

# EECE 405 – Unit Operations Laboratory Syllabus – Fall 2021

Lecture: Wednesday 12-12:50 pm, Jubel 120

Lab: One day/week, 1-4:50 pm, Brauer 007

**Instructor:** Dr. Janie Brennan

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**Office hours:** Friday 11 am-12:30 pm or by appointment (Zoom and Brauer 3002)

**Instructor:** Dr. Trent Silbaugh

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**Office Phone:** 314-935-6014

**Office hours:** Friday 12:30 – 2 pm or by appointment (Zoom and Brauer 3028)

## **Assistants to Instructors:**

**Office hours:** Available only by appointment

<b>Assistant Name</b>	<b>Email</b>
Name1	Email1@wustl.edu
Name2	Email2@wustl.edu
Name3	Email3@wustl.edu

## **Course Resources:**

Canvas (<http://wustl.instructure.com>) will be our Learning Management System for this course. All announcements, course materials, grades, and assignment drop boxes will be available there.

Engineering resources that will be of use for your projects can be found at the following website provided by the WUSTL Libraries: <http://libguides.wustl.edu/eece405>

For any questions regarding course *concepts* or logistics, we will be using Piazza. Please post your questions on the course's Piazza page and direct your questions either to the whole class or only to the instructors. If you wish, you may post anonymously. Note that posting any form of a design or experimental solution to the unit operations projects is **strictly prohibited**, and will be treated as academic misconduct. However, questions about the theory behind the unit operations (e.g., "What does this paragraph in this textbook mean?"), about course logistics, etc. are more than welcome! This course's Piazza page can be accessed directly through Canvas.

## **Course Objectives (students who complete this course should be able to):**

1. Explain the general theories and principles important to chemical engineering and use these concepts in the analysis of chemical engineering processes and unit operations.
2. Apply effective engineering experimentation techniques and safety procedures common in the chemical industry.
3. Describe how chemical engineering processes and unit operations are useful in chemical production industry and other related industries.
4. Write and present reports effectively summarizing experimental procedures, observations, results, and conclusions.
5. Demonstrate effective skills necessary for group work.

## Course Schedule:

Following two initial weeks, the course will be organized as three multi-week lab units. The first 2-3 weeks of each unit will be open lab time to work on the lab assignment. The following session of each unit will consist only of oral presentations. One week later, your final written deliverable will be due, along with peer evaluations. See the last page of the syllabus for more details on team assignments and lab schedule. For each lab, each group should complete a prelab assignment, a mid-unit check-in, safety observations (one per lab period), an oral presentation, a full lab report or memo, as well as a peer feedback survey. These items are due as noted in the schedule below.

