Process Troubleshooting (PTAC 2446)

Credit: 4 semester credit hours (3 hours lecture, 3 hours lab)

Prerequisites: PTAC 2438

Course Description

Instruction in the different types of troubleshooting techniques, procedures, and methods used to solve process problems.

Required Textbook and Materials

1. *Troubleshooting for the Process Technicians* copyright 2009 by Michael Kukuk, Troubleshooting Resources.

Course Objectives

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

1. Collect data and identify techniques for troubleshooting.
2. Utilize applicable troubleshooting methods to solve process problems.

Course Outline

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

B. Preparation for Process Troubleshooting
   1. Introduction and performance Objectives
   2. Process Variables
   3. Process Instruments
   4. Process Instruments and Controllers
   5. Trouble shooting with controllers
   6. Troubleshooting tools
   7. Troubleshooting Steps

C. Troubleshooting a Decanter Process
   1. Introduction and Performance Objectives of Decanter Systems
   2. Decanter System Description
   3. Factors that Affect a Decanter System
   4. Decanter System Operation
   5. Decanter System Equipment and Instrument Lists
   6. Normal Decanter System Conditions
   7. Troubleshooting a Decanter System

D. Troubleshooting a Reaction Process
   1. Introduction and Performance Objectives of Reaction Systems
   2. Reaction System Description

3. Factors that Affect a Reaction System
4. Reaction System Operation
5. Reaction System Equipment and Instrument Lists
6. Normal Reaction System Conditions
7. Troubleshooting a Reaction System

E. Troubleshooting a Steam Generation Process
1. Introduction and Performance Objectives of a Steam Generation Process
2. Steam Generation Process System Description
3. Factors that Affect a Steam Generation Process
4. Steam Generation Process Operation
5. Steam Generation Process Equipment and Instrument Lists
6. Normal Steam Generation Process Conditions
7. Troubleshooting a Steam Generation Process

F. Troubleshooting a Distillation Process
1. Introduction and Performance Objectives of a Distillation Process
2. Distillation Process Description
3. Factors that Affect a Distillation Process
4. Distillation Process Operation
5. Distillation Process Equipment and Instrument Lists
6. Normal a Distillation Process Conditions
7. Troubleshooting a Distillation Process

G. Troubleshooting an Absorption and Stripping Process
1. Introduction and Performance Objectives of an Absorption and Stripping Process
2. Absorption and Stripping Process Description
3. Factors that Affect an Absorption and Stripping Process
4. Absorption and Stripping Process Operation
5. Absorption and Stripping Process Equipment and Instrument Lists
6. Normal Absorption and Stripping Process Conditions
7. Troubleshooting an Absorption and Stripping Process

Grade Scale

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation

Final grades will be calculated according to the following criteria:

Activity	*Percentage*
Homework/Labs	20%
Quizzes	20%
Exams	40%
Final Exam	60%

Course Requirements

1. Learn and apply the tools, steps, and methods for Process Troubleshooting.
2. Operate, equipment and instrumentation, normal data, and factor associated with a Decanter System.
3. Operate, objectives, equipment and instrumentation, normal data, and factor associated with a Reaction System.
4. Operate, objectives, equipment and instrumentation, normal data, and factor associated with a Waste heat Generation System.
5. Operate, objectives, equipment and instrumentation, normal data, and factor associated with a Distillation System.
6. Operate, objectives, equipment and instrumentation, normal data, and factor associated with an Absorbtion System.
7. Operate, objectives, equipment and instrumentation, normal data, and factor associated with a Stripping System.

Attendance Policy

1. Missing more than 20% of classes will result in an automatic “F” for the course.
2. Absences are counted for unexcused, excused and coming to class late.
3. Missing more than 20% of a class period will count as an absence.
4. Being tardy 2 times equals 1 absence.

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. If a test is missed due to an emergency situation, the student will have one week to make it up; otherwise a grade of 0 will be assigned. Students are responsible for scheduling the make-up date.

5. No cheating of any kind will be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result in expulsion from LIT.
6. A student who wishes to drop a course is responsible for initiating and completing the drop process. A student who stops coming to class, and fails to drop the course, will earn an "F" in the course.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the online resource: http://www.lit.edu/depts/stuserv/special/defaults.aspx

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office.

