Brazosport College

Syllabus for PTAC 1410 - Process Technology I – Equipment

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I. COURSE DESCRIPTION

PTAC 1410 - Process Technology I – Equipment CIP 4103010003
This course includes instruction in the use of common process equipment such as piping, valves, pumps and motors, and larger equipment related to the chemical industry such as reactors, separation equipment, and vessels. Laboratory exercises include the operation and maintenance of process equipment, and a study of the design of process equipment. Course topics will be reinforced through plant scenarios performed at the Process Equipment Trainer. **Credit Hours:** 4 (3 lecture, 2 lab)

January 2022

A. **Required skill level:** College-level reading and writing. Math: College-level with corequisite (placement code 3).

II. STUDENT LEARNING OUTCOMES

On successful completion of this course:

1. The student will be able to name, describe, and explain the design and operation of major items of chemical and refining process equipment. At a minimum, the list of process equipment will include:

   Tanks and vessels, pumps, compressors, turbines, electrical motors and electrical control circuits, internal combustion engines, heat exchangers, cooling towers, furnaces, boilers, separation equipment for distillation, extraction and absorption equipment, reactors, filters and dryers, and solids handling equipment.

2. The student will be able to identify, describe, assemble, and demonstrate proper use of operational equipment and operating materials such as tools, valves, piping, tubing, hoses, fittings, and lubricants.

3. The student will recognize, explain, and interpret technical plant drawings and monitor screen displays, including the common symbols used for process equipment, piping, and control instruments, and will locate corresponding equipment in the physical process plant.

4. The student will identify and demonstrate knowledge and ability to use safety equipment and signage used in the process plant and will explain and describe issues related to safe and environmentally-correct operation of process equipment, and operation of air and water pollution control equipment and flares.

5. The student will describe, demonstrate, and apply knowledge of basic maintenance procedures and precautions used for operating equipment in the chemical process plant.

6. The student will demonstrate knowledge of lock-out/tag-out procedures, including administrative requirements such as red tags, safe work permits, and task analysis cards, in addition to the use of piping and instrument diagrams, and will correctly apply these procedures to process equipment in the plant.

Assessment of successful completion is by satisfactory performance on written exams, completion of related laboratory and shop activities, and personal demonstration of knowledge and skills to the instructor.

Process Technology I is one of the courses in the Process Technology Degree Program. This two-year or four-year program has been created to train students for careers as Process Technicians in the chemical and refining process industries. This course is a foundation for all other courses in the PTAC program.

III. TEXAS SKILL STANDARDS BOARD Skill Standards

1. Monitor and regulate fired heaters/furnace system
2. Monitor and regulate boiler system
3. Monitor and regulate cooling water system
4. Monitor and regulate heat exchanger system
5. Monitor and regulate flare system

IV. COURSE ACADEMIC OBJECTIVES

Topic Name	Objectives
Introduction to Tools and Equipment used in Process Industries	1. Describe the appropriate uses of basic hand tools. 2. Describe the appropriate uses of basic power tools. 3. Describe the appropriate uses of sparking and non-sparking tools. 4. Describe hand and power tool safety. 5. Describe the appropriate care of hand and power tools. 6. Identify and describe the appropriate uses of lifting equipment. 7. List types of equipment used in the process industries: • Movers (pumps, compressors, conveyor belts, elevators, etc.) • Power sources (electric, steam, fuels, hydraulic, pneumatic, etc.) • Processors (separation, purification, reaction, etc.) • Heating/cooling units (fin fans, chillers, boilers, cooling towers, exchangers, etc.) 8. Using the above list, describe equipment operations common to the process industries. 9. Describe the importance of plant equipment maintenance and predictive/preventive maintenance procedures in the process industries. 10. Discuss different plant approaches to assigning operator performed maintenance tasks. 11. Describe the process technician's role in performing basic maintenance tasks. 12. Describe the process technician's role in preparing equipment for maintenance.
Overview-Piping, Tubing, Hoses & Fittings	1. Describe the purpose of piping, tubing, hoses and fittings in the process industries. 2. Describe the types and uses of piping, tubing, hoses and fittings. 3. Explain the reasons for pressure and temperature limits of hoses and fittings. 4. List and describe or demonstrate various fittings used for pipe, tubes, and hoses and their assembly. 5. Discuss the uses, advantages, and cautions for the types of materials used for piping. 6. Discuss different schedules for piping thickness and ratings on flanges for required service. 7. Discuss selection and sizing criteria as related to pressure, temperature, flow and corrosiveness of fluids.

