# Brazosport College

## Syllabus for PTAC 2438 – Process Technology III – Operations

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## I. COURSE DESCRIPTION:

**PTAC 2438 - Process Technology III - Operations CIP** 4103010003
This course combines systems into operational processes with emphasis on operations under various conditions. Topics include typical duties of an operator. Laboratory exercises include the operation of a life-size distillation unit (Process Equipment Trainer). **Credit Hours:** 4 (3 lecture, 3 lab)

Chad Abney

Ron Colwell

Gregg Curry

Karl Grossman

Kenneth Resecker

Ed Smolen

Mark Stoltenberg

Gary Hicks

Jeff Detrick

August 2021

A. **Prerequisite:** Grade of "C" or better in **PTAC 2420**.
**Required skill level:** College-level reading, writing and math.

## II. COURSE OBJECTIVES

At the conclusion of the course:

**The operation of the process equipment trainer (PET) will be used to reinforce the following course objectives.**

| TOPIC | OBJECTIVES |
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| **Introduction to Operations** | 1. Discuss the importance of this course as a capstone experience in the Process Technology program and how the material learned here will prepare the student for work "on-the-job".<br>2. Recall the history and development of the process technician role within the process industries.<br>3. Apply the key concepts from the following course:<br>• Process Technology I – Equipment<br>• Process Technology II – Systems<br>• Instrumentation<br>4. Discuss the term "operations" and its process industries synonyms.<br>5. List the various process technician roles and responsibilities (i.e., "outside" versus "control room" tasks) within an operating unit.<br>• Operate and monitor unit from the control room (i.e., via DCS)<br>• Operate and monitor unit from the outside (i.e., by making rounds)<br>• Take and analyze (as required) samples (i.e., composite, grab, bomb, etc.)<br>• Perform housekeeping activities<br>• Conduct safety inspections<br>• Handle materials<br>• Prepare for, assist with, and/or perform maintenance as required.<br>6. Discuss the activities that may be the responsibility of the process technician of the future.<br>7. Discuss the importance of continual learning for process technicians. |
| **Diagrams for the Operating Unit**<br><br>**Diagrams for the Operating** | 1. Discuss the purpose of a block flow diagram (BFD).<br>2. Identify the major processing stages, which make up the generic operating unit (i.e., TimTene, campus unit, or unit at a local facility).<br>3. Identify the plant auxiliary and utility systems, which support the generic operating unit.<br>4. Describe the purpose of a process flow diagram (PFD) and the information and symbology found on a PFD.<br>5. Trace the process flow through the operating unit using the PFD.<br>6. Identify all process systems included in the generic operating unit from the PFD.<br>7. Identify all major process equipment associated with the generic |

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| **Unit (cont.)** | operating unit from the PFD.<br>8. Describe the purpose of a plot plan and the information found on a Center for the Advancement of Process Technology plot plan.<br>9. Discuss the purpose of a piping and instrumentation diagram (P&ID) and the information and symbology found on a P&ID.<br>10. Describe how the various areas and systems within the operating unit will be monitored and controlled (i.e., making rounds vs. via DCS).<br>11. Identify all local instruments for a Generic Unit using P&IDs. (Note: Filtration and Refrigeration systems are normally used at local community colleges).<br>12. Describe local/field instruments in terms of:<br>• The process variable monitored by the instrument<br>• Normal range<br>• Description of instrument function |
| **Commissioning** | 1. Define the term "commissioning".<br>2. Differentiate between starting up a new unit versus starting up an existing unit (i.e., design flaws, unknowns, etc.). |
| **Procedure Writing** | Given a process scenario, the student PT will write a normal operations procedure that ensures safety and environmental compliance with SH&E and OSHA regulations and minimizes downtime. |
| **Normal Startup - Overview and Communication** | 1. Discuss the different types of startups: normal/routine startup, startup after emergency shutdown, startup after equipment maintenance, and startup after turnaround.<br>2. Discuss unit startup activities as they relate OSHA's PSM (Process Safety Management of Highly Hazardous Materials) standard, specifically by PSM's Pre-Startup Safety Review element.<br>3. Describe the risks and hazards associated with unit startup.<br>4. Given a process flow diagram (PFD) and following safe operating procedures:<br>• identify typical activities involved when placing equipment into service and bringing a unit online<br>• List all the departments and personnel who will be involved in or affected by the unit startup<br>• List the types of information that will need to be communicated regarding unit startup<br>5. Discuss the communication methods that might be used at different points during the process of starting up the unit |
| **Normal Startup - Preparing Equipment for Return to Service**<br>**Normal Startup - Preparing Equipment for Return to Service (cont.)** | 1. Discuss the importance of obtaining an accurate estimate for when equipment will be returned from maintenance personnel.<br>2. List the energy and equipment isolation methods and devices that must to be removed after equipment maintenance.<br>3. List the equipment used by maintenance or contractors, which may need to be removed.<br>4. List the final safeguards, which should be taken prior to returning |

