

Syllabus

Course Numbers:	PPT 175-001 (Lecture) PPT 176-100 (Lab) PPT 176-101 (Lab) PPT 176-102 (Lab)
Course Name:	Process Plant Sciences Lecture and Lab
Semester:	Spring 2020
Credits:	Lecture: 4, Lab: 1
Lecture Meetings:	B036: MTWR 9:10-10:10 am
Lab Meetings:	Section 100: A063: T 1:50-3:50 pm Section 101: A063: R 1:50-3:50 pm Section 102: A063: F 11:30-1:30 pm
Instructor:	Andrew D. Sullivan
Phone:	247-3047
Email:	Andrew.Sullivan3@msubillings.edu
Faculty Website:	http://www.msubillings.edu/cotfaculty/sullivan/
Office:	A061
Office Hours:	See attached schedule.

Required Texts and Material:

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

Course Description:

Provides the fundamentals necessary for an in-depth look at the distillation process. Examines the concepts of heat and thermodynamics, as well as the chemical bonds, organic chemistry, the periodic table and hydrocarbon concepts. Gives students the necessary tools for a better understanding of the process taking place in the refining and power industries.

Course Goals and Objectives:

Upon completing this course, students will be able to:

1. Explain the physical and chemical principles that govern a range of operations in a process plant.
2. Apply physical and chemical principles to effectively operate processing equipment, optimize unit operations, and address malfunctioning equipment.
3. Analyze complex process systems, interpret the function of processing equipment, and evaluate how changes in processing conditions will impact operations.
4. Safely collect process samples, use laboratory skills to accurately measure physical and chemical properties, interpret results, and develop plans to adjust unit operations to correct properties outside target range.

Misconduct:

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

Cheating is taken very seriously in College. Sending a classmate your electronic files is cheating. Copying or allowing someone else to copy answers is cheating.

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.

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 academic setting and must be managed to prevent serious injury. A discussion of hazards and how to mitigate them will be part of lectures, labs, and other activities and will include safety 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. 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 rules and procedures.

Failure to follow safety rules may result in a written warning, a failing grade for the assignment or course, or loss of laboratory / activity 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. It isn't fair to the rest of the class to make exceptions. It is possible that a due date might be extended for the whole class beforehand with appropriate class discussion.

2. Final lecture grades will be calculated per the following scoring criteria:

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

3. Final lab grades will be calculated according to the following scoring criteria:

Lab Assignments	100%
-----------------	------

Being on time, acting in a safe way, and participating in lab are required for full credit.

4. Grade Scale:

Grade	Percentage	GPA		Grade	Percentage	GPA
A	93 - 100	4.0		C	73 - 77	2.0
A-	90 - 93	3.7		C-	70 - 73	1.7
B+	87 - 90	3.3		D+	67 - 70	1.3
B	83 - 87	3.0		D	63 - 67	1.0
B-	80 - 83	2.7		D-	60 - 63	0.7
C+	77 - 80	2.3		F	0 - 60	0.0

Course Outline:

