

Syllabus

Course No.:	PPT 211-001 PPT 212-100 PPT 212-101
Course Name:	Advanced Operations Lecture and Lab
Semester:	Fall 2019
Credits:	Lecture: 2, Lab: 1
Lecture Meetings:	B036: M, W 8:00-9:00 am
Lab Meetings:	A062: W 3:00-5:00 pm (Section 100) A062: T 9:10-11:10 am (Section 101)
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:

Introduces the student to actual refining processes, taking an in-depth look at each process, as well as the unit variables, equipment, critical control areas, product and unit specific safety considerations. Various types of processes are discussed, including Fluid Catalytic Cracking, Alkylation, Catalytic Reforming, Desulfurization, Crude/Vacuum Systems, Amine, Coking, and Hydro treating. The course is also designed to provide classroom time balanced with field review of the various processes.

Course Goals and Objectives:

Upon completing this unit, students will be able to:

1. List and Identify processes important in refining and describe their function.
2. Explain how refinery processes work, how major equipment is utilized in the process, unit feeds and products, how chemical principles apply, how the unit is controlled, how the unit integrates into a refinery, and unit specific safety, operability, and product quality considerations.
3. Apply their knowledge of refining and process operations to construct simplified process flow diagrams for major refinery processes from memory and overall refinery flow plans.

4. Analyze how a change in a process operation will impact product qualities at the unit level and at the overall refinery level, evaluate the relative benefits and costs for the change based on their knowledge of refinery economics, and justify if the change is beneficial or not.

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

Average of individual lab grades	100%
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4. 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	Lab	Lab	Class Topic / Plan	Lab
1	Wed 09/04/19	1		1	Refinery Configuration	D-86 Distillation
2	Mon 09/09/19	2			Refinery Configuration	
	Tue 09/10/19		1			D-86 Distillation
	Wed 09/11/19	3		2	Refinery Configuration	Binary Distillation Optimization
3	Mon 09/16/19	4			Petroleum Characteristics	
	Tue 09/17/19		2			Binary Distillation Optimization
	Wed 09/18/19	5		3	Petroleum Characteristics	Binary Distillation Startup
4	Mon 09/23/19	6			Product Blending	
	Tue 09/24/19		3			Binary Distillation Startup
	Wed 09/25/19	7		4	Multi-Draw Distillation	Gasoline Blending (A70?)
5	Mon 09/30/19	8			Multi-Draw Distillation	
	Tue 10/01/19		4			Gasoline Blending (A70?)
	Wed 10/02/19	9		5	Test #1	SS - ADU (What-If)
6	Mon 10/07/19	10			Lt Ends / Gas Processing	
	Tue 10/08/19		5			SS - ADU (What-If)
	Wed 10/09/19	11		6	Lt Ends / Gas Processing	SS - ADU (Optimization)
7	Mon 10/14/19	12			Water Treating	
	Tue 10/15/19		6			SS - ADU (Optimization)
	Wed 10/16/19	13		7	Water Treating	Boiler Startup and Steam Trap Operation
8	Mon 10/21/19	14			Amine Systems	
	Tue 10/22/19		7			Boiler Startup and Steam Trap Operation
	Wed 10/23/19	15		8	Amine Systems	Boiler Water Chemistry
9	Mon 10/28/19	16			FCC units	
	Tue 10/29/19		8			Boiler Water Chemistry
	Wed 10/30/19	17		9	FCC units	Amine Operations (skim a drum)
10	Mon 11/04/19	18			FCC units	
	Tue 11/05/19		9			Amine Operations (skim a drum)
	Wed 11/06/19	19		10	Test #2	SPM-2400 FCCU (What-If)
11	Mon 11/11/19				Veterans Day NO CLASSES	
	Tue 11/12/19		10			SPM-2400 FCCU (What-If)
	Wed 11/13/19	20		11	Coking	Furnace Restart
12	Mon 11/18/19	21			Coking	
	Tue 11/19/19		11			Furnace Restart
	Wed 11/20/19	22		12	Merox	SPM-2400 FCCU (Max Naphtha)
13	Mon 11/25/19	23			Merox	
	Tue 11/26/19		12			SPM-2400 FCCU (Max Naphtha)
	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			Ethanol Plants	
	Tue 12/03/19		13			Renewable Fuels Production
	Wed 12/04/19	25		13	Ethanol Plants	Renewable Fuels Production
15	Wed 12/11/19				Final Exam. 8-10 am.	

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		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	
12:00-1:00					
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					