Week	Dates	Lecture Period	Unit # - Session #	Deliverable(s)*
1	Aug 30-Sept 3	Course Introduction, Using the Libraries, Process Safety & HAZOP	No lab	<u>Prior to 1<sup>st</sup> lecture:</u> Complete Canvas Orientation Module including completion quizzes
2	Sept 6-10	Data Analysis & Experimental Design Practice	Lab Open House: Wed, Thurs, & Fri 1-2:30 pm ( <i>Attend one session</i> )	<u>Prior to lecture:</u> Turn in Safety Form & Team Contract, watch videos on Data Analysis & Experimental Design
3	Sept 13-17	Tech. Communication Pt. 1	1 – 1 (open lab time)	Prelab 1
4	Sept 20-24	Tech. Communication Pt. 2	1 – 2 (open lab time)	Mid-Unit Check-in 1
5	Sept 27-Oct 1	Tech. Communication Pt. 3	1 – 3 (open lab time)	
6	Oct 4-8	Safety Observation Check-In, Peer Feedback	1 – 4 (no lab)	Oral Presentation 1**
7	Oct 11-15	<i>N/A (Fall Break Mon/Tues)</i>	No class (Section A) 1 – 5 (no lab, Sections C/D)	<u>Sections C/D:</u> Lab Report 1 Peer feedback 1 (24 h later)
8	Oct 18-22	<i>N/A</i>	1 – 5 (no lab, Section A) 2 – 1 (lab, Sections C/D)	<u>Section A:</u> Lab Report 1 Peer feedback 1 (24 h later) <u>Sections C/D:</u> Prelab 2 Team Contract Revision and Reflection
9	Oct 25-29	<i>N/A</i>	2 – 1 (lab, Section A) 2 – 2 (lab, Sections C/D)	<u>Section A:</u> Prelab 2 Team Contract Revision and Reflection <u>Sections C/D:</u> Mid-Unit Check-in 2
10	Nov 1-5	<i>N/A</i>	2 – 2 (lab, Section A) 2 – 3 (no lab, Sections C/D)	<u>Section A:</u> Mid-Unit Check-in 2 <u>Sections C/D:</u> Oral Presentation 2**
11	Nov 8-12	<i>N/A</i>	2 – 3 (no lab, Section A) 2 – 4 (no lab, Sections C/D)	<u>Section A:</u> Oral Presentation 2** <u>Sections C/D:</u> Lab Report 2 Peer feedback 2 (24 h later)
12	Nov 15-19	<i>N/A</i>	2 – 4 (no lab, Section A) 3 – 1 (lab, Sections C/D)	<u>Section A:</u> Lab Report 2 Peer feedback 2 (24 h later) <u>Sections C/D:</u> Prelab 3
13	Nov 22-26	<i>N/A (Thanksgiving Break Wed-Fri)</i>	3 – 1 (lab, Section A) No class (Sections C/D)	<u>Section A:</u> Prelab 3
14	Nov 29-Dec 3	<i>N/A</i>	3 – 2 (open lab time)	Mid-Unit Check-in 3
15	Dec 6-10	<i>N/A</i>	3 – 3 (no lab)	Oral Presentation 3**
Reading Days	Dec 13-15	<i>N/A</i>	<i>N/A</i>	Lab Report 3 (Memo format) Peer feedback 3 (24 h later)

**\*All deliverables are due by the start of your lab period, unless otherwise noted**

**\*\*Oral presentations will be held during your regular lab time in Brauer 3014.**

## Grading Structure:

<u>Individual Grade Contributions</u>		<u>Guaranteed Grade Cutoffs</u>	
• Prelab Assignment (3)	15%	93 ≤ A	73 ≤ C < 77
• Mid-Unit Check-in (3)	15%	90 ≤ A- < 93	70 ≤ C- < 73
• Final Lab Reports (3)	45%	87 ≤ B+ < 90	67 ≤ D+ < 70
• Oral Presentation	15%	83 ≤ B < 87	63 ≤ D < 67
• Peer/Team Evaluation (3)	5%	80 ≤ B- < 83	60 ≤ D- < 63
• Questions During Presentations	1%	77 ≤ C+ < 80	F < 60
• Process Safety Observations	2%		
• Canvas and Lecture Deliverables	2%		

The grade cutoffs represent the minimum score needed to achieve a specific grade letter. The instructors reserve the right to lower the cutoffs (i.e., make things easier), but they will not raise them. *Also, if at least 85% of the class completes the end-of-semester course evaluation, a 2% bonus will be awarded to everyone's grade.*

## Summary of Assignments:

### **Important note on all written assignments (Prelab, Mid-Unit, and Final Report/Memo):**

Group members will be responsible for different parts of these assignments according to team roles (described later in this document). **The Team Leader should turn in the assignment as a single PDF** to the relevant Canvas assignment page before the beginning of the lab period indicated on the course schedule. **No written assignment will be accepted late except under extenuating circumstances.**

*Grades will be assigned following the sample rubrics posted to Canvas. Note that writing style and formatting are a critical part of your grade for each of these assignments; you will be held to the standards outlined in the Laboratory Report Manual.*

### **Safety Form and Team Contract**

Signed safety forms and a completed initial Team Contract should be turned in on Canvas by lecture time in the 2<sup>nd</sup> week of class. **Failure to turn either of these in on time will result in a +/- grade penalty (e.g., A → A-).** Both documents are required to be able to participate in team lab activities.

After completing the first lab unit, you will also be asked to revise and reflect on your team contract based on what you learned while working together. This revision is due at the same time as the 2<sup>nd</sup> Prelab.