Topic Name	Objectives
Overview-Piping, Tubing, Hoses & Fittings (cont.)	8. Describe the consequences of improper selection of materials of construction. 9. Identify types of connections. 10. Describe the use of sealant compounds. 11. List and describe different hose fittings for utility service (including bottled gases) and the consequences of cross-connections (cross-contamination). 12. Describe the hazards associated with inappropriate cross-connections (e.g., nitrogen to air. 13. Identify and describe plugs, caps and double block and bleed applications. 14. Describe the use and selection of gaskets. 15. Describe the process technician's responsibilities regarding the selection, maintenance and repair of pipe, tubing, hoses, and fittings. 16. Identify typical problems associated with pipe, tubing, hoses, and fittings.
Valves	1. Describe the various types of valves in the process industries. • Globe • Gate • Ball • Check • Etc. 2. Describe the purpose of common types of valves. • Block • Control • Throttling • Safety 3. Describe the components of valves. 4. Explain the purpose of each component. 5. Describe the selection of valves based on their compatibility with the process (materials of construction, pressure rating, connections, etc.) 6. Describe or demonstrate the operating principles of valves. 7. Describe safety and environmental concerns associated with valves. 8. Discuss typical procedures associated with valves. 9. Describe the process technician's role in valve operation and maintenance. 10. Identify typical problems associated with valves.
Pumps	1. Describe the purpose of pumps in the process industries. 2. Describe common pump types. 3. Describe the purpose of a pump performance curve. 4. Describe the components of centrifugal pumps (include bearings, seals, packing, etc.). 5. Explain the purpose of each component. 6. Describe or demonstrate the operating principles of centrifugal pumps

Topic Name	Objectives
Pumps (cont.)	7. Identify typical problems associated with centrifugal pumps (cavitation, NPSH –Net Positive Suction Head, etc.). 8. Describe the components of positive displacement pumps (include bearings, seals, packing, etc.). 9. Explain the purpose of each component. 10. Describe the operating principles of positive displacement pumps. 11. Identify typical problems associated with positive displacement pumps. 12. Describe safety and environmental concerns associated with pumps. 13. Identify typical procedures associated with pumps 14. Describe the process technician's role in pump operation and maintenance.
Compressors	1. Describe the purpose of compressors in the process industries. 2. Describe common compressor types. 3. Describe the components of compressors (loading valves, anti-surge protection, seals, etc.). 4. Explain the purpose of each component. 5. Describe the operating principles of compressors. 6. Identify typical problems associated with compressors. 7. Describe safety and environmental concerns associated with compressors. 8. Identify typical procedures associated with pumps. 9. Describe the process technician's role in compressor operation and maintenance.
Turbines	1. Describe the purpose of turbines in the process industries. 2. Identify the common types/applications of turbines (steam, gas, etc.). 3. Describe the components of a turbine (including governor control and over-speed trip systems). 4. Explain the purpose of each component. 5. Describe or demonstrate the operating principles of turbines. 6. Describe safety and environmental hazards associated with turbines. 7. Identify typical procedures associated with turbines. 8. Describe the process technician's role in turbine operation and maintenance. 9. Identify typical problems associated with turbines.
Motors and Engines	1. Describe the purpose of motors and engines in the process industries. 2. Identify the common types/applications of motors and engines. 3. Identify major components of engines and electric motors. 4. Explain and/or demonstrate the operating principles of motors and engines. 5. Describe safety and environmental hazards associated with motors and engines. 6. Discuss typical procedures associated with motors and engines. 7. Describe the process technician's role in operation and maintenance of motors and engines. 8. Discuss typical problems associated with motors and engines.