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| | the equipment to service.<br>5. List the common inspections needed to assure mechanical integrity. |
| **Normal Startup – Removal of Energy Isolation Devices** | 1. Review the OSHA Control of Hazardous Energy (Lockout/Tagout) standard.<br>2.Discuss the various methods and devices which can be used to isolate equipment from the various types of energy sources:<br>• Lock<br>• Tag<br>• Blind<br>• Double block and bleed<br>• Break<br>• Disconnect<br>• Switch gear<br>3.Discuss the various types of energy sources that must be isolated:<br>• Chemical<br>• Electrical<br>• Hydraulic<br>• Mechanical<br>• Pneumatic<br>• Thermal<br>4. Identify the points where energy isolation is required, and the device/method used at each point.<br>5.Discuss who should remove the energy isolation devices.<br>6. Discuss the steps that must be followed when removing energy solation devices. |
| **Normal Startup – Utilities and Auxiliaries**<br><br>**Normal Startup – Utilities and Auxiliaries (cont.)** | 1. Describe the purpose and function of the utility and auxiliary systems, which support the operating unit:<br>• Boiler Feed Water Treatment System<br>• Steam Generation and Distribution<br>• Cooling Tower and Cooling Water System<br>• Air System<br>• Water System<br>• Electrical<br>• Natural Gas<br>• Nitrogen<br>• Sewer<br>• Flare and Relief<br>• Refrigeration<br>2. Describe the hazards associated with starting up each system.<br>3. Describe the precautions that must be taken to mitigate the hazards associated with starting up the utility systems.<br>4. Given a utility flow diagram (UFD) list the steps required to startup steam and systems, including valve alignment:<br>• Identify all valves that must be checked for proper alignment.<br>• State the proper position for each valve for startup.<br>• State whether the valves will be check via the DCS and/or via the field technician. |

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| | • Position the valves correctly |
| **Normal Startup - Process Unit** | 1. Describe the hazards associated with starting up each process system and the unit.<br>2. Describe the precautions that must be taken to mitigate the hazards associated with starting up each process system and the unit.<br>3. Discuss the order in which the various process, auxiliary, and utility systems should be started up.<br>4. List the steps required to start a process unit. |
| **Normal Operations – Field Technician** | 1. List all of the types of equipment within an operating unit, such as a Filtration System and Refrigeration System that will be monitored and/or started, stopped or switched by the field technician, such as:<br>• Compressors<br>• Exchangers<br>• Motors<br>• Pumps<br>• Valves<br>• Vessels<br>• And others<br>2. Describe how specific types of equipment must be monitored to ensure proper operation.<br>3. Describe how to check various types of equipment for vapor and liquid leaks.<br>4. Explain the corrective action that should be taken for each type of leak.<br>5. Discuss environmental impact of leaks and failure to take corrective action.<br>6. Describe typical equipment, tools and personal protective equipment required when performing routine tasks in the field.<br>7. Discuss other types of personal protective equipment that may be required when performing routine field tasks in hazardous environments.<br>• Flash suits<br>• SCBA (Self-Contained Breathing Apparatus)<br>• Face shields<br>• Chemical Resistant Suits<br>8. Discuss the methods used to document the technician's work in the field. |

