

# NIU Course Syllabus for Physics 463/563

## Thermodynamics, Kinematic Theory, and Statistical Mechanics

Fall 2014, Tuesdays and Thursdays, 3:30-4:45 pm

*Prerequisites: PHYS 320*

**Class room:** FR 237 (we may move to a larger room)

**Instructor:** Yasuo Ito, Ph.D. La Tourette 218

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**Office Hours:** Tuesdays and Thursdays, 2:00 pm – 3:00 pm ; Other hours by an appointment.

**Text book:** Classical and Statistical Thermodynamics, A. H. Carter (required). Other references such as “*Concepts in Thermal Physics*” by S.J. Blundell and K.M. Blundell. Please read your textbook before coming to the class!!

**The view graphs, homework assignments and their solutions will be posted on the Blackboard web course. Therefore, it is essential for you to familiarize with the Blackboard web course.**

**Grading (tentative):**

**40% Homework** *ESSENTIAL* The deadline is usually 1 week after the last lecture of each chapter.

**25% Midterm Exam** Thursday **October 2nd and October 30th** in class.

**35% Final Exam** (comprehensive) Tuesday **December 9, 4 – 5:50 pm.**

To pass this course, you must score at least **50%** on the homework **AND** at least **50%** overall.

**Attendance is required.**

**Grading scale:**

**PHYS 463:**

A ( $90 \leq x$ ), A- ( $85 \leq x < 90$ ), B+ ( $80 \leq x < 85$ ), B ( $75 \leq x < 80$ ), B- ( $70 \leq x < 75$ ), C+ ( $65 \leq x < 70$ ), C ( $55 \leq x < 65$ ), D ( $50 \leq x < 55$ ), F ( $x < 50$ ).

**PHYS 563:**

A ( $90 \leq x$ ), A- ( $85 \leq x < 90$ ), B+ ( $80 \leq x < 85$ ), B ( $75 \leq x < 80$ ), B- ( $70 \leq x < 75$ ), C+ ( $65 \leq x < 70$ ), C ( $60 \leq x < 65$ ), C- ( $55 \leq x < 60$ ), D ( $50 \leq x < 55$ ), F ( $x < 50$ ).

**Grade points (assigned by University):**

PHYS 463: A (4.00), A- (3.67), B+ (3.33), B (3.00), B- (2.67), C+ (2.33), C (2.00), D (1.00), F (0.00).

PHYS 563: A (4.00), A- (3.67), B+ (3.33), B (3.00), B- (2.67), C+ (2.33), C (2.00), C- (1.67), D (1.00), F (0.00).

**(Tentative schedule)**

**0: Introduction to the course:** August 26, 2014

**1: Review of Thermodynamics** (Ch. 1- 10) *HW. Summarize Thermodynamics definitions, laws and their applications. 10 – 15 pages.*

**2: The Kinetic Theory of Gases** (Ch. 11)

**3: Statistical Thermodynamics** (Ch. 12)

**4: Classical and Quantum Statistics** ((Ch. 13)

**Mid-Term I: October 2nd, Thursday**

**5: The Classical Statistical Treatment of an Ideal Gas** (Ch. 14)

**6: The Heat Capacity of a Diatomic Gas** (Ch. 15)

**7: The Heat Capacity of Solid** (Ch. 16)

**Mid-Term II: October 30th, Thursday**

**8: The Thermodynamics of Magnetism** (Ch. 17)

**9: Bose-Einstein Gases** (Ch. 18)

**10: Fermi-Dirac Gases** (Ch. 19)

**(11: Information Theory** (Ch. 20))

**Final Exam** (Tuesday, December 9, 2014, 4:00 – 5:50 pm)

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## ***From the University***

### **Academic Integrity:**

Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university.

A faculty member has original jurisdiction over any instances of academic misconduct that occur in a course which the faculty member is teaching. The student shall be given the opportunity to resolve the matter in meetings with the faculty member and the department chair. If the facts of the incident are not disputed by the student, the faculty member may elect to resolve the matter at that level by levying a sanction no greater than an F for that course. The faculty member shall notify the student in writing whenever such action is taken, and the [Office of Community Standards and Student Conduct](#) shall receive a copy of the Academic Misconduct Incident Report indicating final disposition of the case, which will be placed in the student's judicial file. In all matters where the charge of academic misconduct is disputed by the student or if the faculty member feels a sanction greater than an F in the course is appropriate (such as repeated offenses or flagrant violations), the faculty member shall refer the matter to the Office of Community Standards and Student Conduct making use of the Academic Misconduct Incident Report. Additional sanctions greater than an F in a course can be levied only through the University Judicial System. With regards to finding the student either responsible or not responsible for his or her action, the ruling of the Judicial Hearing Board shall be binding. In cases where there is either a finding of responsibility or an admission of responsibility by the student, any recommendations by the hearing board regarding the course grade are non-binding on the instructor, who remains solely responsible for assigning a course grade, consistent with the policies set forth in the course syllabus.

### **Attendance:**

The university does not use a "cut" system. Each instructor decides whether to excuse class absences and determines how to permit make-up work.

If a student will be absent from classes for a week or more because of an accident, illness, or other emergency, instructors will be notified of the absence only if students or their parents request it through the Division of Student Affairs. [Health Services](#) will not release information about students unless they provide a written request.

Leaves of absence will be granted for volunteer services related to disaster relief in accordance with applicable Illinois statutes or executive orders issued by the State of Illinois in response to emergency situations. To initiate a leave of absence, students should contact their College Dean's office, or the vice provost (or the vice provost's delegate) for any student who has no college affiliation. Following the period of volunteer service, Registration and Records will facilitate reenrollment of the student.

Students are expected to comply with each individual instructor's established attendance policy. It is recommended that students avoid registering for classes in which they would amass significant absences. In the case of an absence due to required attendance at a university-sponsored event such as a department trip, performing arts activity, ROTC function, or athletic competition, reasonable attempts shall be made by faculty members to allow the student to make up missed work. Students are responsible for completing the work assigned and/or due on the days they are absent for university-sponsored events. Both the sponsoring unit and the student should inform the faculty member as soon as possible in the semester in order for arrangements to be made for completing missed assignments, examinations or other required course work. The student is required to provide each instructor with an official notification in advance of the absence (e.g., a letter from the chair of the sponsoring department, the head of the sponsoring unit, or the coach).

### ***For disabled students:***

A student who believes that reasonable accommodations with respect to course work or other academic

requirements may be appropriate in consideration of a disability must (1) provide the required verification of the disability to **the Disabilities Resource Center (former CAAR)**, (2) meet with **the Disabilities Resource Center** to determine appropriate accommodations, and (3) inform the faculty in charge of the academic activity of the need for accommodation. Students are encouraged to inform the faculty of their requests for accommodations as early as possible in the semester, but must make the requests in a timely enough manner for accommodations to be appropriately considered and reviewed by the university. If contacted by the faculty member, the staff of **the Disabilities Resource Center** will provide advice about accommodations that may be indicated in the particular case. Students who make requests for reasonable accommodations are expected to follow the policies and procedures of **the Disabilities Resource Center** in this process, including but not limited to the Student Handbook.

A wide range of services can be obtained by students with disabilities, including housing, transportation, adaptation of printed materials, and advocacy with faculty and staff. Students with disabilities who need such services or want more information should contact the [Disabilities Resource Center](#) at 815-753-1303.

The Disabilities Resource Center office is located on the 4th floor of the University Health Services building (815-753-1303). I look forward to talking with you soon to learn how I may be helpful in enhancing your academic success in this course.”