

# Spring 2017 Academic Calendar

January	16	Monday	Martin Luther King, Jr. Day
January	17	Tuesday	First Day of Classes
January	21	Saturday	Saturday Classes Begin
January	23	Monday	Last Day to Add/Drop Classes
January	23	Monday	Last Day for 100% Refund, Full or Partial Withdrawal
January	24	Tuesday	W Grades Posted for Course Withdrawals
January	30	Monday	Last Day for 90% Refund of Tuition (no refund for fees), Full or Partial Withdrawal - no refund for partial withdrawal after this date
February	13	Monday	Last Day for 50% Refund of Tuition (no refund for fees), Full Withdrawal
March	6	Monday	Last day for 25% Refund of Tuition (no refund for fees), Full Withdrawal
March	12	Sunday	Spring Recess Begins - No Classes Scheduled - University Open
March	19	Sunday	Spring Recess Ends
March	27	Monday	Last day to Withdraw
April	14	Friday	Good Friday - No Classes Scheduled - University Closed
May	2	Tuesday	Friday Classes Meet
May	2	Tuesday	Last Day of Classes
May	3	Wednesday	Reading Day
May	4	Thursday	Reading Day
May	5	Friday	Final Exams Begin
May	11	Thursday	Final Exams End
May	16	Tuesday	Final Grades Due
May	16	Tuesday	Commencement (tentative)

## 1. ChE 370 Heat and Mass Transfer Spring 2017

Class	12:15 pm - 2:25 pm	T	Faculty Memorial Hall 405	Jan 17, 2017 - May 02, 2017
Class	1:00 pm - 3:10 pm	F	Faculty Memorial Hall 313	Jan 17, 2017 - May 02, 2017

2. **Credits and contact hours**  
(4-0-4) (Lecture hr/wk-lab hr/wk-course credits)

3. **Course coordinator/instructor**

Dr. Xianqin Wang  
Tiernan 360 (office)  
596-5707 (phone)  
[xianqin@njit.edu](mailto:xianqin@njit.edu) (e-mail)

### Office Hours

Friday 10:30AM - 12:00 PM

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

4. **Specific course information**

#### General:

CHE 370 - HEAT AND MASS TRANSFER (4 credits). The principles of heat and mass transfer in chemical engineering systems are covered. Steady and unsteady heat transfer is examined, with emphasis on the heat exchanger design. Mass transfer by steady and unsteady molecular diffusion, and turbulent convective mass transfer is studied.

Pre-requisites: ChE 240, ChE 260, Math 222.

Textbooks Textbooks: Required - Heat and Mass Transfer: Fundamentals and Applications– April 4, 2014 by Yunus Cengel and Afshin Ghajar. ISBN-13: 978-0073398181, ISBN-10: 0073398187 Edition: 5th.

Recommended –1) Transport Phenomena Fundamentals, Third Edition by Joel L. Plawsky. ISBN-13: 978-1466555334 ISBN-10: 1466555335 2) Transport Phenomena, Revised 2nd Edition by R. Byron Bird, Warren E. Stewart, Edwin N. Lightfoot. ISBN-13: 978-0470115398 ISBN-10: 0470115394

Required Software: Latest versions of Matlab, MS Office, Adobe Reader (all can be downloaded from NJIT IST webpage). Student Mall labs and ChE department PC lab have most of the software. Please see Highlander Pipeline for Matlab tutorial and example programs.

5. **Specific course objectives**

1. To develop the students' skills in applying differential equations for describing steady and transient heat and mass transfer problems
2. To develop the students' skills in applying engineering design approaches for heat and mass transfer components and systems
3. To develop the students' skills in modeling and dimensionless analysis for heat and mass transfer problems in different geometries
4. To provide the students with fundamental theoretical concepts and practical analysis skills associated with convective heat and mass transfer including external and internal flow configurations
5. To provide the students with fundamental theoretical concepts and practical analysis skills associated with radiation heat transfer
6. To develop students' skills in solving practical heat transfer problems using thermal resistance networks
7. To develop students' skills in working with contemporary heat and mass transfer related research literature and develop their own, application driven engineering solutions working as a team.

## 6. Grading

The final grade on a 1000 point basis as follows:

Homework (team work)	100 pts	(10%)
Quizzes (individual)	100 pts	(10%)
Group project (team work)	200 pts	(20%)
Mid-Exam (individual)	300 "	(30%)
Final exam (individual)	300 "	(30%)

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 "

## 7. Policies on assignments/exams and classroom policy

**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 May 2<sup>nd</sup> 2017. Submission of the form after May 2<sup>nd</sup> 2017 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 one mid-term [2 hours each] and one 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 (May 3<sup>rd</sup> or 4<sup>th</sup> 2017) 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 Fall 2017 (grade to count towards 25% of the composite). If the course is not offered in Fall 2016, a special make-up final will be scheduled during the Fall 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.

**8. Course outcomes (Highlighted in yellow) (a-k ABET)**

- a) an ability to apply knowledge of mathematics, science and engineering
- b) an ability to design and conduct experiments, as well as to analyze and interpret data
- c) an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) an ability to function on multi-disciplinary teams
- e) an ability to identify, formulate, and solve engineering problems
- f) an understanding of professional and ethical responsibility
- g) an ability to communicate effectively
- h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context
- i) a recognition of the need for, and an ability to engage in life-long learning
- j) a knowledge of contemporary issues
- k) an ability to use the techniques, skills and modern engineering tools necessary for chemical engineering practice

9. **Tentative Schedule**

week	dates	book chapters	
1	1/17/2017	Chapter 1	
	1/20/2017	Chapter 1	
2	1/24/2017	Chapter 1	
	1/27/2017	Chapter 2	
3	1/31/2017	Chapter 2	
	2/3/2017	Chapter 2	
4	2/7/2017	Chapter 2/3	
	2/10/2017	Chapter 3	
5	2/14/2017	Chapter 3	
	2/17/2017	Chapter 3	
6	2/21/2017	Chapter 4	
	2/24/2017	Chapter 4	
7	2/28/2017	Chapter 4	
	3/3/2017	Chapter 6	
8	3/7/2017	Chapter 6	
	3/10/2017	1st exam	
9	3/14/2017	no class	
	3/17/2017	no class	
10	3/21/2017	Chapter 11	
	3/24/2017	Chapter 11	3/27 last day to withdraw
11	3/28/2017	Chapter 11	
	3/31/2017	Chapter 11	
12	4/4/2017	Chapter 12	
	4/7/2017	Chapter 12	
13	4/11/2017	Chapter 12	
	4/14/2017	no class	
14	4/18/2017	Chapter 12/14	
	4/21/2017	Chapter 14	
15	4/25/2017	Chapter 14	
	4/28/2017	Chapter 14	
16	5/2/2017	presentation	Friday schedule
	5/3/2017	reading	
	5/4/2017	reading	

TBD

Final exam

**10. HW problems**

<b>Chapter</b>	<b>HW problems</b>
Chapter 1	26, 31, 52, 58, 60, 66, 68, 81, 84, 86, 161,163
Chapter 2	60, 62, 69, 74, 75, 83,99,103, 114
Chapter 3	53,71,88,124, 130,190
Chapter 4	29,48,58,68,72,80,94, 107
Chapter 6	11, 18, 22,40,60,78,85, 90
Chapter 11	53, 77, 114, 121, 148, 150, 152, 158
Chapter 12	24, 28, 38, 49, 74
Chapter 14	39, 44, 48, 59, 78, 84, 107, 150