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| **Normal Operations – Control Room Technician** | 1. Distinguish between an analog (pneumatic/electronic) control system versus a digital (Distributive Control System, Programmable Logic Controller) system.<br>2. Differentiate between instruments that:<br>• Control<br>• Indicate<br>• Record<br>3. Identify instruments that have alarm and/or shutdown functions.<br>4. Identify instruments that are included in logic systems.<br>5. Identify the set point, alarm, shut down, and trip information.<br>6. List the possible causes for level and flow alarms.<br>7. List the corrective actions for level and flow alarms.<br>8. Discuss the importance of communicating with other technicians and other units prior to taking certain corrective action.<br>9. Discuss other duties typically assigned to the board operator, such as data entry, recordkeeping, etc. |
| **Normal Operations - Other Duties** | 1. Given a process scenario (i.e., process flow diagram, piping and instrument diagram, model, etc.) during receiving, storage or transfer activities:<br>• Identify the process streams within an operating unit that will require periodic sampling<br>• Describe the sampling procedures and equipment that are used for different sampling events<br>• Discuss the personal protective equipment that must be used while performing different sampling activities<br>2. Explain the importance of following the sampling procedure precisely.<br>3. Discuss the process technician's role in sample analysis.<br>4. Discuss the various types of analyses (methods and equipment) conducted on process samples.<br>5. Explain the importance of sample analysis to the proper unit operation.<br>6. Identify the points within the operating unit where the following types of process materials are handled manually:<br>• Supply materials (lube oil, etc.)<br>• Catalyst and chemicals<br>7. Discuss the equipment used to receive, store or transfer materials at various points.<br>8. Discuss the procedures used to receive, store or transfer materials including:<br>• Proper labeling<br>• Proper documentation<br>• Product identification<br>• Specifications (Certificate of Quality, etc.)<br>9. Discuss the hazards associated with receiving, storing or transferring various raw materials and finished products. |

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| **Normal Operations - Other Duties (cont.)** | 10. Discuss the personal protective equipment that must be used while performing various receiving, storage or transfer during material handling activities. |
| **Normal Operations – Housekeeping and Complying with SH&E Policies** | 1. Define "housekeeping" in process industries terms.<br>2. List the types of tasks that can be categorized as housekeeping.<br>3. Explain why attention to housekeeping is important.<br>4. Discuss the personal protective equipment that must be used while performing various housekeeping activities.<br>5. Discuss safety, health, and environmental risks or hazards found within the process industries.<br>6. Discuss-methods to minimize or prevent these risks or hazards.<br>7. Discuss typical SH&E policies and procedures, which may be implemented in order to minimize or prevent SH&E risks and/or hazards.<br>8. Discuss how unit personnel assist in this implementation.<br>9. Identify the safety equipment located in the various areas of the operating unit.<br>10. Describe what items are inspected when checking each piece of safety equipment.<br>11. Describe how often each piece of safety equipment is inspected. |
| **Normal Operations - Verbal Communication** | 1. Discuss the basic components associated with effective verbal communication: sender, receiver, message, interference, and feedback.<br>2. Discuss the key obstacles that prevent effective verbal communication.<br>3. Demonstrate effective verbal communication techniques to ask for or provide information.<br>4. Identify and describe the various roles within the Operations Department with which process technicians will communicate.<br>5. Identify and describe the various roles from other areas of the plant with which process technicians will communicate.<br>6. Discuss the various types of information that may be exchanged verbally (face-to-face) between these personnel/departments and process technicians.<br>7. Discuss verbal and non-verbal communication methods used in noisy environments (i.e., Hand signals).<br>8. List the different types of electronic communication devices (radios, intercoms, phones, cell phones, voice-activated radios, etc.) used in the process industries today.<br>9. Discuss the various features and functions of electronic communication devices.<br>10. Discuss the features and functions that should be tested for operability prior to using the electronic communication device.<br>11. Demonstrate how to test the electronic communication device for operability.<br>12. Discuss proper protocol for using these different types of electronic communication devices. |