Topic Name	Objectives
Power Transmission and Lubrication	1. Describe the principles of power transmission and lubrication. 2. Explain the role of power transmission and lubrication in the process industries. 3. Describe the purpose of major transmission components. 4. Describe types of bearings, seals and couplings. 5. Explain the functions of thrust, radial, and vibration bearings. 6. Describe gears and their uses. 7. Describe safety and environmental hazards associated with transmission and lubrication. 8. Discuss typical procedures associated with transmission and lubrication. 9. Describe the process technician's role in transmission and lubrication procedures 10. Discuss typical problems associated with transmission and lubrication.
Heat Exchangers	1. Describe the purpose of heat exchangers in the process industries. 2. Identify the common types/applications of heat exchangers (including mechanical heat exchangers such as fin fans). 3. Describe the components of heat exchangers. 4. Explain the purpose of each component. 5. Describe or demonstrate the operating principles of heat exchangers. 6. Describe safety and environmental hazards associated with heat exchangers. 7. Discuss typical procedures associated with heat exchangers. 8. Describe the process technician's role in heat exchanger operation, maintenance, and efficiency. 9. Identify typical problems associated with heat exchangers. 10. Describe the role of heat exchangers in energy conservation (economizers, etc.).
Cooling Towers	1. Describe the purpose of cooling towers in the process industries. 2. Identify the common types of cooling towers. 3. Define terms associated with cooling towers. 4. Identify the components of cooling towers. 5. Explain the purpose of each component. 6. Describe the operating principles of cooling towers. 7. Describe safety and environmental hazards associated with cooling towers. 8. Discuss the use and purpose of chemical addition to cooling tower water. 9. Discuss typical procedures associated with cooling towers. 10. Describe the process technician's role in cooling tower operation and maintenance. 11. Discuss typical problems associated with cooling towers.
Furnaces – Heaters	1. Describe the purpose of furnaces in the process industries. 2. Identify the common types/applications of furnaces. 3. Define terms associated with furnaces. 4. Identify major components of furnaces.

Topic Name	Objectives
Furnaces – Heaters (cont.)	5. Explain the purpose of each component. 6. Explain the operating principles of furnaces. 7. Discuss typical operating/safety procedures associated with furnaces. 8. Describe safety and environmental hazards associated with furnaces (including stack and emissions controls). 9. Describe the process technician's role in furnace operation and maintenance. 10. Discuss furnace operations as it relates to energy efficiency. 11. Identify typical problems associated with furnaces.
Boilers	1. Describe the purpose of boilers in the process industries. 2. Identify the common types/applications of boilers. 3. Define terms associated with boilers. 4. Identify major components of boilers. 5. Explain the purpose of each component. 6. Explain the operating principles of boilers. 7. Discuss typical operating/safety procedures associated with boilers. 8. Describe the process technician's role in furnace and boiler operation and maintenance. 9. Describe the process technician's role in boiler operation, maintenance, and operator qualification. 10. Discuss boiler operations as it relates to energy efficiency and emissions. 11. Identify typical problems associated with boilers.
Filters	1. Describe the purpose of filters in the process industries. 2. Identify the common types/applications of filters. 3. Define terms associated with filters. 4. Identify the components of filters. 5. Explain the purpose of each component. 6. Describe the operating principles of filters. 7. Describe safety and environmental hazards associated with filters. 8. Discuss typical procedures associated with filters. 9. Describe the process technician's role in filter operation and maintenance. 10. Discuss typical problems associated filters.
Dryers	1. Describe the purpose of dryers in the process industries. 2. Identify the common types/applications of dryers. 3. Define terms associated with dryers. 4. Identify the components of dryers. 5. Explain the purpose of each component. 6. Describe the operating principles of dryers. 7. Describe safety and environmental hazards associated with dryers. 8. Discuss typical procedures associated with dryers. 9. Describe the process technician's role in dryer operation and maintenance. 10. Discuss typical problems associated with dryers.

