MEMORANDUM FOR STUDENTS ENROLLED IN CHEN 3302 – Section 01

Lecture times: T/TH 3:30 pm -5:00 pm, RBN 1034

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Office hours: MW 11:30 – 1:00 pm

Welcome to CHEN 3302 - Chemical Engineering Thermodynamics II. This course provides coverage of advanced thermodynamic principles, including equations of state for real substances, equilibrium, multicomponent mixtures, and multiphase mixtures. Calculations will be related to practical examples in the chemical industry. The course has 7 learning objectives (see below) that can be broadly grouped into two categories: (a) acquiring the ability to apply equations of state, and (b) acquiring the ability to analyze the thermodynamics of mixtures.

Course Objectives:

1. Derivate the thermodynamic models of real pure compounds.
2. Perform calculations using equations of state for real substances.
3. Determine the equilibrium composition of single and multi-phase mixtures.
4. Explain the origin of chemical potential and fugacity.
5. Determine the fugacity of a pure component non-ideal gas and of pure liquids under high pressure.
6. Calculate a property of mixing for a system at equilibrium based on ideal gas or ideal solution
7. Calculate phase compositions for real mixtures at equilibrium based on equation of state for gas phases, and activity coefficient models for non-ideal liquid behavior

These course objectives will be used to evaluate the student learning outcome (SO1, SO2, SO7) for ABET:

ABET SO 1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
ABET SO 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
ABET SO 7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Meanwhile, these course objectives will be used to evaluate the "Critical thinking" abilities aligned with EOP (Engineering for one planet engineeringforoneplanet.org/wp-content/uploads/2025/08/EOP-Core-Learning-Outcomes.pdf)

Mode of delivery: This is a face-to-face course.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

The course has two prerequisites which must be completed with a minimum grade of "C" prior to taking this course:

- CHEN 3301, Chemical Engineering Thermodynamics I
- MATH 2415, Multivariable Calculus.

1. Q&A

Our goal is to be commonly available to you for assistance, so you are encouraged and expected to seek **additional instruction (AI)**. Take advantage of AI, it's FREE and really will help! There are several ways you can seek AI:

- ✓ You are welcome to stop by the instructor's office at any time. However, for your own satisfaction, you can ensure the instructor is available at the office by using the following options:
  - Come to Office hours (#). This is the time the instructor has set aside to answer your questions;
  - E-mail instructor to set up a mutually agreeable time to meet with the instructor,
- ✓ E-mail your questions to the instructor.

2. Class Room Procedures:

1. Bring study notes, **textbooks**, note-taking material, and calculator to every class. You may not borrow or exchange calculators during graded events. If your calculator fails during a graded exercise, I am not responsible to furnish a substitute. Class preparation is your individual responsibility.

2. Textbook:
   - Required:
     Fundamentals of Chemical Engineering Thermodynamics, Dahm and Visco ISBN-13 : 978-1111580704 (DV)

     Reference textbook:
     Chemical, Biochemical, and Engineering Thermodynamics 5th Edition, Stanley I. Sandler ISBN-13: 978-0470504796
     Engineering and Chemical Thermodynamics 2nd Edition, Milo D. Koretsky, ISBN-13: 978-0470259610
     Fundamentals of Chemical Engineering Thermodynamics, Themis Matsoukas, ISBN-13: 978-0132693066
     Introductory Chemical Engineering Thermodynamics, Carl T. Lira and J. Richard Elliot, ISBN-13: 978-0136068549

3. *Recitations:*
   Certain lectures will be used for recitation sessions. These will be the students' opportunity to practice problem-solving skills applying the concepts learned in lectures. These skills will be needed for solving homework, quizzes and exam problems. Please bring your textbook for the recitation sessions.

3. Evaluations:

1. *ACADEMIC DISHONESTY:* Representation of other's work as your own will not be tolerated. Cheating on examinations, quizzes, and homework and the false representation of work will be interpreted as academic dishonesty. Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline.