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| **Normal Operations - Written Communication** | 1. Review the basic components of written communication (grammar, spelling, style, legibility, transitions, etc.) for clear, concise, and descriptive communication.<br>2. Review-the basic components of good writing: preparation, formatting, drafting and proofreading.<br>3. Identify and describe the various personnel within the Operations Department with which process technicians will communicate in writing.<br>4. Identify and describe the various personnel from other areas of the plant with which process technicians will communicate in writing.<br>5. Discuss the various types of information that may be exchanged in written form (using paper or electronic means) between these personnel/departments and process technicians.<br>6. Discuss situations when written communication (electronic or paper) should be used rather than verbal communication, and vice versa.<br>7. Discuss the importance of following company guidelines when preparing written communication whether paper or electronic.<br>8. Demonstrate effective written communication techniques for asking or providing information. |
| **Normal Operations - Shift Change** | 1. State the types of information which need to be communicated during shift change:<br>• Unit status<br>• Alarms<br>• Equipment condition/problems<br>• Procedures in progress<br>• Process trends<br>• Maintenance activity completed, in-progress, and planned<br>• Presence of non-operating personnel<br>• Status of permits in force<br>2. Discuss the level of detail necessary to accurately convey complete unit status information.<br>3. Describe how a typical shift change occurs.<br>• personnel involved<br>• importance of making timely relief<br>• location<br>4. List the documentation used during a typical shift change.<br>5. Discuss the importance of establishing good relationships with members of your shift and members of other shifts. |

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| **Abnormal Operations - Emergencies** | 1. Discuss what types of events could be considered "emergency situations".<br>2. Describe how operating personnel prepare for each situation (i.e., drills, exercises).<br>3. Discuss actions that should be taken to mitigate each situation.<br>4. Discuss what types of conditions could be considered "emergency operations".<br>5. Identify possible causes for these various conditions.<br>6. Discuss possible corrective action for each of the various possible causes.<br>7. Discuss how each of these critical conditions could affect the normal operation of the unit's process, utility, and auxiliary systems.<br>8. Discuss the field technician's role during emergency situations and operations.<br>9. Discuss the board technician's role during emergency situations and operations. |
| **Abnormal Operations – Applications** | 1. Given a potential emergency scenario and appropriate resources (P&IDs, process flow sheets, etc.), write an emergency procedure that complies with SH&E practices and OSHA regulations.<br>2. Given an emergency scenario and an emergency procedure, demonstrate the appropriate emergency response to the emergency operating situation that complies with SH&E practices and OSHA regulations. |
| **Normal Shutdown - Overview and Communications** | 1. Differentiate between the types of shutdowns: normal/routine shutdown, emergency shutdown, shutdown for equipment maintenance, and shutdown for turnaround.<br>2. Describe the risks and hazards associated with unit shutdown.<br>3. Describe how unit shutdown activities are covered by OSHA's PSM (Process Safety Management of Highly Hazardous Materials) standard.<br>4. List the key activities involved in performing a normal/routine shut down.<br>5. List all departments and personnel who will be involved in, or affected by, the unit shutdown.<br>6. List the types of information that will need to be communicated regarding unit shutdown.<br>7. Discuss the communication methods that might be used at different points during the process of shutting down the unit. |
| **Normal Shutdown - Shutdown Process Unit**<br><br>**Normal** | 1. Given a scenario, discuss the order in which the various process auxiliary and utility systems should be shut down.<br>2. For a process system:<br>• Describe the hazards associated with shutting a system down.<br>• Describe the precautions that must be taken to mitigate the hazards associated with shutting down each system.<br>• List the steps required to shut down each system.<br>• Discuss how shutdown of the process system affects upstream |