Topic Name	Objectives
Vessels – Part I – Towers & Columns	1. Describe the purpose of towers and columns in process industries. 2. Describe the common types/applications of towers and columns. 3. Identify the components of towers and columns. 4. Explain the purpose of each component. 5. Explain the operating principles of towers and columns. 6. Describe safety and environmental hazards associated with towers and columns. 7. Discuss typical procedures associated with towers and columns operation and maintenance. 8. Describe the process technician's role in towers and columns operation and maintenance. 9. Discuss typical problems associated with towers and columns.
Vessels – Part II – Reactors	1. Describe the purpose of reactors in process industries. 2. Describe the common types/applications of reactors. 3. Identify the components of reactors. 4. Explain the purpose of each component. 5. Explain the operating principles of reactors. 6. Describe safety and environmental hazards associated with reactors. 7. Discuss typical procedures associated with reactors operation and maintenance. 8. Describe the process technician's role in reactors operation and maintenance. 9. Discuss typical problems associated with reactors.
Vessels – Part II – Tanks and Drum	1. Describe the purpose of tanks and drums in process industries. 2. Describe the common types/applications of tanks and drums. 3. Identify the components of tanks and drums. 4. Explain the purpose of each component. 5. Explain the operating principles of tanks and drums. 6. Describe safety and environmental hazards associated with tanks and drums. 7. Discuss typical procedures associated with tanks and drums operation and maintenance. 8. Describe the process technician's role in tanks and drums operation and maintenance. 9. Discuss typical problems associated with tanks and drums.
Flares	1. Describe the purpose of flares in process industries. 2. Describe the common types/applications of flares. 3. Identify the components of flares. 4. Explain the purpose of each component. 5. Explain the operating principles of flares. 6. Describe safety and environmental hazards associated with flares. 7. Discuss typical procedures associated with flare operation and maintenance. 8. Describe the process technician's role in flare operation and maintenance. 9. Discuss typical problems associated with flare.

Topic Name	Objectives
Process Diagrams	1. Explain the purpose of diagrams including why/when/where they are used. 2. Identify the major unit sections in flow sequence. 3. Describe symbols used for major process equipment. 4. Identify components on a typical PFD (Process Flow Diagram). 5. Identify components on a typical P&ID (Piping and Instrument Diagram).
Facility Tour (optional)	Discuss course learning objectives on process equipment within a process facility.

V. STUDENT SKILL- LEARNING AND SKILL-TESTING OUTCOMES

A. SKILL-LEARNING

OUTCOME	METHOD OF ASSESSMENT
Identify safety-related signage in the chemical plant. Identify and as appropriate operate safety-related equipment. In the plant, locate and identify utility lines, heat exchangers, and compressors	Completion of activity 1 in the Equipment Exercises book
Locate information in a chemical SDS sheet	Completion of activity 1 in the Equipment Exercises book
Make suitable isometric drawings of selected process equipment	Completion of activity 2 in the Equipment Exercises book
Demonstrate ability to locate and identify process equipment and instrument loops in the plant, in the P&IDs, and on the control screen. Demonstrate ability to trace piping in the plant.	Completion of activities 3-6 in the Equipment Exercises book
Assemble a flange connection using a torque wrench	Completion of activity 7 in the Equipment Exercises book
Coil and uncoil plant hoses, make hose connections	Completion of activity 8 in the Equipment Exercises book
Identify common valve types (gate, globe, ball, butterfly, check). Identify common internal and external valve parts	Completion of activity 9 in the Equipment Exercises book
Disassemble and reassemble a gate valve	Completion of activity 10 in the Equipment Exercises book
Using a pipe wrench, channel locks, tubing benders and cutters, assemble and disassemble piping and tubing fittings	Completion of activities 11-12 in the Equipment Exercises book