### **Prelab Assignment**

This assignment is intended to help you prepare for the laboratory experiments and to make progress on writing sections for the final report. The Prelab Assignment will consist of five parts:

1. Cover page (as described in Laboratory Report Manual)
2. Preliminary Introduction section
3. Preliminary Hazard and Operability (HAZOP) Analysis (choose 3 critical nodes to assess)
4. Preliminary Recommendations for appropriate safety precautions
5. Summary table outlining data analysis needs (*will not be part of final report*)
  - a. For each lab objective, list any equation(s) needed to calculate the item of interest and what experimental data you'll need to find to perform those calculations. Include literature citations for equations.
  - b. **Note:** Do not "dump" every related equation into this table – you should be presenting only those you will actually need to complete the analysis. This is your chance to think through the experiment and analysis process!

### Process Safety Observations

Each lab period, each team will be required to submit at least one process safety observation (either a violation of safety guidelines or a positive observation) to a survey link posted in the lab. Observations will be graded on completion. You should feel comfortable submitting a near-miss or other safety mistake, as that is the only way we can all improve! Process safety and lab safety are critically important, not only for your health and safety during this semester, but throughout your career. We hope that this assignment will help everyone become more aware of safety culture.

### Mid-Unit Check-In

The purpose of this assignment is to facilitate team progress towards the lab goals (particularly report writing) and to spur discussion between the team and the instructor. It will consist of the following parts:

1. Cover page (as described in Laboratory Report Manual)
2. Preliminary Data, Error, and Uncertainty analysis using any data collected so far
3. Preliminary Results section using any data collected so far
4. Preliminary Discussion section using any data collected so far
5. Preliminary Materials and Methods section (focusing on Apparatus and Procedures subsections)
  - a. *For the preliminary Procedures section, you are welcome to only draft those procedures you've used so far, or to draft the entire procedures section for all planned experiments.*
6. Experimental plan for the remaining lab periods (*will not be part of final report*)
  - a. This could be set up as a table organized by lab objective in which you outline what experiments you will be performing.
  - b. This section should concisely describe your entire experimental approach – e.g., What variables will you be measuring? What experimental conditions will you use for each measurement? How many replicates of each measurement? Etc.

### **Important note on the Prelab and Mid-Unit Assignments:**

*Although you are writing preliminary sections required for your final report, this task is largely an exercise to help you keep on track in terms of workload (because it's very easy to fall behind!) Grades will largely be based on effort and completion with some attention to quality. You will receive some simple feedback on sections included in the pre-lab and mid-unit assignments, but do not expect a level of feedback/detail in grading that you would receive on the final product. **It is vital that you understand that an absence of feedback is not an implication of correctness or of satisfying the grading criteria in the final report rubric.** If you have questions or want to discuss approaches to writing these sections, you are welcome to talk with us during office hours, post on Piazza, etc.*

### Final Lab Report/Memo

For the first two units, this deliverable will be in the form of a full technical report. For the final unit, this deliverable will be in the form of a short (3-page) memo. The goal here is to have you practice a different writing style tailored to a different audience. Full details (including suggested section word counts) are provided in the Laboratory Report Manual.

To help you learn the styling requirements for the Final Lab Report, you will have the opportunity to revise and re-submit your report for the **first unit only**. The final grade for this assignment will be the average of the original grade and the revised grade.

### Oral Presentation

During the noted lab session for each unit, the **Team Leader** for each group (**Note: NOT the entire group**) will give a 15-minute oral presentation on their group's work followed by a 5-minute question-and-answer period. The grade for the oral presentation will be an individual grade for the Team Leader. See the rubrics on Canvas for details on how the oral presentation will be assessed.

#### For 2-Person Teams ONLY:

Because each team member will have already presented (and because we realize that a 2-person team necessarily does more work per person for a given project), **the oral presentation for the third unit is optional** for 2-person teams. If the Team Leader chooses to give a presentation, their final presentation grade will be the average of this 3<sup>rd</sup> presentation and the presentation they did for a previous unit.

### Questions During Presentation Sessions

Each student will be required to ask at least one question of their peers during each oral presentation session. Asking questions is an important professional skill, not to mention it gives you an opportunity to not only understand the other unit operations more fully, but a chance to look ahead to later units.