2. *Homeworks:* A set of homework problems will be assigned approximately every two weeks (there will be **Six homework** assignments during the semester). All homework is mandatory and becomes part of your grade. As an engineer, your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such, both the presentation and the accuracy of your work are important, and both will be graded. It is critical that you show all of your work and leave "foot prints" so that it can be easily followed. No guess work should be required to see what you did. For each homework problem, the corresponding topic and numerical answers will be provided. You are encouraged to work in groups, but the work that you turn in should be your own. **Homeworks are *due* at the 5 pm of the assigned date, and they must be submitted online via Canvas.**

3. *Open-ended project (presentation and report needed):* One group open-ended project will be assigned for the semester as a teamwork (2~3 people per group). The instructor will assign groups in the first two weeks, and the groups will need to submit the topic for the project at the end of Week 6 for approval from the instructor (One page ~200 words summary needed to be submitted for approval; you can send the draft anytime for instructor to review before the deadline of the summary). Open-ended projects are characterized by not having a unique, single answer/solution. Instead, they are creative exercises in which you are encouraged to apply the concepts learned in the course and search your own resources. They must be informative and then may be qualitative or quantitative. In either case, ensure your presentation and report are clear and detailed, as you will be evaluated based on the approach and thought process you use in these exercises. Students may use knowledge from Intro to Chemical Engineering, Thermodynamics I, and Thermodynamics II; at least one Thermodynamic concept should be central to the analysis (e.g., EOS selection/validation, fugacity/activity coefficients, γ–φ/φ–φ VLE, mixture/phase-equilibria, residual properties, flash calculations).

   i. A key aspect of this project is applying engineering design to produce solutions that meet specified needs, considering public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. This assignment will be used to assess ABET SO2 (Engineering Design) and ABET SO7 (Acquire and Apply New Knowledge), and it will satisfy the EOP Critical Thinking requirement mapped to ABET SO4 (Ethics and Professional Responsibility).

   ii. SO4 wording (explicit in this assignment): You must 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.

   iii. For this project, each group will explore and develop one engineering system design related to thermodynamics. You will analyze an existing system, identify its limitations, and propose a new or improved design. Your design must include a detailed thermodynamic analysis and demonstrate how the proposed improvements align with the specified needs and broader considerations.

   iv. A example structure of the project design:

   - Introduction:
     - Provide the necessary background on the system you have chosen to study.
     - Explain why this system is significant and what motivated your selection.
     - Include a brief overview of its current applications and importance in the context of public health, safety, and welfare, and global, cultural, social, environmental,

and economic factors; state any ethical and professional responsibilities and how you will make informed judgments about them (SO2/SO4).

- Analysis of Existing System
  - Discuss the current or previous implementations of the system.
  - Evaluate its performance, identifying key metrics such as efficiency, reliability, cost, safety, or environmental impact.
  - Highlight its drawbacks or areas where improvement is needed.
  - Identify key stakeholders, potential intended and unintended consequences, and risks to frame the problem comprehensively (EOP Critical Thinking → SO4).

- Expected Achievements
  - Clearly state the specific goals or improvements you aim to achieve with your new or modified design (performance targets, constraints, and evaluation criteria) (SO2).

- Proposed Design and Thermodynamic Analysis: How do you achieve the expectation by your design of the system, including the thermodynamic analysis and calculation of the process
  - Describe your proposed system design, detailing the modifications or innovations you are introducing.
  - Include a thermodynamic analysis of your proposed design, such as calculations for energy efficiency, heat/work, phase-equilibria/VLE, EOS choice and parameter justification, and other relevant metrics (identify at least one Thermo II method as central).
  - Compare the performance of your design with the existing system, using quantitative data to show potential improvements; discuss trade-offs, uncertainty, and limitations (SO2/SO4; EOP Critical Thinking).
  - New knowledge (SO7): document what you had to learn beyond lectures/textbook (e.g., property databases, vendor data, standards, contemporary literature/software) and explain how you validated and applied these sources (short "new-knowledge log" or appendix).
  - EOP Critical Thinking (maps to SO4): include a brief reflection (½–1 page) demonstrating comprehensive problem framing, how you recognized ethical and professional responsibilities, how you made informed judgments, and how you considered impacts in global, economic, environmental, and societal contexts when selecting your final design.

v. Example Topic: Refrigerant Selection and Cycle Design for a Small Heat Pump

- Introduction & Problem Definition (SO2, SO4/EOP-CT)
    - Provide background on residential heat pumps (heating & cooling), why high-efficiency refrigerants matter, and who is affected (homeowners, technicians, community). State the design need (e.g., "deliver ~3.5 kW heating at 5 °C ambient"). Include one paragraph that recognizes ethical and professional responsibilities in engineering situations and makes informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (SO4).

