

Fall 2016 Academic Calendar

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September	5	Monday	Labor Day
September	6	Tuesday	First Day of Classes
September	10	Saturday	Saturday Classes Begin
September	12	Monday	Last Day to Add/Drop a Class
September	12	Monday	Last Day for 100% Refund, Full or Partial
September	13	Tuesday	W Grades Posted for Course Withdrawals
September	19	Monday	Last Day for 90% Refund, Full or Partial Withdrawal - no refund for partial withdrawal after this date
October	3	Monday	Last Day for 50% Refund, Full Withdrawal
October	24	Monday	Last day for 25% Refund, Full Withdrawal
November	7	Monday	Last Day to Withdraw
November	22	Tuesday	Thursday Classes Meet
November	23	Wednesday	Friday Classes Meet
November	24	Thursday	Thanksgiving Recess Begins
November	27	Sunday	Thanksgiving Recess Ends
December	14	Wednesday	Last Day of Classes
December	15	Thursday	Reading Day
December	16	Friday	Final Exams Begin
December	22	Thursday	Final Exams End

**ChE 230-003 Chemical Engineering Thermodynamics I
Fall 2016**

type	Time	Days	Where	Date Range	Instructors
Class	2:30 pm - 3:55 pm	MR	Faculty Memorial Hall 408	Sep 06, 2016 - Dec 14, 2016	Xianqin Wang (P)

Dr. Xianqin Wang

Tiernan 360 (office)

596-5707 (phone)

xianqin.wang@njit.edu (e-mail)

Office Hours

Thursday 10:00AM - 12:00 PM

(note: you can always make appointment with me by email if the office hour time conflicts with your classes)

CHE 230W - CHE THERMODYNAMICS I WORKSHOP										
Section #	Call #	Days / Times			Room	Status	Max	Now	Instructor	Credits
001	90962 View Book Info	T 0830AM - 0925AM			TIERLECT 1	Open	45	33		0.00
003	90963 View Book Info	R 0830AM - 0925AM			FMIH408	Open	45	41		0.00

ChE-230W instructor:

Tsou, Yung-hao email: yt99@njit.edu

General:

The three introductory courses in the sophomore year, ChE 210, ChE230 and ChE240, and ChE 342 are the basic courses in chemical engineering fundamental principles. What you learn in these three courses will appear over and over again throughout your junior and senior courses. Therefore, it is in your best interest to learn these subjects well now. Please plan to spend a **minimum** of 10-15 hours per week on your homework problems for this course. Failure to meet this goal will seriously jeopardize your successful completion of this course and will harm your efforts in the junior and senior year.

Prerequisites: Chem 126, (or Chem 123), Math 112, Phys 111, (or Phys 106). Corequisite Math 211 (or Math 213). The Fundamentals of thermodynamics are applied to chemical engineering processes. Thermophysical properties and their engineering correlations are covered. Applications include chemical engineering and related fields such as environmental and biomedical engineering.

Textbooks "Introduction to Chemical Engineering Thermodynamics", 7th ed., Smith, Van Ness and Abbott, McGraw-Hill, 2007. (undergraduate textbook)

Course objectives:

1. Prepare students with the ability to accurately calculate values of thermophysical properties of pure substances
2. Prepare students with the ability to perform thermodynamics analyses of chemical engineering processes
3. Encourage students to understand the course materials in a broader perspective

Topics will be covered:

1. Review of the first law and basic concepts
2. PVT diagrams
3. Virial equation, cubic equation of state, generalized correlations
4. PVT equations application in safety and health issue and design
5. Heat effect, sensible heat/latent heat, temperature dependence of heat capacity, several types of heat of reactions, basic concepts
6. 2nd Law statements, heat engine, Carnot cycle, Carnot theorem and proof, ideal work, lost work, 3rd Law
7. Property relations of homogeneous phase, residual properties, residual properties by equation of states, two phase systems, thermodynamic diagrams, tables of thermodynamic properties, generalized properties of gases and gas mixtures
8. Examinations