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| **Shutdown - Shutdown Process Unit (cont.)** | and downstream processes<br>3. For an auxiliary system:<br>• Describe the hazards associated with shutting down the system.<br>• Describe the precautions that must be taken to mitigate the hazards associated with shutting down each system.<br>• List the steps required to shut down each system.<br>4. For a utility system:<br>• Describe the hazards associated with shutting down the system.<br>• Describe the precautions that must be taken to mitigate the hazards associated with shutting down each system.<br>• List the steps required to shut down each system.<br>5. Discuss the importance of following the written procedure and the protocol for handling discrepancies between the documented procedure and actual steps followed to complete the task. |
| **Equipment Maintenance - Overview and Communications** | 1. Describe the risks and hazards involved when preparing equipment for routine maintenance.<br>2. Given a piece of equipment, describe the key activities necessary for preparing the equipment for routine maintenance.<br>• Shutdown<br>• Decontamination<br>• Isolation<br>• Lockout<br>3. Discuss all departments and personnel who will be involved in, or affected by, the equipment maintenance.<br>4. Discuss the types of information that will need to be communicated regarding the preparation of equipment for routine maintenance.<br>5. Discuss the communication methods that might be used at different points during the performance of routine maintenance. |
| **Equipment Maintenance - Economic Impact (preventive versus reactive)**<br><br>**Equipment Maintenance - Economic** | 1. Discuss the advantages of preventive maintenance with the disadvantages of reactive maintenance.<br>2. Discuss the types of preventive maintenance that should be performed on a piece of equipment.<br>3. Discuss the process technician's role in the performance of various preventive maintenance activities.<br>4. Propose a schedule for performing preventive maintenance for the selected piece of equipment.<br>5. Describe the types of expenses associated with preventive maintenance.<br>6. Describe the types of expenses associated with reactive maintenance.<br><br>7. Compare the economic impact associated with preventive maintenance versus reactive maintenance.<br>8. Describe the types of reactive maintenance that may be required in |

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| **Impact (preventive versus reactive) (cont.)** | the absence of a preventive maintenance program. |
| **Equipment Maintenance - SH&E Impact** | 1. Provide examples of possible safety issues surrounding equipment maintenance activities:<br>• Breaking into piping or equipment<br>• Vessel entry<br>• Electrical work<br>• Hot tapping, etc.<br>2. Describe measures to take to minimize the safety issues surrounding equipment maintenance such as:<br>• Confined space entry<br>• Energy/Equipment isolation<br>• Equipment Decontamination<br>• Equipment identification<br>• Fall protection<br>• Barricades<br>• Proper communication<br>3. Discuss examples of possible health issues surrounding equipment maintenance (such as exposure to hazardous materials).<br>4. Discuss measures to take to minimize the health issues surrounding equipment maintenance such as.<br>• Proper use of PPE<br>• Issuance of all necessary permits<br>• decontamination<br>5. Discuss possible environmental issues surrounding equipment maintenance such as:<br>• Leaks<br>• Spills<br>• Contaminated equipment<br>• Chemical waste<br>6. Describe measures to take to minimize the environmental issues surrounding equipment maintenance.<br>• Waste disposal<br>• Spill cleanup<br>• Housekeeping<br>• Proper decontamination |
| **Equipment Maintenance - Documentation and Permits**<br><br>**Equipment Maintenance - Documentation and Permits (cont.)** | 1. Discuss the types of documentation that must be completed prior to performing maintenance on a selected piece of equipment.<br>2. Discuss the role the process technician may have in preparing each type of documentation.<br>3. Explain the purpose of a work permit.<br>4. List the various types of work permits used within the process industries.<br>5. List the departments or groups that may need to be consulted and/or sign a work permit. |

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| **Equipment Maintenance - Equipment Isolation** | 1. Differentiate between energy sources and devices used for isolation.<br>2. Discuss the methods used to clear equipment.<br>3. Describe the purpose of various PPE (Personal Protective Equipment) used during equipment clearing and isolation.<br>4. Identify the appropriate PPE (Personal Protective Equipment) for use in a specific clearing and isolation scenario. |
| **Turnarounds** | 1. Define the term "turnaround".<br>2. Differentiate between routine maintenance and work performed during turnaround.<br>3. Given a scenario, list the tasks which must be completed and discuss the process technicians role to adequately prepare for a turnaround.<br>4. Compare and contrast routine shutdown versus shutting down for turnaround.<br>5. Describe the role of the process technician in unit turnarounds.<br>6. Compare and contrast routine startup versus starting up after turnaround.<br>7. Discuss PSM's Management of Change requirements in relationship to turnarounds.<br>8. Discuss the PSM's Pre-Startup Safety Review requirements in relationship to turnarounds.<br>9. Given a scenario, list the tasks which must be completed and discuss the process technicians role for successful startup following a turnaround.<br>• Removal of energy isolation devices<br>• Purging<br>• Pressure testing of equipment<br>• Vessel and/or piping inventory<br>• Installation of plugs, caps, blind flanges, etc.<br>10. Explain how unit personnel would evaluate the success of a turnaround.<br>• Zero injuries<br>• Zero environmental incidents<br>• Successful startup<br>• On time and on budget<br>• Improved plant performance |

