware that discrimination and/or other harassment based on race, sex, gender identity and gender expression, national origin, religion, age, disability, sexual orientation, color or veteran status is prohibited by HCC Policy G.1 Discrimination and Harassment and D.1.1 Equal Educational Opportunities. Any student who feels they have been discriminated against or harassed on the basis of race, sex, gender identity, gender expression, national origin, religion, age, disability, sexual orientation, color or veteran status including sexual harassment, has the opportunity to seek informal or formal resolution of the matter. All complaints/concerns should be directed to the Office of Institutional Equity, 713 718-8271 or oie@hccs.edu. Additional information may be obtained online. Visit

<http://www.hccs.edu/district/departments/institutionalequity/>

Complaints involving sexual misconduct to include but not limited to: sexual assault, stalking, dating violence, sexual harassment or domestic violence should be directed to the HCC Title IX Coordinator, Renée Mack at 713 718-8272 or renee.mack@hccs.edu

EGLS3 – Evaluation for Greater Learning Student Survey System

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.

Makeup policy (Absent on test day or project due day Policy)

Avoid being absent on test day or project due days. Taking makeup test or turning in projects late (after test day or project day) must be approved by instructor otherwise zero score will be awarded for the missed work. Emergency cases must be communicated. Support documents must be provided for

emergency cases (accidents, hospitals/health, mandatory deployment, and anything that is beyond student's control; non-repeating; non-planned). Note: Students are required to demonstrate ethics, genuine intention, and respect for studying in engineering technology programs (this course). Students must (are required) to do their best to avoid absenteeism and taking make-ups. See Guide Sheet for Emergency Support Document and acknowledgement letter for late or missed assignment at the end of this document. Instructor reserves the right to judge what is considered an emergency or simple disrespect for the course, team, and professional ethics for Engineering Technology at HCC-Northeast.

Last Day for Administrative and Student Withdrawals

After the withdrawal date (see current semester academic calendar www.hccs.edu) no W can be given, you must receive a regular grade (A-F) in the course. I urge any student who is contemplating withdrawing from the class to see me first! You may be doing better than you think. It is your responsibility to withdraw by that date if you have missed a lot of class work. Remember you are to turn in all assignments on the due date.

Course Requirements and Grading Policy

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

Grades will depend on the following:

- Test1=15% of final grade
- Test2=15% of final grade
- Test3=15% of final grade
- Test4=15% of final grade

Tests are 60% of final (class) grade.

Class projects/assignments are 40% of final (class) grade

Scantrons, #2 Pencils, and textbook are required for each test. See scantron information at the end of this syllabus.

PTAC 1308 presentation (oral communication) grading criteria

Presentation	Clarity Level	Organization	Conclusion
	Speaks clearly to audience (Introduce Yourself & subject of presentation)	Speaker conveys points intended to (avoids unnecessary details that may confuse audience or reading from notes)	Speaker makes Conclusion of presentation or answers questions If applicable
Total points 100	33.3/100	33.3/100	33.3/100

Class Schedule

Read chapters and do assignments to show mastery of course objectives listed below. Instructor will announce homework assignment in class.

Course Work

1. Introduction
 1. Introduction of faculty and students
 2. Review Syllabus
 3. Review Class Policies

2. Process Technology- Overview
 1. Process industries
 2. Process technology
 3. Operator duties.
3. Oil and Gas Industry
 1. History of oil and gas
 2. Duties of oil and gas
 3. Role of operator.
4. Chemical Industry
 1. History of chemical
 2. Duties of chemical
 3. Role of chemical
5. Other Types of Industry using Process Operators
 1. Description of other
 2. Duties of
 3. Role of operator.
 4. Relationships of physical properties of matter.
 5. Application of chemistry to the petrochemical industry.
6. Safety, Health, Environment
 1. Quality
 2. Terms & issues
 3. Hazards
 4. Workforce diversity
 5. Process drawings-P&ID's
7. Piping and Valves, Pumps, Compressors
 1. The purpose of piping and
 2. The purpose and function of pumps in the process
 3. The purpose and function of compressors.
8. Turbines, Electricity and Motors
 1. Purpose and function of steam turbines.
 2. Purpose and function of electric motors.
9. Heat Exchangers and Cooling Towers
10. Purpose and function of heat exchangers.

Purpose and function of cooling towers.

