

## ***Process Thermodynamics***

**ECH 3101**. Class number 12165

**Class Periods:** MWF, 7<sup>th</sup> period 1:55pm-2:45 pm

**Location:** MAT 0016

**Academic Term:** Spring 2023

### ***Instructor:***

Name R. Narayanan

**Email Address:** [RANGA@UFL.EDU](mailto:RANGA@UFL.EDU) You must put ECH 3101 on the subject heading of your email to get a response

Office Phone Number: 352 392 9103

Office Hours: In the Chem Eng. Building at 5:00pm on **Mondays and Wednesdays** (unless noted on CANVAS)- place to be determined and posted on CANVAS on the updated syllabus

### ***Supervised Teaching:***

Please contact through the Canvas website

- Jackson Powers, [powersj@ufl.edu](mailto:powersj@ufl.edu), office location TBD, office hours TBD

### ***Course Description 3 credits***

Introduces fundamental principles of classical thermodynamics. Applications to modeling and analysis of physical and chemical processes undergoing change.

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

COT 3502 and ECH 3264

### ***Course Objectives***

Upon completion the student should be able to:

1. Understand the fundamental basis of the first and second laws of thermodynamics
2. Estimate thermodynamic properties of pure gases and liquids using equations of state.
3. Develop mass and energy balance equations necessary to solve non-reactive steady-state and transient systems by hand.
4. Use tables, charts, or software to estimate physical property data needed to solve material and energy balances.
5. Work ethically with other students, both engaging in discussions and working independently.

### ***Materials and Supply Fees***

n/a

### ***Required Textbooks and Software***

- Chemical, Biochemical, and Engineering Thermodynamics
- Stanley I. Sandler
- Fifth edition (2017)
- **ISBN: 978-1-119-32128-6**

### ***Course Schedule. Weeks are Class Weeks***

Week 1: Chapter 1 and Chapter 2  
Week 2: Chapter 2 and Chapter 3, Quiz 1 (Jan 20)  
Week 3: Chapter 3 Quiz 2 (Jan 27)  
Week 4: Chapter 3 Quiz 3 (Feb 3)  
Week 5: Chapter 3 Quiz 4 (Feb 10)  
Week 6: Chapter 4. Quiz 5 (Feb 17)  
Week 7: Chapter 4. Quiz 6 (Feb 24)  
Week 8: Chapter 4. Quiz 7 (Mar 3)

***Process Thermodynamics, ECH 3101***

***R. Narayanan Sp 2023***

## Spring Break

Week 10: Chapter 4. Quiz 8 (Mar 24)  
Week 11: Chapter 5. Quiz 9 (Mar 31)  
Week 12: Chapter 5. Quiz 10. (Apr 7)  
Week 14: Chapter 6. Quiz 11 (Apr 14)  
Week 15: Chapter 6. Quiz 12 (Apr 21)

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

No attendance will be taken. No make up quizzes will be given under any circumstance. If you miss a quiz then its taken as a zero and remember that you can drop two of your worst quizzes. All quizzes are closed books/notes. Only calculators may be allowed (and you will be told in advance if you need one).

### **Evaluation of Grades**

<b>Work</b>	<b>Total Points</b>	<b>Total percentage</b>
Homework Sets (10) Selected answers will be posted. You must work all the HW	Will not be graded but quizzes will be entirely HW based	0
Quizzes (10 -12 quizzes) worst 2 will be dropped for each student	10 points per problem	100
		100

### **Grading Policy**

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
93-100	A	4.00
85-92.9	A-	3.67
76-84.9	B+	3.33
68-75.9	B	3.00
60-67.9	B-	2.67
51-59.9	C+	2.33
48-50.9	C	2.00
40-47.9	C-	1.67
27-39.9	D+	1.33
22-26.9	D	1.00
18-21.9	D-	0.67
<18.0	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/UGRD/Grades and Grading Policies>

### **Students Requiring Accommodations**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (352-392-8565,

<https://www.dso.ufl.edu/drc>). 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/students/>.

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/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

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

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.

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

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

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
- Jennifer Nappo, Director of Human Resources, 352-392-0904, [jpennacc@ufl.edu](mailto:jpennacc@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)

### ***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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

### ***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:

<http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

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

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

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

If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352 392-1575 so that a team member can reach out to the student.

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

##### **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 Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.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://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)

**On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.