## III. STUDENT LEARNING OUTCOMES

| OUTCOMES | METHOD OF ASSESSMENT |
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| 1. Using process diagrams (P&IDs, PFDs) and operating procedures describe how an operator would startup and operate a plant under normal operating conditions. | Lab assignment during semester. |
| 2. Describe the major steps performed during startup (initial commissioning, routine startup, and startup following a turnaround) of a process to meet normal operating conditions, including safety and environmental regulations. | Final exam questions. |
| 3. Demonstrate roles and responsibilities of a process technician during normal operating activities (shift change, monitoring controls and equipment, sampling, communications, etc.). | Operations questions on final exam. |
| 4. Given an abnormal situation, identify appropriate corrective actions to return the process to either a steady-state operation or perform a safe emergency shutdown. | Lab exercise during the semester. |
| 5. Describe the major steps performed during normal shutdown activities, including meeting safety and environmental regulations. | Operations final exam questions. |
| 6. Describe steps taken to safely prepare equipment for both routine and shutdown maintenance activities (e.g., isolation, decontamination, permitting) and then returning equipment to service. | Operations final exam questions. |

**SKILL STANDARDS LEARNING OUTCOMES**

**The following list of learning outcomes are Key Activities from the Chemical/Refining Process Technician skill standards, developed by the North American Process Technology Alliance (NAPTA), and recognized by the Texas Skill Standards Board (TSSB). These outcomes have been integrated into PTAC 2438, Process Technology III - Operations.**

1. **Monitor and Regulate Distillation System.**
2. **Monitor and Regulate Continuous Reaction System**
3. **Monitor and Regulate Steam System.**
4. **Monitor and Regulate Utility Air System.**
5. **Receive Chemical Materials**
6. **Store Chemical Materials**

## IV. TEXTBOOK OR COURSE MATERIAL INFORMATION

### A. Textbook

1. Process Training Using the P.E.T. - Safety & Exercises, Willis, BC Custom Publisher, Jan. 2019 (required)
2. Process Training Using the P.E.T. – Procedures, Willis/Colwell/Mergenhagen/Farrar/Curry, BC Custom Publisher, August 2020 (required)
3. Process Training using the P.E.T. Simulator Procedures and Problems, Willis/Colwell/Mergenhagen, BC Custom Publisher, July. 2018 (required)
4. Hardhat (required)
5. Laminated Sheets (required)
6. Package of Black fine point dry erase markers (required)
7. Safety Glasses (required)

Required course materials are available at the Brazosport College bookstore, on campus or online at http://brazosport.edu/bookstore/home.html. 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://brazosport.edu/bookstore/home.html

Process Technology III - Operations is one of the core courses in the Process Technology Degree. The two-year program has been created to train students for careers as Process Technicians in the chemical and refining process industries.

Process Technology III – Operations combines systems into operational processes with emphasis on operations under various conditions. Topics include typical duties of an operator. Laboratory exercises include the operation of a life-size distillation unit (Process Equipment Trainer). This course is considered to be a capstone course.

**B. Course Outline**

**This is a sample outline which may vary with individual instructors. It will also vary based on whether the course is a summer course or a fall/spring course. Students should contact their instructor for the outline of the course they are taking.**