- Candidate Options & Constraints (SO2)
    - List three refrigerant options (e.g., R-1234yf, R-290 [propane], R-744 [CO_2], R-32, or a blend). Summarize basic properties, typical operating pressures, safety class (flammability/toxicity), environmental factors, availability, and regulatory considerations. Identify design constraints: target capacity, temperature lifts, compressor limits, safety codes, and cost envelope.

- Thermodynamic Cycle Model (Baseline) (Thermo I → SO2; Thermo II central)
    - Build a simple vapor-compression cycle (evaporator, compressor, condenser, expansion device). Define state points and compute COP and heating/cooling capacity using an isentropic compressor model (with assumed efficiency) and heat balances across heat exchangers. This section can also use at least one Thermo II method (pick one):

    - EOS selection/validation (PR or SRK) to compute h, s, v across states; or saturation/flash calculations for key state points; or γ–φ / φ–φ modeling for a blend (stretch option).

- Property Models & Data Justification (Thermo II central → SO7)
    - Explain and justify your property method(s): which EOS (and why), any correlations used (e.g., for cp(T)), and how saturation properties were obtained. If considering a blend, outline your approach to VLE (γ–φ or φ–φ) and any parameter sources. Include a short "new-knowledge log" listing data sources (handbooks, vendor sheets, standards, papers/software) and how you validated them (SO7).

- Performance & Energy Analysis (SO2)
    - For each candidate refrigerant, calculate COP at the design condition; estimate compressor power and condenser/evaporator duties. Report expected operating pressures and approximate mass flow rate (from capacity and enthalpy difference).

- Trade-offs, Risk, and Decision (SO2, SO4/EOP-CT)
    - Create a matrix comparing at least three options on performance (COP/capacity), safety (flammability/toxicity, operating pressure), environment (energy efficiency, leakage impacts), cost/availability, and

uncertainty. Make and defend a final design recommendation with an informed judgment that weighs global/economic/environmental/societal impacts (SO4/EOP-CT).

- Reflection (SO7)
  - Identify what you had to learn beyond class (SO7) and how it changed your design choices.

4. Late Submissions. It is a basic principle of professionalism that "Professionals are not Late." A "COORDINATED LATE" submission occurs when you will miss the due date for a graded assignment and you contact me in advance. Notification immediately before the submission will not suffice. Point cuts up to the amounts below may be assessed for a "COORDINATED LATE" submission:

1. 0-24 hours late	a deduction of 25% of the earned grade
2. 24-48 hours late	a deduction of 50% of the earned grade
3. More than 48 hours late	No credit.

Obviously, there are circumstances that will occur and make a timely submission impossible and I will work with you when and if they occur.

5. Participation, conduct, and professionalism: You should conduct yourself in a professional manner in the class. Attendance in class is the component with more weight on participation. A student who attends classes (except for unavoidable circumstances) and is professional, will receive full credit. **One time absence without advance notice of unavoidable circumstances, 1 ptof participation credit will be removed**

6. *Quizzes:* Quizzes will be administered throughout the semester without prior notice. **They will take place at the beginning of a new topic. The quizzes will only cover concepts or questions of examples/homework (value may be modified) from previously covered topics.** *(6 topics included in this semester indicate at least 5 quizzes will be processed)*

7. Mid-Term Exams and Final Exam: **There will be one Midterm Exam and one Final exam processed in classroom**. The Midterm will be ninety minutes long, and the Final will be two hour long. The dates for Exams are included in the course schedule. Official reasons for missing an exam are outlined in the "Student Handbook". You are required to take a make-up Exam, regardless of your reason for missing the scheduled Exam. Report any conflict to me as soon as possible prior to the Exam. You can use a **TI-30 calculator** (or FE equivalent). Additionally, a double-sided note sheet, handwritten or printed, may be allowed in the exams, provided it is no larger than ***letter size.***