### Peer Feedback/Team Evaluation Surveys

After each unit, you will be sent surveys from ITP Metrics (<https://www.itpmetrics.com/>), an online team assessment tool backed by research in team dynamics and feedback. These surveys will give each team member the opportunity to assess the performance of their team members and to provide constructive feedback to each other.

*Your grade will be based on completion of these surveys in a professionally constructive fashion. If your responses show a lack of thoughtfulness or a non-professional tone, you will **lose credit** for the survey. Additionally, if your team indicates that a specific member performed either well below or beyond expectations, that team member may be given a **5% penalty or boost to their course grade**.*

### Opportunity for Extra Credit: Process Safety Certificates

A knowledge and understanding of chemical process safety can often be critical to success (and unfortunately, sometimes longevity!) in your career. The American Institute of Chemical Engineers (AIChE) offers free process safety courses to students, which you can complete to earn a certification that you can list on your resume. Each course generally takes a few hours to complete, and will have an associated number of "Professional Development Hours" (PDH) earned.

For every 2 PDH earned by taking these safety courses this semester, you will earn 0.5% extra credit (maximum of 2% total). Simply email each course's completion certificate (a screenshot is fine) to both Dr. Brennan and Dr. Silbaugh.

The courses can be accessed at the link below. We recommend taking the Level 1 (Basic) courses first. If you've already completed these for another course or activity, please take some advanced courses instead. Note that you will need to be a member of AIChE to access the courses, but membership is free to students! There is a link at the bottom of this page to help you sign up.

<https://www.aiche.org/ccps/community/technological-communities/safety-and-chemical-engineering-education-sache/certificate-program>

## Team Member Roles:

For each unit operation unit, students will share the project responsibilities as members of a team. The responsibilities will be structured, split up, and graded according to roles **which will be rotated after each unit** (although you may choose who has which role first). For a three-person team, each team member should experience each role exactly one time. The basic responsibilities of each team member are shown in the following tables. **Details on the report/memo components (including a sample report/memo with tips) are given starting on pg. 12 of the Laboratory Report Manual.** For grading details, see the rubrics available on Canvas.

Teams should establish a cloud-based file sharing strategy, such as the use of Box or OneDrive for file storage and collaboration. Use of Zoom, Microsoft Teams, or a similar technology for meetings and team communications is encouraged.

**NOTE:** Although each team has assigned roles with designated responsibilities, that does **not** mean that the work cannot be delegated differently than what is listed here. In fact, you **should** delegate and share most of these responsibilities. The list below shows which team member is “ultimately” responsible for each component. It is up to you to work **as a team** to ensure that everything submitted is of high quality!

### **If Your Team is Having Issues with Teamwork / Interpersonal Conflicts...**

...you should know that we will not necessarily intervene actively unless you ask us to do so. We think of this course as an important opportunity to learn about how to work effectively as a team and deal with conflicts and realistic work environments (i.e., ones that are not always ideal). That being said, **we do care about you** and your success in this course!! If we can support you and help the situation by moderating a discussion or talking with specific group members, you have only to ask – this is something your manager at a “real job” would also do. Even if your teamwork experience in this course does not end up being what you wish it would be, we hope you can reflect on the experience and learn some lessons that will boost your success in the future.