| WEEK # | TOPIC |
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| **1** | Course Overview, Introduction to Operations<br>The Operating Unit |
| **2** | Initial Unit Startup - Major Activities<br>Normal Startup - Overview and Communication |
| **3** | Normal Startup - Equipment Inspection<br>Normal Startup - Removal of Energy Isolation Devices |
| **4** | Procedure Writing<br>Normal Startup - Utilities and Auxiliaries |
| **5** | Normal Startup - Utilities and Auxiliaries<br>Normal Startup - Process Unit |
| **6** | Normal Startup - Process Unit<br>Exam #1 Review |
| **7** | **Exam #1**<br>Normal Ops – Monitor Unit (Overview)<br>Normal Ops – Monitor Unit (Field Tech)<br>Normal Ops – Monitor Unit (Board Tech) |
| **8** | Normal Ops - Other Duties<br>Normal Ops - Comply with SH&E Policies<br>Normal Ops - Verbal Communication |
| **9** | Normal Ops - Written Communication and Shift Change<br>Exam #2 Review |
| **10** | **Exam #2**<br>Abnormal Ops - Emergency Operations and Emergency Situations<br>Abnormal Ops - Table Top Drill |
| **11** | On-The-Job Training<br>Normal Shutdown - Overview and Communications |
| **12** | Normal Shutdown - Shutdown Unit<br>Equipment Maintenance - Overview and Communications |
| **13** | Equipment Maintenance - Economic Impact<br>Equipment Maintenance - SH&E Impact |
| **14** | Equipment Maintenance - Documentation and Permits<br>Equipment Maintenance - Equipment Isolation |
| **15** | Turnarounds<br>Take Home Test |

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| **16** | Course Project - Conducting an OJT Session<br>Course Project - Conducting an OJT Session<br>Course Project - Conducting an OJT Session |

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

## V. LAB REQUIREMENTS

Each class session will begin with a lecture, followed by a lab session. Each student is expected to keep up with the schedule and be prepared to participate in each class. Additionally, there is normally a quiz to complete following each class, unless noted otherwise on the detailed schedule in APPENDIX C. **For lab sessions**, students will work in teams according to shift assignment. **Students must make at least a "D" in the lab portion of this course in order to pass the course.**

## VI. 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.

## VII. 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.

## VIII. 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/.

## IX. 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).

## X. COURSE REQUIREMENTS AND GRADING POLICY TESTING MAKE-UP POLICY

Exams: There are 4 drawing exams, 2 skills exams, and a final exam on scantron. Each exam will last approximately thirty minutes to one hour during class. The exact date of each exam will be announced in class prior to the actual date of the exam, and is noted in your schedule.

Check Your Knowledge: Quizzes: Check Your Knowledge quizzes will be given during the semester. Questions will come from lecture, plant operation, simulator excercises, and recall from previous equipment and instrument classes – remember this is a capstone course.

Attendance: Attendance will be taken for each class. Lecture and lab are considered one class and absences for either count as an absence for that day. Attendance counts as part of the final grade. **Leaving early without instructor permission will result in an absence**

Lab: The laboratory portion of the course consists of a 3 hour lab per week which the student must attend. The lab grade counts as 40% of the final grade. The grade will be determined by two skills tests given toward the end of the semester, completion of blue book exercises, and completion of assigned simulator book exercises and a minimum of 10 hours recorded time working on Simulator exercises. The student must demonstrate competency in operating the Process Equipment Trainer as will be determined by a skills test and personal observation during the semester.

Final Exam: The final will be given at the end of the course. The final exam is comprehensive and counts as 20% of the final grade. It consists of two parts: a simulator portion and a comprehensive portion.

Each of the above requirements counts toward your final grade as follows:

**A. Grading:**

| | |
|---|---|
| Exams | 40% |
| Lab | 40% |
| Final | 20% |
| Total | 100% |

Final Comprehensive Exam

Grades are assigned as follows:

| Grade | Final Average |
|---|---|
| A | 90-100 |
| B | 80-89 |
| C | 70-79 |
| D | 60-69 |
| F | Below 60 |

### B. Make-Up Policy

**There will be no make-up exams or quizzes for unexcused absences. A missed exam or quiz is a ZERO.** Rescheduling ahead of class start time is acceptable for exams and quizzes. **Exam makeups will be at time of final**.