8. The HWs, quiz and exams will be graded based on the rubric:(**The final rubric will be updated in the Canvas, please see the updated Rubric in canvas, here is just for your reference**):

Rubric Outcome 1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics					
Performance Indicators	**1 Unsatisfactory**	**2 Below Satisfactory**	**3 Satisfactory**	**4 Commendable**	**5 Superior**
Identify Problem	Shows no understanding in identifying the problem	Shows little understanding in identifying the problem	Shows adequate understanding of the major facets of the problem	Shows understanding of most facets of the problem	Shows understanding of most or all facets of the engineering problem
Formulate Problem	Cannot create a mathematical model to solve the engineering problem	Creates a mathematical model, but it has serious errors or is missing major components or is inappropriately constructed	Mathematical model is mostly correct, but some details are missing or inappropriately included	Mathematical model is basically correct and reasonably complete, but some minor details are missing or inappropriately included	Mathematical model was correctly created and shows a complete understanding of the engineering problem
Solve Problem	No apparent sequence to solving the problem or significant steps missing	Several steps in the solution technique are present but it is incomplete, or the order is incorrect	Some solution steps are present, and the solution sequence is almost correct with some errors	Most solution steps are present, and the solution sequence is generally correct with minor errors	All solution steps are present, and the solution sequence is readily apparent and correct
Complexity - involving many components parts or subproblems	No complex solution attempted or shows no understanding of necessary components parts or subproblems	Shows little understanding of complex solution, misses major points and makes significant errors – some components, parts or sub-problems	Shows adequate Shows adequate understanding of complex problem and is correct except for some errors all major components parts or subproblems	Shows understanding of Shows understanding of complex problem and is correct except for small errors all major components parts or subproblems	Shows understanding of complex problem Creates a complex solution – all major components parts or subproblems

4. Grading:

1. Grades will be based entirely on the student's demonstrated ability to develop detailed, neat, organized, and correct solutions to the problems presented. Correct answers accompanied by incorrect, incomplete, or untidy solutions may receive no credit. Incorrect answers with clear step, partial correct explanation, steps and solutions will be considered for partial credit. Answer is important, but how to get the correct answer is also significant.
2. The presentation of open ended reports are group work and each member must present partial of it.
3. The report of Open-ended experimental design are required to include the contribution of each member
4. The course points will be assigned as shown below:

Course Points	
Open-end project (Presentation +report)	(9+9=18%)
Homework	(18%)
Quizzes	(20%)
Mid-term	(18%)
Final exam	(18%)
Participation, conduct and professionalism	(8%)
	Total 100 (100%)

Grade Scale based on points	
A	88~100
B	73~87
C	60~72
F	<60

5. Collection of Student Work:

Throughout the semester I will collect and retain all course artifacts (exams, quizzes, homework, labs, and project materials) for ABET and EOP assessment. For this reason, originals are not routinely returned. You may

review graded work in class or during office hours; after review, materials must be returned the same day. If you need a personal copy, you may photograph/scan your work during the review period or request an electronic copy. Upon student request, an original may be returned once I have created and retained a complete copy for the ABET/EOP archive. These materials are used only for accreditation; identities are kept confidential, and I will not draw attention to any student's performance level when selecting samples.

6. Use of Generative AI in This Course

Generative AI tools (such as ChatGPT or Copilot) are permitted only for specific assignments or open-ended project, and appropriate acknowledgment is required. This course includes open-ended assignments where the use of generative artificial intelligence (AI) tools is permitted. When AI use is allowed, it will be clearly stated in the assignment directions, and all uses of generative AI must be properly acknowledged and cited.

Copying and pasting from AI-generated content or using AI to generate entire reports, presentations, or slides is strictly prohibited. Generative AI tools are to be used only as a supplementary resource to help you quickly understand new concepts that may be involved in your open-ended topics. It is important to cross-check AI-generated information with other reliable sources, as AI can sometimes produce incorrect or misleading information.

In all other cases, including homework, quizzes, and exams, the use of generative AI is not allowed at any stage of the assignment.

7. Assigned readings:

The class schedule will include assigned reading for every lecture. Students who read the corresponding sections of the book *before each class* will certainly make the most of the lectures, so this is highly recommended. In addition, the instructor will periodically post the lecture notes on the course website. Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (***I will not cover everything***). It will also make you more familiar with terms and concepts to be covered.