OUTCOME	METHOD OF ASSESSMENT
Identify the internal and external components of an electric motor	Completion of activity 13 in the Equipment Exercises book
Identify the internal and external components of a centrifugal pump. Operate an acrylic pump and record observations of inlet and discharge pressures under different conditons	Completion of activities 14 and 16 in the Equipment Exercises book
Identify the internal and external components of a steam turbine	Completion of activity 15 in the Equipment Exercises book
Locate electrical motors and their control boxes. Record motor nameplate information. Explain the function of emergency stops, HOA switches, and control box indicator lights	Completion of activity 17 in the Equipment Exercises book
Diagram a heat exchanger, showing external and internal parts. Operate an acrylic heat exchanger	Completion of activity 18 in the Equipment Exercises book
Describe the design and operation of a cooling tower. Operate, and collect and analyze data from an acrylic model of a cooling tower	Completion of activity 19 in the Equipment Exercises book
Describe the design and operation of a distillation tower, including trays, packing, distribution header and valve covers. Operate an acrylic model of a cooling tower and describe liquid and gas flows	Completion of activity 20 in the Equipment Exercises book
Using a valve wrench, set valves for operation of a pump, heat exchanger, filter and control valve. Set valves for operation of instrumentation loops.	Completion of activities 21-25 in the Equipment Exercises book
Operate a pump in recirculation, check lubrication, and set seal flush flow	Completion of activities 21-25 in the Equipment Exercises book
Set valves for operation of a compressed air system	Completion of activities 21-25 in the Equipment Exercises book
Explain the requirements of a positive displacement compressor	Completion of activities 21-25 in the Equipment Exercises book
Operate a positive displacement air compressor	Completion of activities 21-25 in the Equipment Exercises book
Operate a resin bed air drying system	Completion of activities 21-25 in the Equipment Exercises book
Communicate between the plant and the control room via two-way radios	Completion of activities 21-25 in the Equipment Exercises book

OUTCOME	METHOD OF ASSESSMENT
Stroke a control valve to check proper operation	Completion of activities 21-25 in the Equipment Exercises book
Control a flow manually and using an automatic control loop	Completion of activities 21-25 in the Equipment Exercises book
Switch operation between parallel pumps using the concept of "bump less transfer"	Completion of activity 26A in the Equipment Exercises book
Switch operation between parallel heat exchangers	Completion of activity 26C in the Equipment Exercises book
Write a Safe Work Permit for maintenance on a pump. Using Red Tags and padlocks, isolate the pump according to Lock Out/Tag Out procedures	Completion of activity 27 in the Equipment Exercises book

B. SKILL TESTING

Students will demonstrate mastery of the following skills in a one-on-one session with the instructor.

Safety:
Identify the PPE requirements to work in the BASF building plant facilities? (Hard hat, side shield glasses, gloves, and hearing protection)
Demonstrate Tool Operation:
Wrap pipe threads with Teflon tape.
Pipe Wrench (Screw Nipple into Tee/Loosen)
Channel Locks (Screw Nipple into Tee/Loosen)
Valve Identification:
Identify common valves by design or function
• Using cutaways on back porch ID: (Plug, Check, Diaphragm, Ball, Globe, Control Valve, Gate)
• How do you tell when a ball valve is open?
• How do you tell when a gate valve is open?
Pumps:
On the cutaway identify the mechanical seal
Demonstrate and explain the direction of flow in a centrifugal pump
Drawings: Using a P&ID Identify
• Pump
• Distillation Tower
• Heat Exchanger
• Drum

VI. TEXTBOOK OR COURSE MATERIAL INFORMATION

A. Textbook

1. Process Technology Equipment, 2nd Ed., NAPTA, Pearson Publish 2019. ISBN: 978-0-13-489126-2 (required)
2. Process Equipment Lab Exercises, BC Custom Publisher, March 2021 (required)
3. Hardhat (required)
4. Safety Glasses (required)
5. Gloves (required)

"Required course materials are available at the Brazosport College bookstore, on campus or online at http://www.brazosport.edu/bookstore. A student of this institution is not under any obligation to purchase a textbook from the college bookstore. The same textbook is/may also be available from an independent retailer, including an online retailer."

For Distance Education Courses include the following: Contact the Brazosport College Bookstore with a credit card for course materials. Phone: 979.230.3651. Fax: 979.230.3653. Email: bookstore@brazosport.edu. Website: http://www.brazosport.edu/bookstore

Process Technology I is one of the courses in the Process Technology Degree Program. This two-year or four-year program has been created to train students for careers as Process Technicians in the chemical and refining process industries. This course is a foundation for all other courses in the PTAC program.