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

Week	Day	Class	Labs	Class Plan	Lab / Notes
1	Wed 01/15/20	1		Course Introduction / Mechanical Aptitude	
	Thu 01/16/20	2	1	Mechanical Aptitude	Lab 1 - Heat capacity part 1
	Fri 01/17/20		1		Lab 1 - Heat capacity part 1
2	Mon 01/20/20			Martin Luther King Day	
	Tue 01/21/20	3	1	Units, Dimensional Analysis, Sci Notation	Lab 1 - Heat capacity part 1
	Wed 01/22/20	4		Units, Dimensional Analysis, Sci Notation	
	Thu 01/23/20	5	2	Atoms and the Periodic Table	Lab 2 - Heat capacity part 2
	Fri 01/24/20		2		Lab 2 - Heat capacity part 2 (Dr. Edelman @ 11:50 am)
3	Mon 01/27/20	6		Resume Workshop for Refining	
	Tue 01/28/20	7	2	Molecules and Chemical Formula	Lab 2 - Heat capacity part 2
	Wed 01/29/20	8		Molecules and Chemical Formula	
	Thu 01/30/20	9	3	Molecules and Chemical Formula	Lab 3 - Freeze Point
	Fri 01/31/20		3		Lab 3 - Freeze Point
4	Mon 02/03/20	10		Molecules and Chemical Formula	
	Tue 02/04/20	11	3	Naming Compounds	Lab 3 - Freeze Point
	Wed 02/05/20	12		Naming Compounds	
	Thu 02/06/20	13	4	The Mole and Dimensional Analysis Practice	Lab 4 - Flash Point
	Fri 02/07/20		4		Lab 4 - Flash Point
5	Mon 02/10/20	14		Chemical Reactions / Types / Stoichiometry	
	Tue 02/11/20	15	4	Chemical Reactions / Types / Stoichiometry	Lab 4 - Flash Point
	Wed 02/12/20	16		Chemical Reactions / Types / Stoichiometry	
	Thu 02/13/20	17	5	Test #1	Lab 5 - Pump / Motor Lab
	Fri 02/14/20		5		Lab 5 - Pump / Motor Lab
6	Mon 02/17/20			Presidents' Day	
	Tue 02/18/20	18	5	Pre-employment Interviewing Skills	Lab 5 - Pump / Motor Lab
	Wed 02/19/20	19		Solutions and Concentrations	
	Thu 02/20/20	20	6	Properties of Gasses - The Ideal Gas Law	Lab 6 - Titration
	Fri 02/21/20		6		Lab 6 - Titration
7	Mon 02/24/20	21		Properties of Gasses - The Ideal Gas Law	
	Tue 02/25/20	22	6	Non-ideal Gases and Steam Tables	Lab 6 - Titration
	Wed 02/26/20	23		Heat of reaction	
	Thu 02/27/20	24	7	Heat of reaction	Lab 7 - Heat of Reaction
	Fri 02/28/20		7		Lab 7 - Heat of Reaction
8	Mon 03/02/20			Spring Break	
	Tue 03/03/20			Spring Break	
	Wed 03/04/20			Spring Break	
	Thu 03/05/20			Spring Break	
	Fri 03/06/20			Spring Break	
9	Mon 03/09/20	25		Advising	
	Tue 03/10/20	26	7	Nature of electrons. Ionic & covalent bonds	Lab 7 - Heat of Reaction
	Wed 03/11/20	27		Sensible and Latent Heat	
	Thu 03/12/20	28	8	Surface tension, mixing, and soaps	Lab 8 - Steam Distillation
	Fri 03/13/20		8		Lab 8 - Steam Distillation
10	Mon 03/16/20	29		Distillation / Registration for fall 2020	
	Tue 03/17/20	30	8	Distillation	Lab 8 - Steam Distillation
	Wed 03/18/20	31		Distillation	
	Thu 03/19/20	32	9	Distillation	Lab 9 - D-86 Distillation
	Fri 03/20/20		9		Lab 9 - D-86 Distillation
11	Mon 03/23/20	33		Distillation	
	Tue 03/24/20	34	9	Distillation	Lab 9 - D-86 Distillation
	Wed 03/25/20	35		Test #2 Review	
	Thu 03/26/20	36	10	Test #2	Lab 10 - Combustion Efficiency
	Fri 03/27/20		10		Lab 10 - Combustion Efficiency
12	Mon 03/30/20	37		Chemical Kinetics	
	Tue 03/31/20	38	10	Chemical Kinetics	Lab 10 - Combustion Efficiency
	Wed 04/01/20	39		Chemical Kinetics	

Process Plant Technology

	Thu 04/02/20	40		11		Chemical Kinetics	Lab 11 - Biodiesel
	Fri 04/03/20				11		Lab 11 - Biodiesel
13	Mon 04/06/20	41				Chemical Kinetics	
	Tue 04/07/20	42	11				Lab 11 - Biodiesel
	Wed 04/08/20	43				Biodiesel	
	Thu 04/09/20					Spring Mini Break	
	Fri 04/10/20					Spring Mini Break	
14	Mon 04/13/20	44				Biodiesel	
	Tue 04/14/20	45	12			Solution Equilibrium / 66 City College Visit	Lab 12 - Extraction
	Wed 04/15/20	46				Solution Equilibrium	
	Thu 04/16/20	47		12		Industrial Caffeine Extraction	Lab 12 - Extraction
	Fri 04/17/20				12	Creativity Conference (11 setup. 1:30-3:00)	Lab 12 - Extraction
15	Mon 04/20/20	48				Acids and Bases, pH	
	Tue 04/21/20	49	13			Acids and Bases, pH	Lab 13 - Crystallization
	Wed 04/22/20	50				Chemical Equilibrium	
	Thu 04/23/20	51		13		Course Review	Lab 13 - Crystallization
	Fri 04/24/20					University Day	
16	Wed 04/29/20					Final Exam - 9:00-11:00am	

Andy's Spring 2020 Calendar

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-9:00	Office Hours	Office Hours	Office Hours	Office Hours	Office Hours
9:10-10:10	PPT 175	PPT 175	PPT 175	PPT 175	
10:20-11:20	PPT 120	PPT 161	PPT 120	PPT 161	Lunch
11:30-12:30	Lunch	Lunch	Lunch	Lunch	PPT 176
12:40-1:40	CSCI 214	CSCI 214	CSCI 214	CSCI 214	
1:50-2:50	Office Hours	PPT 176	Office Hours	PPT 176	Office Hours
3:00-4:00					
4:10-5:10		Office Hours		Office Hours	