8. **UT Tyler Honor Code** - Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

9. **Students Rights and Responsibilities:** to know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php.

10. **Campus Carry** - We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php.

11. **UT Tyler a Tobacco-Free University** - All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation

programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

12. **Grade Replacement/Forgiveness and Census Date Policies** - Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:
    - Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
    - Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
    - Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
    - Being reinstated or re-enrolled in classes after being dropped for non-payment
    - Completing the process for tuition exemptions or waivers through Financial Aid

13. **State-Mandated Course Drop Policy** - Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

14. **Disability/Accessibility Services** - In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.

15. **Student Absence due to Religious Observance** - Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

16. **Student Absence for University-Sponsored Events and Activities** - Revised 05/19 If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

17. **Social Security and FERPA Statement** - It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

18. **Emergency Exits and Evacuation** - Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

19. **Student Standards of Academic Conduct** - Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

20. UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

Schedule:

week	Date			Material	Reading	Evaluation due (5:00 pm)
1	Aug	26	T	Syllabus, Review	Chpt 1-5	
1	Aug	28	Th	Review	Chpt 6	
2	Sep	2	T	Heat Capacity and Residual Properties	Chpt 6.3	First drop for non-payment
2	Sep	4	Th			OEP topic
3	Sep	9	T	EOS	Chpt 7.1 7.2	
3	Sep	11	Th	Cubic EOS	Chpt 7.2 7.3	
4	Sep	16	T	Beyond the Cubic EOS	Chpt 7.4	HW 1 Chpt 6
4	Sep	18	Th			
5	Sep	23	T	- Modeling Phase Equilibrium for Pure Components	Chpt 8.1 8.2	
5	Sep	25	Th	Mathematical Models of Phase Equilibrium	Chpt 8.2	
6	Sep	30	T	Fugacity and Its Use in Modeling	Chpt 8.3	HW 2 Chpt 7
6	Oct	2	Th	Fugacity and Its Use in Modeling	Chpt 8.3	OEP 1-page summary
7	Oct	7	T	An introduction to Mixtures & ideal solutions	Chpt 9.1 9.2	
7	Oct	9	Th	Property of mixture	Chpt 9.2 9.3	HW 3 Chpt 8
8	Oct	14	T	Mathematical Framework for Solutions	Chpt 9.3 9.4	
8	Oct	16	Th			
9	Oct	21	T	**Midterm 1**	Chpt 6~8	
9	Oct	23	Th	VLE & Raoult's Law	Chpt 10.1 10.2	
10	Oct	28	T	Raoult's Law and Data	Chpt 10.2	HW 4 Chpt 9
10	Oct	30	Th	Mixture, Critical Point and Lever Rule	Chpt 10.2 10.3, 10.4	
11	Nov	4	T			
11	Nov	6	Th	Theories and Models for VLE Mixtures	Chpt 11.1 11.2	
12	Nov	11	T	Fugacity in Mixtures	Chpt 11.3 11.4	
12	Nov	13	Th	Gamma-Phi Modeling, Modified Raoult's Law	Chpt 11.4 ,11.5	HW 5 Chpt 10
13	Nov	18	T	Excess Molar Gibbs Free Energy Models	Chpt 11.6 11.7	

13	Nov	20	Th	Excess Molar Gibbs Free Energy Models & Consistency	Chpt 11.8 11.9	
14	Nov	25	T	No Class — Thanksgiving Break		
14	Nov	27	Th	No Class — Thanksgiving Break		
15	Dec	2	T	chemical rxn and equilibrium		HW 6 Chpt 11
15	Dec	4	Th	Open ended discussion		
16	Dec	9	T	Final project presentation		OEP report
16	Dec	11	Th	Final Exam Chpt 9 ~ 11		

Tentative Dates for Assessments and Deliverables: There will always be more than one week to complete homework after it is assigned. Assignments due for the week will be announced in canvas, please make sure to check canvas for announcements regularly.

Open-end project presentation and report due dates will not be changed.

Mid-term: tentative date may be changed based on progress

Final Exam: TBA University Schedule

Note: This is a tentative syllabus. As the instructor, I reserve the right to modify this syllabus as needed throughout the semester.