Grading The final grade on a 1000 point basis as follows:

Homework (team work)	100 pts	(10%)
Quizzes (individual)	100 pts	(10%)
In Class Activity (team work)	100 pts	(10%)
Exam 1 (individual)	150 "	(15%)
Exam 2 (individual)	150 "	(15%)
Exam 3 (individual)	150 "	(15%)
Final exam (individual)	250 "	(25%)

Letter grades will be awarded for the following totals:

A	850 and above
B+	800-849 "
B	750-799 "
C+	700-749 "
C	650-699 "
D	550-649 "
F	less than 550 "

Before the final exam, those students, who can get above 95% (712.5points) from all homework, all quizzes, all in-class activity, exam 1 , 2, 3, can be exempted from final exam.

Homework policy: Homework assignments will be collected and graded. Homework assignments are the responsibility of the students. You are strongly advised to work on the homework problems because you will NOT learn this material unless you get into the materials **“Hands-on”**.

Quizzes There will be quizzes occasionally at the beginning of the class. If you miss the class, you will miss the quiz that day. There will be no makeup quiz! Close book and close notes!

In-class group activities policy: Dates of group activities are not announced in advance. Students not being present in class when a group activity (which is to be graded) **starts**, get no credit (zero) for that activity. Each student will be asked at the end of the semester to confidentially rate his/her performance/effort as well as that of all his/her group-mates. This rating will reflect the performance when the members were actually present. Attached is the evaluation form. The completed evaluation form has to be submitted either as a hard copy in a sealed envelope or as a word-file attached to an e-mail to the instructor. **Evaluation forms are due on Dec 14th 2016. Submission of the form after Dec. 14th 2016 and before the final exam will result to the late submitter getting 75% of the credit that he/she would had received if the form was submitted timely. Submission of the form at the final exam will lead to a further 25% reduction of the credit. No student will be allowed to take the final exam without prior submission of the self & peer evaluation form.**

Exam policy: There will be three semester examinations [1 hour and 25 minutes each] and a comprehensive final exam. All exams are open **textbook/ instructor lecture** notes. Graded homework problems **cannot** be used during exams. Additional personal notes on the course (or solutions to additional problems), copies of class notes, as well as copies of the instructor's solutions to homework problems are also **not allowed** to be used during exams. Graded exams will be returned a week after they are taken.

Policy on exams (other than final): A student must have a compelling reason to miss an exam. Documentation of the reason (e.g., doctor's note) is needed for the instructor to consider giving a make-up exam. A student who cannot make it to an exam needs to either e-mail or call and leave a voice message for the instructor **before** the exam is held. **A student missing (for any reason) the first two exams has to withdraw from the course. A single (comprehensive) make-up exam will be given on the reading day (Dec. 15th 2016) for those who have missed an exam for documented/ legitimate reasons.**

Policy on final exam: The final exam will be based on the entire course material. Students missing the final exam without a documented serious excuse fail the course. Students missing the final exam with a documented serious reason get an Incomplete. The Incomplete will be removed after students take the final exam in Spring 2017 (grade to count towards 25% of the composite). If the course is not offered in Spring 2017, a special make-up final will be scheduled during the Spring 2017 finals week.

Disputing a grade on tests/assignments: If a student has questions about the grade he/she has received on an exam, homework, or group activity he/she must talk to the instructor (or the teaching assistant where appropriate) **no later than a week after the graded activity has been returned to students. No grade change will be made after the one week period.**

Classroom policies: Eating, drinking and the use of telecommunication devices (for any reason, including texting and use as a calculator) are not allowed during class.