Course Schedule

Week	Topic	Reference
1	Course introduction and policies • Lecture • Lab policies • Introduction and performance Objectives	Handouts Chapter 1
2	• Process Variables • Process Instruments • Process Instruments and Controllers	Chapter 1
3/4	• Trouble shooting with controllers • Troubleshooting tools • Troubleshooting Steps	Chapter 1
5/6	• Introduction and Performance Objectives of Decanter Systems • Decanter System Description • Factors that Affect a Decanter System • Decanter System Operation • Decanter System Equipment and Instrument Lists • Normal Decanter System Conditions • Troubleshooting a Decanter System	Chapter 2

PTAC 2446
Course Syllabi

Week	Topic	Reference
	• Exam I	
7/8	• Introduction and Performance Objectives of Reaction Systems • Reaction System Description • Factors that Affect a Reaction System • Reaction System Operation • Reaction System Equipment and Instrument Lists • Normal Reaction System Conditions • Troubleshooting a Reaction System	Chapter 3
9/10	• Introduction and Performance Objectives of a Steam Generation Process • Steam Generation Process System Description • Factors that Affect a Steam Generation Process • Steam Generation Process Operation • Steam Generation Process Equipment and Instrument Lists • Normal Steam Generation Process Conditions • Troubleshooting a Steam Generation Process • Exam II	Chapter 4
11/12	• Introduction and Performance Objectives of a Distillation Process • Distillation Process Description • Factors that Affect a Distillation Process • Distillation Process Operation • Distillation Process Equipment and Instrument Lists • Normal a Distillation Process Conditions • Troubleshooting a Distillation Process	Chapter 5

13/14	• Introduction and Performance Objectives of an Absorption and Stripping Process • Absorption and Stripping Process Description • Factors that Affect an Absorption and Stripping Process • Absorption and Stripping Process Operation • Absorption and Stripping Process Equipment and Instrument Lists	Chapter 6

Week	Topic	Reference
	• Normal Absorption and Stripping Process Conditions • Troubleshooting an Absorption and Stripping Process • Exam III	
15/16	• Final Review Final • Exam	Chapters 1-6

9/14/2025

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

9/30/2025

B. Preparation for Process Troubleshooting
   1. Introduction and performance Objectives
   2. Process Variables
   3. Process Instruments
   4. Process Instruments and Controllers
   5. Trouble shooting with controllers
   6. Troubleshooting tools
   7. Troubleshooting Steps

10/15/2025

C. Troubleshooting a Decanter Process
   1. Introduction and Performance Objectives of Decanter Systems
   2. Decanter System Description
   3. Factors that Affect a Decanter System
   4. Decanter System Operation
   5. Decanter System Equipment and Instrument Lists
   6. Normal Decanter System Conditions

7. Troubleshooting a Decanter System

10/30/2025 D. Troubleshooting a Reaction Process

1. Introduction and Performance Objectives of Reaction Systems
2. Reaction System Description
3. Factors that Affect a Reaction System
4. Reaction System Operation
5. Reaction System Equipment and Instrument Lists
6. Normal Reaction System Conditions
7. Troubleshooting a Reaction System

11/15/2025 E. Troubleshooting a Steam Generation Process

1. Introduction and Performance Objectives of a Steam Generation Process
2. Steam Generation Process System Description
3. Factors that Affect a Steam Generation Process
4. Steam Generation Process Operation
5. Steam Generation Process Equipment and Instrument Lists
6. Normal Steam Generation Process Conditions
7. Troubleshooting a Steam Generation Process

11/22/2025 F. Troubleshooting a Distillation Process

1. Introduction and Performance Objectives of a Distillation Process
2. Distillation Process Description
3. Factors that Affect a Distillation Process
4. Distillation Process Operation
5. Distillation Process Equipment and Instrument Lists
6. Normal a Distillation Process Conditions
7. Troubleshooting a Distillation Process

11/29/2025 G. Troubleshooting an Absorption and Stripping Process

1. Introduction and Performance Objectives of an Absorption and Stripping Proce
2. Absorption and Stripping Process Description
3. Factors that Affect an Absorption and Stripping Process
4. Absorption and Stripping Process Operation
5. Absorption and Stripping Process Equipment and Instrument Lists
6. Normal Absorption and Stripping Process Conditions
7. Troubleshooting an Absorption and Stripping Process