B. Course Outline

The outline for this course is laid in separate documents titled: **"PTAC 1410 Overview"** and **"PTAC-1410 Schedule"**

Important Semester Dates:
Last Day to Withdraw from Classes– Check BC Academic Calendar at http://catalog.brazosport.edu/index.php

Office Hours:
For fulltime faculty, office hours may change from semester to semester. Current faculty office hours are included on the syllabus, see link: https://brazosport.edu/faculty-and-staff/resources/course-syllabi-instructor-information/

For an adjunct faculty, no office hours are required, and they are not assigned an office. To set up an appointment with an adjunct, contact the instructor as per the email address on the syllabus, see link: https://brazosport.edu/faculty-and-staff/resources/course-syllabi-instructor-information/

VII. LAB REQUIREMENTS

Each class session will begin with a lecture portion, followed by a shop session. For the shop session, students will divide into shifts, and each shift will follow a rotation schedule for its activities during the semester.

VIII. STUDENTS WITH DISABILITIES

Brazosport College is committed to providing equal education opportunities to every student. BC offers services for individuals with special needs and capabilities including counseling, tutoring, equipment, and software to assist students with special needs. For student to receive any accommodation, documentation must be completed in the Office of Disability Services. Please contact Phil Robertson, Special Populations Counselor at 979-230-3236 for further information.

IX. TITLE IX STATEMENT

Brazosport College faculty and staff are committed to supporting students and upholding the College District's non-discrimination policy. Under Title IX and Brazosport College's policy FFDA (Local), discrimination based on sex, gender, sexual orientation, gender identity, and gender expression is prohibited. If you experience an incident of discrimination, we encourage you to report it. While you may talk to a faculty or staff member at BC, please understand that they are "Responsible Employees" and must report what you tell them to college officials. You can also contact the Title IX Coordinators directly by using the contact information below. Additional information is found on the Sexual Misconduct webpage at www.brazosport.edu/sexualmisconduct.

Alex Crouse, Director of Student Life and Title IX Coordinator
979-230-3355; alex.crouse@brazosport.edu

Mareille Rolon, HR Coordinator and Deputy Title IX Coordinator
979-230-3303; mareille.rolon@brazosport.edu

X. ACADEMIC HONESTY

Brazosport College assumes that students eligible to perform on the college level are familiar with the ordinary rules governing proper conduct including academic honesty. The principle of academic honesty is that all work presented by you is yours alone. Academic dishonesty including, but not limited to, cheating, plagiarism, and collusion shall be treated appropriately.

Academic dishonesty violates both the policies of this course and the Student Code of Conduct. In this class, any occurrence of academic dishonesty will be referred to the Dean of Student Services for prompt adjudication, and may, at a minimum, result in F, in this course. Sanctions may be imposed beyond your grade in this course by the Dean of Student Services. Please refer to the Brazosport College Student Guide for more information. This is available online at http://brazosport.edu/students/for-students/student-services/.

XI. ATTENDANCE AND WITHDRAWAL POLICIES

Class attendance contributes to your final grade, but you must attend class to successfully complete the course. If you are unable to complete this course, you must complete and submit a withdrawal form with the registrar's office. If the student decides to drop out of the class, it is the responsibility of the student to initiate a withdrawal before the withdrawal deadline in order to get a "W" on their transcript. If this is not done the student will receive a grade based on test grades and class grades earned during their attendance and absence (i.e., zeros on all missed materials, exams, skills tests, and final exam).

XII. COURSE REQUIREMENTS AND GRADING POLICY
TESTING MAKE-UP POLICY

A. Grading Policy

Homework	15%
• 13% - D2L Homework	
• 2% - Systran Modules	
Pop Quizzes	15%
Exams	25%
Final Exam	25%
Lab	20%
• 10% - Lab Exercises	
• 15% - Skills Test	
Total	**100%**

Grades are assigned as follows:

Grade	Final Average
A	89.5-100
B	79.5-89.4
C	69.5-79.4
D	59.5-69.4
F	Below 59.5

XIII. STUDENT CONDUCT STATEMENT

Students are expected to be aware of and follow the Brazosport College Student Code of Conduct. Students have violated the Code if they "fail to comply with any lawful directions, verbal or written, of any official at BC." Lawful directions include precautions and requirements taken to prevent the spread of COVID-19 at Brazosport College. Students who do not follow safety requirements, including the wearing of a mask, may be removed from class by their instructor and referred to the Dean of Student Services.