1. Furnaces and Boilers
 1. Purpose and function of fired heaters in the process
 2. Purpose and function of boilers
2. Distillation
 1. Types and functions of distillation units.
 2. Process of distillation in relationship to finished
3. Process Utilities and Axillaries
 1. The different process utilities and their relationships to process production.
 2. The purpose and function of flare, refrigeration, lubrication, and hot oil systems.
4. Instrumentation
 1. Process instrumentation, their purpose and their

Course Schedule (Subject to Change)

Week	Topic	Reference
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1-2	Course Orientation – Introductions, Syllabus, Learning Environment Orientation. Chapter 1-9 – Process Technology	Syllabus Introduction Quiz
3	Basic Physics	Chapter 10 Assignment 1 Discussion 1
4	Basic Chemistry **TEST 1 – Chapter 1-11	Chapter 11
5	Safety, Health, & Environment, Quality	Chapter 12,13 Assignment 2 Discussion 2
6 Teams, P&ID's **TEST 2 – Chapters 12-15	Chapters 14,15	
7 Piping & Valves	Chapter 16	
8 Vessels, Pumps and Compressors **TEST 3 – Chapters 16-19	Chapter 17,18,19 Assignment 3	
9 Turbines	Chapter 20 Discussion 3	
10 Electricity& Motors **TEST 4 - Chapters 20-21	Chapter 21	
11 Heat Exchangers	Chapter 22	
12 Cooling Towers **TEST 5 - Chapters 22-23	Chapter 23 Assignment 4	
13 Furnaces	Chapter 24	
14 Distillation	Chapter 25	

	Discussion 4	
15 Boilers **TEST 6 – 24-26	Chapter 26	
16 Finals Week	Chapters 1- 26	

Assignments and Assignment Rules:

Class will be divided in groups (teams) for the duration of the semester. Each student in class will be part of a team for the duration of the semester. Each team will have identification (example, last name of team leader). Students in each team will participate in selecting a Team Leader (TL) and an assistant to the team leader in case of emergencies and absence of TL.

TL and ATL will receive up to 40 points due to time required for managing the teams depending on the size of the team and quality of reports turned in.

All students in a team must communicate effectively amongst themselves and organize a system of providing work/report needed for the team's grade (refer to GRADING section on what % of your grade comes from team participation, so please participate). Team's grade will be recorded for each member of the team and therefore it is strongly recommended that all team reports include a sample from each member indicating his/her contribution (hand written or typed with team ID, project ID, student name, and date). If a team member does not provide proof of contribution (evidence of timely self-work and effective communication with ethical considerations) that member will not get team's grade and 0 will be recorded for the member.

All reports (team or each member self-work) will have a title section with the teams ID, each member's name. See sample Title Page and Guide Sheet on last page of this document. TL turns in the team's project for grading. Each team is required to do presentations to the class. All teamwork projects/papers must have Title Page (see last page of this document). See disaster lists for Process and Oil/Gas on learning web for this course. If team report does not include member self-work that member will receive 0 for assignment. Late evidence of self-work will not be accepted. Support documentation will be required for emergency cases. Instructor reserves the right to determine emergency cases. Late work may be judged as disrespect for the course, the team, and to the professional ethics for Engineering Technology at HCC-Northeast. So, do not miss turning in your evidence of self-work to your TL. Instructor will occasionally check with team to evaluate cooperation of members. If team reports lack of interest, late self-work, unethical behavior then the team member will receive 0 for the assignment. See Guide Sheet for Emergency Support Document and acknowledgement letter for late or missed assignment at the end of this document. Instructor reserves the right to judge what is considered an emergency or simple disrespect for the course, team, and professional ethics for Engineering Technology at HCC-Northeast.

1-Assignment ONE (non-presentation teamwork due by week #2 from start of semester):

Use textbook, search internet, HCC library, and other safety resources to:

- Each team member prepares a written report on Code of Ethics for Engineers and Engineering Technology. Usually it is no more than one page. Each team member turns his/her report to the Team Leader for team discussion and team report. Each team member uses format indicated on the guide sheet for self-work page listed at the end of this syllabus. See guide sheet of self-work and use it to communicate all individual work to TL. Late evidence of self-work will not be accepted. Support documentation will be required only for emergency cases.
- It can be typed up or handwritten.
- This is a teamwork paper. Each member must show his/her contribution to the work turned in for grade. Hint: Go to societies of engineers, try www.nspe.org, or www.IEEE.org, SCE, SCE, SME, SPE(Compare and find most common canons)
- Each member selects three canons (most important to his or her opinion or based on most used canons) and explains why they are important (so that to convince or persuade other team members the importance of his/her canons).

- Team members meet together with Team Leader and select one of the self-work (select most important from the work turned in by all members - according to team's opinion).
- Team prepares a written report (no more than one page) on Code of Ethics and TL explains why team selected the particular canons. TL turns in the report to be graded. TL attaches each self-work from each member as proof of individual work.