### Roles For Three-Person Teams:

Role	Description	Responsibilities (can be delegated/shared)
Team Leader	<ul style="list-style-type: none"> <li>Facilitate discussions about and make final decisions on project direction/planning, coordination, and execution.</li> <li>Resolve team conflicts or differences.</li> <li>Act as primary point of contact and coordinate team communications.</li> <li>Schedule regular in-person team meetings for the purposes of planning, analysis, and reporting.</li> <li>Assign and set deadlines for team/individual activities and tasks.</li> <li>Submit all group assignments.</li> <li>Present Oral Presentation.</li> <li>Assist with data analysis, interpretation of data, and drawing of conclusions.</li> </ul>	Prelab Assignment: <ul style="list-style-type: none"> <li>Draft Introduction section</li> <li>Submission to Canvas</li> </ul> Mid-Unit Check-in: <ul style="list-style-type: none"> <li>Draft Discussion section for preliminary data</li> <li>Submission to Canvas</li> </ul> Final Report*: <ul style="list-style-type: none"> <li>Cover page</li> <li>Abstract</li> <li>Table of Contents</li> <li>Introduction</li> <li>Discussion</li> <li>Conclusion</li> <li>Overall story/coherence</li> <li>Final proofreading</li> <li>Submission to Canvas</li> </ul> Final Oral Presentation
Experimental Engineer	<ul style="list-style-type: none"> <li>Complete hazard analysis and develop plan for the safe handling of chemicals and safe operation of equipment.</li> <li>Conduct background research on all chemicals and equipment to be used.</li> <li>Establish a formal written procedure for data collection.</li> <li>Collect and manage data, and note experimental observations during lab.</li> <li>Assist with data analysis, interpretation of data and drawing of conclusions.</li> </ul>	Prelab Assignment: <ul style="list-style-type: none"> <li>Draft HAZOP Analysis (3 critical nodes)</li> <li>Draft Safety Recommendations</li> </ul> Mid-Unit Check-In: <ul style="list-style-type: none"> <li>Draft Apparatus section</li> <li>Draft Procedures section</li> <li>Experimental plan for remaining lab period(s)</li> </ul> Final Report*: <ul style="list-style-type: none"> <li>Apparatus (including PFD)</li> <li>Procedures</li> <li>HAZOP and Safety Considerations (appendix)</li> <li>Raw Data (appendix)</li> <li>Proofreading</li> </ul> Assists with content for Oral Presentation
Analyst	<ul style="list-style-type: none"> <li>Draw plots/charts and generate data tables.</li> <li>Double check calculations for correctness.</li> <li>Work with Experimental Engineer to design experimental procedure to include data acquisition replication where statistical analysis is required.</li> <li>Apply statistics and error analysis to data.</li> <li>Ensure adequate discussion of statistics and error analysis in reports</li> <li>Assist with data analysis, interpretation of data and drawing of conclusions.</li> </ul>	Prelab Assignment: <ul style="list-style-type: none"> <li>Data analysis plan to satisfy lab objectives</li> </ul> Mid-Unit Check-in: <ul style="list-style-type: none"> <li>Draft Data Analysis section</li> <li>Draft Error and Uncertainty Analysis section</li> <li>Draft Results section for preliminary data</li> </ul> Final Report*: <ul style="list-style-type: none"> <li>Data Analysis</li> <li>Error and Uncertainty analysis</li> <li>Results</li> <li>Sample Calculations (appendix)</li> <li>Proofreading</li> </ul> Assists with content for Oral Presentation

\*Requirements for Final Memo (3<sup>rd</sup> unit) are different! See rubrics posted to Canvas.