ChE 230 Prerequisites: Chem 126, (or Chem 122), Math 112, Phys 111. Corequisite Math 211 (or Math 213). The Fundamentals of thermodynamics are applied to chemical engineering processes. Thermophysical properties and their engineering correlations are covered. Applications include chemical engineering and related fields such as environmental and biomedical engineering. **Effective From: Fall 2008**

Chem 126 - General Chemistry II (3-0-3)

Prerequisite: Chem 125 or equivalent. The second semester of a two-semester sequence in chemistry. Introduces the basic concepts of chemistry, including equilibrium, chemical kinetics, thermodynamics, and electrochemistry. Students should also register for Chem 124.

Chem 123 - Fundamentals of Chemistry III (3-0-3)

Prerequisite: Chem 122. Continuation of the Chem 121 sequence. Introduces the student to the basic concepts of chemistry, including equilibrium in solution, kinetics and thermo-dynamics. Students should also register for Chem 124.

Phys 111 - Physics I (3-0-3)

Corequisite: Math 111. Elementary mechanics with an emphasis on the fundamental concepts and laws of mechanics, especially the conservation laws. Topics are scalar and vector quantities of mechanics; rectilinear and circular motion; equilibrium and Newton's laws of motion; work, energy, momentum; the conservation laws. Lab must be taken concurrently. See Phys 111A.

Math 112 - Calculus II (4-1-4)

Prerequisite: Math 111 with a grade of C or better. Topics include integration, applications of integration, series, exponential and logarithmic functions, transcendental functions, polar coordinates, and conic sections.

Math 211 - Calculus III A (3-0-3)

Prerequisite: Math 112 with a grade of C or better. Topics include vectors, curvature, partial derivatives, multiple integrals, line integrals, and Green's theorem. Students who are considering a major in Mathematical Sciences or who are undecided about their major should take Math 213.

Math 213 - Calculus III B (4-0-4)

Prerequisite: Math 112 with a grade of C or better. Topics include vectors, curvature, partial derivatives, multiple integrals, line integrals, and Green's, divergence, and Stokes' theorems

WEEK	DATES	Tentative Contents	HOMEWORK PROBLEMS
1	9/5/2016		Assignment 1: Chap 1: 5,8,16, 18,22, 25
	9/8/2016	Chapter 1	
2	9/12/2016	Chapter 1	Assignment 1 due
	9/15/2016	Chapter 2	
3	9/19/2016	Chapter 2	Assignment 2: Chap 2: 1,5,18,23, 26, 30,36
	9/22/2016	Chapter 2	
4	9/26/2016	Chapter 2	Assignment 2 due
	9/29/2016	Exam 1, Chapter 1-2	
5	10/3/2016	Chapter 3	
	10/6/2016	Chapter 3	
6	10/10/2016	Chapter 3	Assignment 3: Chap 3: 6,9,18,22,24,35,38b,45,49,55,65a,73
	10/13/2016	Chapter 3	
7	10/17/2016	Chapter 3	Assignment 3 is due.
	10/20/2016	Chapter 4	
8	10/24/2016	Chapter 4	Assignment 4 Chap 4: 1b,3,7,9a,10b,11a, 20, 21c, 45e
	10/27/2016	Exam 2, Chapter 3-4	
9	10/31/2016	Chapter 5	Assignment 4 is due
	11/3/2016	Chapter 5	
10	11/7/2016	Chapter 5	Assignment 5 Chap 5: 3,9,10,18e,26,27b,30,34,38,39b,47b 11/7/2015: Withdrawal deadline
	11/10/2016	Chapter 5	
11	11/14/2016	Chapter 5	
	11/17/2016	Chapter 5	
12	11/21/2016	Chapter 6	Assignment 5 is due
	11/22/2016	Thursday Classes Meet Chapter 6	
13	11/28/2016	Chapter 6	Assignment 6 Chap 6: 7,9,10,14c, 22,24,28,32,37,39,41,47,64,65,80
	12/1/2016	Chapter 6	
14	12/5/2016	Chapter 6	
	12/8/2016	Exam 3, Chapter 5-6	
15	12/12/2016	Review day	Assignment 6 is due
	12/15/2016	Make-up exam day	
16	TBD	Final exam	