XIV. CAMPUS CLOSURE STATEMENT

Brazosport College is committed to the health and safety of all students, staff, and faculty and adheres to all federal and state guidelines. The College intends to stay open for the duration of the semester and provide access to classes and support services on campus in the safest way possible. The College will also comply with lawful orders given by applicable authorities, including the Governor of Texas, up to and including campus closure. It is possible that on campus activities may be moved online and/or postpone if such orders are given.

XV. STUDENT RESPONSIBILITIES

Students are expected to fully participate in this course. The following criteria are intended to assist you in being successful in this course:

1. Understand the syllabus requirements
2. Use appropriate time management skills
3. Communicate with the instructor
4. Complete course work on time, and
5. Utilize online components (such as Desire2Learn) as required.

a. Class attendance

Much of the learning occurs in classroom and shop settings and cannot be made up by simply reading the textbook.

Therefore, class participation is essential to learning. Attendance is taken at the beginning of every class and noted in the Logbook at end of each lab. **Class points can be made up for excused absences only**.

b. Homework

As a standing homework assignment, students should review the scheduled sections of the textbook before coming to class and prepare questions for class discussion. Students should again review the scheduled section following the class (review forward, read, review back).

c. Class participation

Participation grade is based on the quality (not frequency) of your contribution. Those receiving high grades in class participation will be those who:

- Prepared for class
- Arrive for class on time
- Excellent attendance
- Make comments and ask questions that significantly contribute to the learning environment of the class

d. Participate in shop and plant exercise and demonstration

e. Shop Logbook

Student is expected to bring his Equipment Exercises book to each class meeting. The class will be divided into four shifts/teams with 3 – 5 students per shift/team. Each person in a shift is to work with others to complete all assigned items such as data, drawings, or notes. Credit will not be given unless the work is done and the first page of each activity is signed and dated by the student, then signed and dated by a fellow team member. All signatures must be legible. Do not leave lab until all team members have completed, signed notebooks.

f. Attention in class

Unless allowed by the instructor, the use of cell phones, classroom or personal computers, or other electronic communication is not permitted. Personal conversations and other distractions are not permitted, and may result in disciplinary action, including a reduction in class grade. Students who take notes on electronic media, or who have an urgent need to remain in contact, should discuss their situations with the instructor.

g. Safety

Just as in the plants, safety will be treated of highest priority, even over completing any exercise. With that, no one will be allowed in the shop or plant area without a minimum of long work pants and long shirt sleeves, side shield safety glasses or chemical goggles, hard hat (in plant area and on porch), close-toed shoes, possession of hearing protection, and possession of cotton or leather gloves. Students are expected to intervene with others for lack of personal protective equipment or violation of safety rules.

XVI. OTHER STUDENT SERVICES INFORMATION

Information about the Library is available at http://www.brazosport.edu/library or by calling 979.230.3310.

For assistance with online courses, an open computer lab, online and make-up testing, audio/visual services, and study skills, visit Learning Services next to the Library, call 979.230.3253, or visit http://www.brazosport.edu/learningservices..

For drop-in math tutoring, the writing center, supplemental instruction and other tutoring including e-tutoring, visit the Student Success Center, call 979.230.3527, or visit http://www.brazosport.edu/studentsuccesscenter.

To contact the Physical Sciences and Process Technologies Department call 979.230.3618.

The Student Services provides assistance in the following:

Counseling and Advising	979.230.3040
Financial Aid	979.230.3294
Student Life	979.230.3355

To reach the Information Technology Department for computer, email, or other technical assistance call the Helpdesk at 979.230.3266.

Get the information you need – when you need it. Click http://geni.us/BRAZO to install **BC Connect** on your mobile device to receive reminders, explore careers, map your educational plan, be in the know about events, find out about scholarships, achieve your goals and much more.

Acknowledgement of receipt and understanding of Syllabus:

PTAC 1410
Instructors: Kenneth Resecker

I have read this syllabus and understand the course content and expectations of my instructors for this class.

Student Printed Name: _____

Student Signed Name: _____

Date Signed: _____

Note: Sign and return this page only to instructor by second class meeting.