### Roles For Two-Person Teams:

Role	Description	Responsibilities (can be delegated/shared)
Team Leader/ Experimental Engineer	<ul style="list-style-type: none"> <li>Facilitate discussions about and make final decisions on project direction/planning, coordination, and execution.</li> <li>Resolve team conflicts or differences.</li> <li>Act as primary point of contact and coordinate team communications.</li> <li>Schedule regular in-person team meetings for the purposes of planning, analysis, and reporting.</li> <li>Assign and set deadlines for team/individual activities and tasks.</li> <li>Complete hazard analysis.</li> <li>Conduct background research on all chemicals and equipment to be used.</li> <li>Establish a formal written procedure for data collection</li> <li>Collect and manage data, and note experimental observations during lab.</li> <li>Ensure adequate discussion of statistics and error analysis in reports.</li> <li>Present Oral Presentation.</li> <li>Assist with data analysis, interpretation of data and drawing of conclusions.</li> <li>Submit all group assignments.</li> </ul>	Prelab Assignment: <ul style="list-style-type: none"> <li>Draft Introduction section</li> <li>Draft HAZOP Analysis (3 critical nodes)</li> <li><i>Submission to Canvas</i></li> </ul> Mid-Unit Check-in: <ul style="list-style-type: none"> <li>Draft Apparatus section</li> <li>Draft Procedures section</li> <li>Draft Discussion section for preliminary data</li> <li><i>Submission to Canvas</i></li> </ul> Final Report*: <ul style="list-style-type: none"> <li>Cover page</li> <li>Abstract</li> <li>Table of Contents</li> <li>Introduction</li> <li>Apparatus (including PFD)</li> <li>Procedures</li> <li>Discussion</li> <li>Conclusion</li> <li>HAZOP and Safety Considerations (appendix)</li> <li>Overall story/coherence</li> <li>Final proofreading</li> </ul> Final Oral Presentation
Analyst	<ul style="list-style-type: none"> <li>Develop plan for the safe handling of chemicals and safe operation of equipment.</li> <li>Draw plots/charts and generate data tables.</li> <li>Double check calculations for correctness.</li> <li>Work with Experimental Engineer to design experimental procedure to include data acquisition replication where statistical analysis is required.</li> <li>Apply statistics and error analysis to data.</li> <li>Assist with data analysis, interpretation of data and drawing of conclusions.</li> </ul>	Prelab Assignment: <ul style="list-style-type: none"> <li>Draft Safety Recommendations</li> <li>Data analysis plan to satisfy lab objectives</li> </ul> Mid-Unit Check-in: <ul style="list-style-type: none"> <li>Draft Data Analysis section</li> <li>Draft Error and Uncertainty Analysis section</li> <li>Draft Results section for preliminary data</li> <li>Experimental plan for remaining lab period(s)</li> </ul> Final Report*: <ul style="list-style-type: none"> <li>Data Analysis</li> <li>Error and Uncertainty Analysis</li> <li>Results</li> <li>Raw Data (appendix)</li> <li>Sample Calculations (appendix)</li> <li>Proofreading</li> </ul> Assists with content for Oral Presentation

*\*Requirements for Final Memo (3<sup>rd</sup> unit) are different! See rubrics posted to Canvas.*



## **Additional Course Policies:**

### **Absences**

Attendance in the lab sessions is not mandatory (strictly speaking). For example, if you are able to finish all of the project work in fewer sessions than are provided, then you do not need to attend the last session. If a team member must be late or absent to a particular lab session, it is up to the group to work around that. In other words, time management is up to you, so manage it wisely!

Note that except under extenuating circumstances, ***no extra lab time will be provided*** outside of the normal allotment. Attending lab and completing the project is your responsibility.

### **Safety Violations**

All students must adhere to the laboratory safety rules. It is up to the discretion of the AI and course instructors to not allow the group to work on a unit operation if that group violates safety rules, resulting in a zero for that lab report and oral presentation. Any “serious” violation of any of these safety rules may lead to immediate dismissal from the entire course.

### **Academic Integrity Policy**

As adults training to become accredited (and potentially practicing) engineers, you are expected to adhere to professional behavior with regards to planning your data collection, writing your lab reports, and giving your final presentations. This means that ***any work you submit or present should be the product of your team only***. **Any evidence of plagiarism or unauthorized collaboration will be dealt with harshly and will likely result in being reported to the Academic Integrity Officer in the School of Engineering.** These policies are in place not only to ensure that grades are assigned fairly, but to encourage personal growth and learning – copying from others is not a skill that will help you long-term!

For more information, please see the Washington University undergraduate academic integrity policy: <http://wustl.edu/policies/undergraduate-academic-integrity.html>

### **Diversity and Inclusion**

We consider our classroom and lab environments to be places where you will be treated with respect, and we welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class.

The Center for Diversity and Inclusion (CDI) supports and advocates for undergraduate, graduate, and professional school students from underrepresented and/or marginalized populations, collaborates with campus and community partners, and promotes dialogue and social change to cultivate and foster a supportive campus climate for students of all backgrounds, cultures and identities. See:

<https://diversityinclusion.wustl.edu/>

#### *Preferred Name and Gender Inclusive Pronouns:*

In order to affirm each person’s gender identity and lived experiences, it is important that we ask and check in with others about pronouns. This simple effort can make a profound difference in a person’s experience of safety, respect, and support. See: <https://students.wustl.edu/gender-pronouns-information/> , <https://registrar.wustl.edu/student-records/ssn-name-changes/preferred-name/>

### **Disability Resources**

Any accommodations for students with special needs must be documented with Disability Resources through Disability Resources. Please notify the instructors of any necessary accommodations (i.e., by sending your accommodations documentation) during the first week of class.