## XI. 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.

## XII. COVID-19 STATEMENT

At Brazosport College, all of us, including faculty, staff, and students, share a common goal this fall semester, to keep our classes running in the safest manner possible and avoid any disruption to your progress in achieving your educational and career goals. To that end, we ask and encourage you to conduct yourself in the following manner while on campus this semester:

- Every day, perform a self-health check prior to coming to campus and stay home if sick.
- To the greatest extent possible, maintain your distance between you and other students, faculty, and staff while on campus.
- Wear a properly fitted face covering over your mouth and nose while indoors on campus. If you do not have a mask, they will be available to you in all classrooms this fall.
- Practice good hygiene, washing your hands regularly and/or using hand sanitizer.
- The most effective way to protect yourself from Covid-19 is through vaccination. The vaccine is readily available and at no cost to you. Vaccine information and availability can be found at https://brazosport.edu/coronavirus/vaccine/.

If at any time this semester you begin to experience Covid symptoms, or if you are exposed to someone who has tested positive for Covid-19, please take the following steps:

- Stay home if you're feeling sick and minimize your contact with others.
- Alert the College by completing the Covid-19 Exposure Report Form online at https://brazosport.edu/coronavirus/report/. Be sure to provide accurate contact information, including a working phone number that you will answer.

- After submitting the report, you will be promptly contacted by a member of our Rapid Response Team, who will ask you some specific questions about your situation and provide you with guidance moving forward.
- If it is determined that you should not come to class, your instructor will be notified. **Please know that your instructor will consider course adjustments and potential make-up work only if your case has been reported to Brazosport College, and they've been notified by our response team.** Your instructor will work with you to determine how to manage any make-up work.

The Community Health Network (CHN) Clinic at Brazosport College (located in BC Central B-Wing) is scheduled to be open from 8 AM to 6 PM Tuesday through Thursday during the Fall 2021 semester. While walk-ins are available, your visit will be easier if you pre-register by creating an account at www.mychn.org. In addition to providing health and behavioral services, CHN also provides COVID vaccinations and testing. All insurance is accepted, and healthcare is provided on a sliding scale including no cost for those who need it.

Throughout the semester, please regularly check the College's Covid-19 information page at https://brazosport.edu/coronavirus/, where the latest updates and guidelines will be posted. As members of the BC community, all of us share a responsibility to each other to be as safe as possible.

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## 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. This is a capston course for the Process Technology Program and a stepping stone into the process tech role. You are expected to conduct yourself with safety considerations for you and your fellow students, communicate, as well as treat your fellow students with respect and responsibility. 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 the classroom setting and cannot be made up by reading the textbook. Therefore, class participation is essential to your learning and attendance will be taken. If you have five (5) unexcused absences you will be dropped from the class.

**b. Homework:**
As a standing homework assignment, students need to prepare for each session based on the class schedule. Thereafter, students should review what they learned in the class (review forward, read, review back).

**c. Class Participation**
Understand the syllabus requirements and refer to it for questions. If still unclear, contact the instructor. Also, the participation grade is based on the quality (not frequency) of contribution. Those receiving high grades in class participation will be those who: a) Prepared for class; b) Arrive for class on time; c) Maintain excellent attendance; d) Make comments and ask questions that significantly contribute to the learning environment of the class; and e) Participate in plant exercise and demonstrations. Each student will earn **100 points** per class according to **APPENDIX B**, and points will accrue over the semester. Students will give peer feedback to the instructor at the end of the semester.

**d. Logbook (Lab):**
For plant exercises, students will be divided into shifts with 3 to 5 students per shift, depending on the class size. Each shift will to maintain a complete and accurate logbook. Logbook entries will be completed during and at the end of the lab.

**e. Learning Journal**
Each student is encouraged to maintain a learning journal throughout the course. This journal should include an entry for each class noting what was learned from reading, lecture, and lab. This journal will help with test preparations and serve as a reference for future PTAC classes and on the job.

**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 use their cell phone need to immediately discuss their situation with the instructor.**

**g. Safety Requirements**
Just as in the plants, safety will be treated of highest priority, even over completing any exercise. Students will follow the **PET Plant Safety Policy**. 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://brazosport.edu/students/for-students/places-services/library/about-the-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://brazosport.edu/students/for-students/places-services/learning-services/.

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://brazosport.edu/students/for-students/student-success-center/math-center/.

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.