2-Assignment TWO (Due by the date assigned for the team in class before each tests):

Study review questions in the back of each chapter and present to class (they can be and are on the tests).

Note: Answers are on the Learning Web. See How to find syllabus and RQ on LW at the end of this syllabus.

Each team will be assigned chapter(s) for RQ to study and present summary to class. TL, ATL, and members of team will divide the load. If a member is absent on the day of presentation the member will receive zero points for assignment. Proof and documentation for absence is required. Document for emergency cases may help with some points but max will not be awarded. Note: 40% of class grade comes from teamwork projects.

- It is strongly recommended that team presents at least one personal experience (witness) in accident/violation of General Safety Rules Used in the Operation and Maintenance of Typical Chemical Plant or Refinery, or an example in relation to Process Safety, Health, and Environment covering damage and destruction severity of the accident/violation in each presentation. Tie your personal experience to an Act or Hazard Safety Rules in place to save lives, environment, or property (regulation examples: HAZWOPER, HAZCOM, PPE, Permit System, and so on).
- Explain how presenting your personal experience helps you change your attitude about safety.
- TL turns in one page Title Page (roster) for team for grading purposes to show who did what. No written reports need to be prepared (do not waste paper). This is an ongoing event throughout the semester. Graded Title Page will become part of course records. See guide sheet for Tile Page roster at the end of this syllabus.

3-Assignment THREE, team members present to class (due from week#2- to Final week):

- Use textbook, search internet, HCC library, and other safety resources to prepare a written report (two to ten pages) on disasters in Oil/Gas or Process industry. TL turns a hardcopy of the report and attaches evidence of self-work for each member for team report grading
- Report should cover what, where, when, who, how, why for the disaster.
- TL and the team meet (on a regular basis outside of class time) and decide who is going to do what.
- See list of disasters and select one to prepare and present.
- TLs will secure instructor's approval.
- Each team member prepares his or her part. See guide sheet for team member page format.
- **Present to class an Oil/Gas or Process (DISASTER) violation in recent years.**
- **Present to class what caused it and what could have prevented the disaster.**
- **Present to class what Safety Act(s) are now or will need to be in place to prevent this disaster from happening again if applicable.**
- **Present to class how this report changes your attitude about safety.**
- **See presentation grading criteria mentioned in this document.**
- Tie the safety agency or Act to the disaster if applicable.
- Provide updates to the class on the latest development of the Act if applicable.
- Provide current news happening right now (related to the disaster if applicable)..
- This is a team work project and each member will contribute with portion of the project (proof of each member's work must be provided).
- Team members will receive individual presentation grade and a team report grade.

- Search for extended damage that can linger along years after the disaster.
- Each member must provide evidence of work contribution for his/her part to TL and should be attached to the report.
- Show graphics (Destruction/Death). Cover extent of damage, casualties, cost, and prevention actions.

Guide Sheet for

Emergency Support Document and acknowledgement letter for late or missed assignment

In order to receive full credit for scores for missed and or late assignments, student needs to provide a hard copy of support evidence for emergency cases and a letter (hand written preferred, signed and dated) covering the following statements from the syllabus (hand it to instructor in person next class):

1- You need to say that you know you will be awarded 0 point for any late work for non-emergency cases no later than one class period after the date of emergency.

2- You need to say that you know that emergency cases are things beyond student's control like health, accidents, and cases in life that occur unplanned once-in-a-while or non-frequent.

3- You need to say you will do everything in your power to show student ethical behavior for all courses in SciEngTech at HCC-NE and turn in all required assignments on-time as specified in their respective syllabi.

How to Find Syllabus, Power Point Presentation and Review Questions on LW or EagleOnline 2: For Learning Web

Go to www.hccs.edu, select For Information, click faculty, click Learning Web, search for SAMEEI, Click on the name/picture, select PTAC 1308, select semester find appropriate semester syllabus and RQ answers for each chapter.

For Eagle Online 2

Visit www.hccs.edu, (click on) for information, faculty or student, click on EgleOnline2, Log In with your student ID and password, locate PTAC 1308 fall 2014 #27652, locate copy of syllabus, Power Point Presentation, and the review questions.

Email Procedures

I check my email frequently and strive for a less than 48-hour response time to your messages, but please be patient. Include the following information in each email (what where when who how why):

1. Identify the course number and course title.
2. Identify yourself stating your full name as you registered for this course.
3. Identify the assignment and date due or the subject of your message/question.
4. It is highly recommended for all team members to stay in touch with their respective TL and ATL throughout the semester by email and phone for all team-work projects.