### **Confidential Resources for Instances of Sexual Assault, Sex Discrimination, Sexual Harassment, Dating Violence, or Stalking**

The University is committed to offering reasonable academic accommodations (e.g. a no-contact order, course changes) to students who are victims of relationship or sexual violence, regardless of whether they seek criminal or disciplinary action. If a student needs to explore options for medical care, protections, or reporting, or would like to receive individual counseling services, there are free, confidential support resources and professional counseling services available through the Relationship and Sexual Violence Prevention (RSVP) Center. If you need to request such accommodations, please contact RSVP to schedule an appointment with a confidential and licensed counselor. Although information shared with counselors is confidential, requests for accommodations will be coordinated with the appropriate University administrators and faculty. The RSVP Center is located in Seigle Hall, Suite 435, and can be reached at [resvpcenter@wustl.edu](mailto:resvpcenter@wustl.edu) or (314) 935-3445. For after-hours emergency response services, call (314) 935-6666 or (314) 935-5555 and ask to speak with an RSVP Counselor on call. See: [RSVP Center](#).

### **Reporting Sexual Harassment**

If a student comes to either Dr. Brennan or Dr. Silbaugh to discuss or disclose an instance of sexual assault, sex discrimination, sexual harassment, dating violence, domestic violence or stalking, or if we otherwise observe or become aware of such an allegation, we will keep the information as private as we can, but as a faculty member of Washington University, we are required to immediately report it to my Department Chair or Dean or directly to Ms. Cynthia Copeland, the University's Associate Title IX Coordinator, at (314) 935-3411, [cmcopeland@wustl.edu](mailto:cmcopeland@wustl.edu). Additionally, you can report incidents or complaints to the Office of Student Conduct and Community Standards or by contacting WUPD at [\(314\) 935-5555](tel:314-935-5555) or your local law enforcement agency. See: [Title IX](#)

### **Bias Reporting**

The University has a process through which students, faculty, staff and community members who have experienced or witnessed incidents of bias, prejudice or discrimination against a student can report their experiences to the University's Bias Report and Support System (BRSS) team. See: [brss.wustl.edu](http://brss.wustl.edu)

### **Mental Health**

Mental Health Services' professional staff members work with students to resolve personal and interpersonal difficulties, many of which can affect the academic experience. These include conflicts with or worry about friends or family, concerns about eating or drinking patterns, and feelings of anxiety and depression. See: <https://students.wustl.edu/mental-health-services/>

## Lab Groups and Unit Schedule

Teams will be assigned prior to the start of semester but are subject to change during the first week of class as dictated by lab section enrollment changes.

Lab Section (Lab time)	<b>Group 1</b> <i>Unit 1: Pump and Piping Unit 2: Gas Absorption Unit 3: Distillation</i>			<b>Group 2</b> <i>Unit 1: Gas Absorption Unit 2: Distillation Unit 3: Pump and Piping</i>			<b>Group 3</b> <i>Unit 1: Distillation Unit 2: Pump and Piping Unit 3: Gas Absorption</i>		
	<b>A</b> (Mon 1-5)	Ashley J.	Hayley S.	Patrick W.	Anish O.	Avi S.	Kyle S.	Sam M.	Andrew S.
<b>C</b> (Wed 1-5)	Michelle K.	Clinton S.	Kathryn T.	Chet D.	Jiayuan M.	Daniel R.	Jourdan H.	Gayle M.	Katy M.
<b>D</b> (Thurs 1-5)	Amanda G.	Jianing S.	Amanda Z.	Luke L.	Akiva S.		Colin P.	Connor R.	

Schedule example: Group C2 (section C, group 2) will work with Gas Absorption in weeks 3-7 of the course (1-1 through 1-5). Sessions 1-1 through 1-3 will be open lab sessions for the group to do their work. Session 1-4 will consist of an oral presentation, and the Final Report will be due at the start time of Session 1-5. In weeks 8-11 (2-1 through 2-4), Group C2 will work with Distillation. In weeks 12 through final exam week, Group C2 will work with Pump and Piping. For the second two units, the first 2 weeks will be open lab time, the 3<sup>rd</sup> week will be oral presentations, and in the final week, the final report or memo will be due.