

Syllabus

Course No.:	PPT 225-001
Course Name:	Plant Investigation and Troubleshooting Lecture
Semester:	Fall 2019
Credits:	2
Class Meetings:	B036: M, W 10:20-11:20 am
Instructor:	Andrew D. Sullivan
Phone:	247-3047
Email:	Andrew.Sullivan3@msubillings.edu
Faculty Website:	http://www.msubillings.edu/cotfaculty/sullivan/
Office:	A061 – Tech Building
Office Hours:	See attached schedule

Required Texts and Material:

There are no required textbooks to purchase. Required materials will be posted on D2L.

Prerequisites:

PPT 210 - Equipment and Operations Lecture.

Course Description:

Provides the student with an overview of the various troubleshooting models used by process technicians. Process troubleshooting involves different types of troubleshooting techniques, procedures, and methods used to solve process problems. Topics include application of data collection and analysis, cause-effect relationships, and reasoning. The student is exposed to many different trouble situations similar to those encountered in the process plant experience. The student is taught a systematic way to solve problems, using measured process variables and personal knowledge of how they affect each other (cause and effect).

Course Goals and Objectives:

Upon completing this unit, students will be able to:

1. Analyze how equipment and instrument malfunctions affect a system.
2. Evaluate how a malfunction in one system will affect other systems.
3. Detect problems using monitoring equipment, data from a plant historian, and specially collected data. Analyze a problem's potential consequences, and communicate the situation effectively to the proper authorities.
4. Develop a prioritized list of possible causes or theories for abnormal operations using troubleshooting methods for a wide range of scenarios. Develop and implement plans to test hypotheses by collecting data and reconciling it to troubleshooting theories. Interpret the data and judge if the data supports or refutes a theory, and modify the theory as needed. Determine the root cause and develop corrective actions for the short, medium, and long term.

Misconduct:

Academic or personal misconduct will be managed per the procedures outlined in the [MSU Billings Student Policies & Procedures Handbook](#).

Be careful about cheating and plagiarism. Sending a classmate your electronic files is a risk. Excel and Visio are examples. I have seen several times where the same file gets handed in by two students. Copying answers in online homework is another area to watch.

Exhibit professional behavior. It is important that we provide a campus conducive to academic development. Repeated disruptive behavior will be documented and result in final grade reductions up to 10% per occurrence depending on severity.

Cell Phones and Electronic Devices:

Electronic devices including phones, computers, and tablets are distracting to the class and not allowed. Silenced phones are allowed if you politely step out of the room to take a call.

Access, Assistance, and Advocacy:

Your success in a positive, supportive, and enjoyable learning environment is my primary objective and the University's. Please let me know if there are barriers that I can help to address. We have one of the strongest support networks of any university to help. A summary of services is listed below. You can work with them directly or involve me as you prefer.

- [Academic Support Center](#). The City College branch is open M-F 9-5. Resources include tutoring and a writing center. Drop-in and by appointment. 247-3022.
- [Disability Support Services \(DSS\)](#). MSU Billings is committed to providing equal access. Please meet with me to discuss ways to ensure your full participation if you anticipate barriers. DSS will help us (247-3029, Tech Building A011).
- [TRIO/Student Support Services](#). Support for low income, first generation, and disabled students enrolled in a 4 year program (or 2+2 at City College). 657-2162
- [Native American Achievement Center](#). Advocacy and assistance for American Indian students. 657-2144
- [Student Health Services](#). Student Health Services provides medical care, mental health counseling, wellness services and education, and violence advocacy and prevention services. Located above the Academic Support Center at City College. Open M:11-2, T:9-12, W:11-2, and Th:1-5. Students can use Health Services even if they waive the student health insurance plan. 657-2153
- [Veterans Services](#). For assistance activating your VA Educational Benefits, getting access to VA assistance for tutors, or even joining the veteran student organization contact the VA Representative in the Military and Veterans Success Center, Dawn Githens, at 657-

2982. For assistance on the posting of your VA Educational benefits please contact Renee Haefer in the Business Services office at 657-1707.

- [Veterans Upward Bound](#). Assistance for veterans from admission to graduation. 657-2075

Safety:

Some hazards can't be eliminated in a process plant or laboratory setting and must be managed to prevent serious injury. A discussion of hazards and how to mitigate them will be part of every lab and will include safely equipment checks, personal protective equipment requirements, and training. Student responsibilities include:

- Be fully engaged so you understand the hazards and are prepared to manage them.
- Be in a suitable physical and mental state to perform safely and determine if you are prepared to engage in an activity.
- Wear all required PPE for the activity. Safety glasses are always required in the lab. No open-toe shoes are allowed in the lab.
- Perform safely and professionally. Horseplay gets people hurt.
- Follow all laboratory rules and procedures. No food or drinks in the lab is an example.

