

**Chemical Process Safety**  
ECH 4714, Class #20717, Section 6VJT  
**Class Periods:** Asynchronously online  
**Location:** Asynchronously online  
**Academic Term:** Summer 2024

**Instructor:**

Name: VJ Tocco

Email Address: [vjtocco@ufl.edu](mailto:vjtocco@ufl.edu) (preferred mode of contact)

Zoom Office Hours: Tuesdays and Thursdays 9:30 AM – 10:45 AM, or by appointment (link to be posted on Canvas)

Office: Black Hall 322

**Course Description**

3 credit hours. Laboratory and process safety analysis which emphasizes prevention and mitigation. Application of chemical engineering principles to assessing hazards and risk.

**Course Pre-Requisites / Co-Requisites**

Prerequisites: ECH 3101 (Process Thermodynamics), ECH 3203 (Fluid and Solid Operations) and ECH 3223 (Energy Transfer Operations)

**Course Objectives**

Upon completion of this course, a student should be able to:

1. Articulate the importance of Chemical Process Safety and a strong safety culture.
2. Locate information relevant to Chemical Process Safety.
3. Apply the correct theory/equations and perform calculations in the context of Chemical Process Safety.
4. Identify, analyze, and suggest mitigations for hazards associated with Chemical Processes.

**Materials and Supply Fees**

N/A

**Relation to Program Outcomes (ABET):**

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences	
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	High
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

### **Required Textbooks and Software**

- Title: Chemical Process Safety: Fundamentals with Applications
- Authors: Daniel A. Crowl and Joseph F. Louvar
- Prentice-Hall, Upper Saddle River, NJ, 2011, 4<sup>th</sup> edition (2019)
- ISBN-13: 9780134857848 (4<sup>th</sup> Ed)

The Chemical Reactivity Worksheet is software for identifying Chemical Compatibility (used in Module 7). Version 4 of this software is available for free through the AIChE website:

<https://www.aiche.org/ccps/resources/downloadinstall>

### **Recommended Materials**

ECH 4714 represents the synthesis of chemical engineering courses taken to date including *Material and Energy Balances*, *Transport Phenomena*, *Fluid and Solids Operations*, and *Thermodynamics*. Therefore, students are advised to refer to textbooks used in those classes and their previous notes as needed.

### **Course Schedule**

Module	End Date	Topic
1	5/23	Introduction to Chemical Process Safety
2	5/30	Toxicology & Industrial Hygiene
3	6/6	Source Models
4	6/13	Hazardous Material Dispersion
5	6/20	Fires & Explosions
6	7/11	Inerting & Other Fire/Explosion Prevention Methods
7	7/18	Chemical Reactivity
8	7/25	Reliefs and Sizing
9	8/1	Risk Analysis & Assessment
10	8/8	Holistic Process Safety

### **Attendance Policy, Class Expectations, and Make-Up Policy**

This course is offered online fully asynchronously, meaning that there are no regularly-scheduled required meetings.

**You are expected to complete all tasks proactively**, as specified in each module by the “end date” listed in the course schedule above.

**You are expected to complete all tasks within the framework for academic honesty**, defined **here**: all assignments are to be completed individually. However, as real-world Chemical Process Safety is highly collaborative, you are permitted to discuss material with classmates or generative AI applications. In your submitted work/responses, you must clearly notate which ideas are independently yours, and which ideas came about as a result of collaboration (attributing credit to the appropriate source).

**You are also expected to behave professionally** when interacting with the classroom community online.

Should circumstances arise that prevent or hinder you from doing so, you are expected to contact the instructor by email ([vjtocco@ufl.edu](mailto:vjtocco@ufl.edu)) as soon as possible. Because ECH4714 is asynchronous, no make-up assignments will be granted, except in cases of extreme extenuating circumstances that prevents you from working on Chemical Process Safety for longer than 3 days (again, contact VJ via email ASAP).

### **Evaluation of Grades**

Each module contains a list of things to **watch**, things to **read**, and things to **do**:

**To Watch:** Includes course content videos (produced by VJ) and Chemical Safety Board videos. A YouTube link will be provided for each separate video.

**To Read:** Sections of the textbook will be specified, along with the designation of “**required**” or “**optional**”. **Required** textbook readings are needed to perform tasks on the “to do” list, while **optional** readings are supplemental. This might also include Chemical Safety Board Reports, provided in PDF form.

**To Do:** There are 4 types of assignments in ECH4714 (each explained below):

**SChE Safety Certificates:** The Safety and Chemical Engineering Education (SChE) certificate program is sponsored by the American Institute of Chemical Engineers (AIChE). You’ll need to join AIChE (which is free for students) and login to access the content for free (repeat, for emphasis: do not pay to access SChE modules!). To receive credit, screen-shot your completion certificate and upload it to the proper Canvas assignment.

**Problem-Solving:** Traditional “homework sets”, similar to what you might find in other Chemical Engineering courses. To receive credit, scan your work (or, alternatively, work the problems electronically) and upload to the proper Canvas assignment.

**Discussion Posts:** Written responses to open-ended questions. Your responses will be visible to others, which will help us establish a sense of classroom community.

**Short Answer/Written Response/Timed Quiz:** Additional questions or writing topics about videos, reading, or other content will be administered in the form of a Canvas “Quiz”. Occasionally, these will be timed (and stated clearly before you start), to reflect the importance of memorizing/quick thinking in Chemical Process Safety.

Approximately one (sometimes zero, sometimes two) assignment of each type will be assigned for each module. **Material covered will be cumulative** (e.g. Module 3 content might appear in assignments for Module 7). Point values for individual assignments will vary, but will be posted for each module. Each module is worth 100 points, for a total of 1000 points in the course.

### ***Late Homework Submission***

Modules will close at 11:59 PM on the “end date” listed in the course schedule above. Provided that adequate documentation is presented **in advance of the deadline**, extensions will be handled on a case-by-case basis in a manner that is fair to you, fair to classmates, and consistent with University policy.

### ***Grading Policy***

<b>Minimum Percentage</b>	<b>Letter Grade</b>
94.0	A
90.0	A-
87.0	B+
84.0	B
80.0	B-
77.0	C+
74.0	C
70.0	C-
67.0	D+

64.0	D
60.0	D-

Please note: a score of C or better is required before continuing in the Chemical Engineering program. By University of Florida policy, a C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better).

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Students Requiring Accommodations***

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/studentsj>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/uflj>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-resultsj>.

### ***In-Class Recording***

**(VJ Comment: The language below is directly from UF Policy and required to be included in syllabi. As Summer 2024 ECH4714 is asynchronous, I will post all lectures/materials. Therefore, this policy should not apply)**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### ***University Honesty Policy***

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida

community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Commitment to a Safe and Inclusive Learning Environment***

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- HWCHE Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.ufl.edu)

### ***Software Use***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

### ***Campus Resources:***

#### ***Health and Wellness***

##### **U Matter, We Care:**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case

of emergency, call 9-1-1.

**Counseling and Wellness Center:** <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

**Sexual Discrimination, Harassment, Assault, or Violence**

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, [title-ix@ufl.edu](mailto:title-ix@ufl.edu)

**Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

| **E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>.

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling;  
<https://career.ufl.edu>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.  
<https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus:** <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code> /: <https://care.dso.ufl.edu>.

**On-Line Students Complaints:** <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>