Failure to follow safety rules may result in a written warning, a failing grade for the assignment or course, or loss of laboratory privileges to protect other students. MSUB is not responsible for injury resulting from failure to follow rules or procedures.

Academic Issues and Grading:

1. Late work is not accepted.
2. Final lecture grades will be calculated per the following scoring criteria:

Tests (average of 3 evenly split)	60%
Weekly Homework Assignments	40%

3. Grade Scale:

Grade	Percentage	GPA
A	93 - 100	4.0
A-	90 - 93	3.7
B+	87 - 90	3.3
B	83 - 87	3.0
B-	80 - 83	2.7
C+	77 - 80	2.3
C	73 - 77	2.0
C-	70 - 73	1.7
D+	67 - 70	1.3
D	63 - 67	1.0
D-	60 - 63	0.7

F	0 - 60	0.0
---	--------	-----

Course Outline:

The following plan is a guideline that will be adjusted to meet the needs of the class.

Week	Day	Class	Class Topic / Plan
1	Wed 09/04/19	1	Temperature indicators, transmitters, and TI guns
2	Mon 09/09/19	2	DP Transmitters for Pressure, Flow, and Level Measure
	Wed 09/11/19	3	Level transmitters
3	Mon 09/16/19	4	Position sensors
	Wed 09/18/19	5	Using instruments to predict malfunctions
4	Mon 09/23/19	6	Valves - Safety, Control, Check, Block, Globe.
	Wed 09/25/19	7	Clearing a line
5	Mon 09/30/19	8	Winterization
	Wed 10/02/19	9	Pumps
6	Mon 10/07/19	10	Test #1
	Wed 10/09/19	11	Pumps
7	Mon 10/14/19	12	Furnaces
	Wed 10/16/19	13	Furnaces
8	Mon 10/21/19	14	Heat Exchangers
	Wed 10/23/19	15	Heat Exchangers
9	Mon 10/28/19	16	Distillation Towers
	Wed 10/30/19	17	Distillation Towers
10	Mon 11/04/19	18	Compressors
	Wed 11/06/19	19	Compressors
11	Mon 11/11/19		Veterans Day NO CLASSES
	Wed 11/13/19	20	Test #2
12	Mon 11/18/19	21	Filters / Coalescers
	Wed 11/20/19	22	Amine units
13	Mon 11/25/19	23	Merox units
	Wed 11/27/19		Thanksgiving Holiday NO CLASSES
	Thu 11/28/19		Thanksgiving Holiday NO CLASSES
	Fri 11/29/19		Thanksgiving Holiday NO CLASSES
14	Mon 12/02/19	24	FCC units
	Wed 12/04/19	25	FCC units
15	Wed 12/11/19		Final Exam. 10:00-12:00.

Fall 2019 Andy's Schedule

	Mon	Tue	Wed	Thu	Fri
8:00-9:00	PPT 211-001 Advanced Operations 8:00-9:00 – B036		PPT 211-001 Advanced Operations 8:00-9:00 – B036	PPT 102-101 Intro to PPT Lab 8:00-10:00 – A062	
9:00-10:00	Office Hours	PPT 212-101 Advanced Ops Lab 9:10-11:10 – A062	Office Hours		Office Hours
10:00-11:00	PPT 225-001 Troubleshooting 10:20-11:20 – B036		PPT 225-001 Troubleshooting 10:20-11:20 – B036	Office Hours	
11:00-12:00					
12:00-1:00		PPT 151-001 PPT Safety I 11:30-12:30 – B036	PPT 130-001 Diagrams 11:30-12:30 – B012	PPT 151-001 PPT Safety I 11:30-12:30 – B036	
1:00-2:00	CSCI 181 Web Design 12:40-1:40 – B056	CSCI 181 Web Design 12:40-1:40 – B056	CSCI 181 Web Design 12:40-1:40 – B056	CSCI 181 Web Design 12:40-1:40 – B056	CSCI 181 Web Design 12:40-1:40 – B056
2:00-3:00	PPT 101-001 Intro to Proc Tech 1:50-2:50 – B036	PPT 101-001 Intro to Proc Tech 1:50-2:50 – B036	PPT 101-001 Intro to Proc Tech 1:50-2:50 – B036	PPT 101-001 Intro to Proc Tech 1:50-2:50 – B036	Office Hours
3:00-4:00	PPT 102-100 Intro to PPT Lab 3:00-5:00 – A062	Office Hours	PPT 212-100 Advanced Ops Lab 3:00-5:00 – A062	PPT 102-102 Intro to PPT Lab 3:00-5:00 – A062	
4:00-5:00					