Course Syllabus for

PHYB52H

Thermal Physics

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COURSE DESCRIPTION: *The quantum statistical basis of macroscopic systems; definition of entropy in terms of the number of accessible states of a many particle system leading to simple expressions for absolute temperature, the canonical distribution, and the laws of thermodynamics. Specific effects of quantum statistics at high densities and low temperatures.*

In this course you will begin to learn how to analyse systems that contain many (effectively uncountably large) numbers of particles. The course has basically two parts: thermal physics assumes no knowledge that particles even exist (it is continuum mechanics); statistical mechanics looks at systems where you have knowledge of the individual particles, typically from quantum mechanics, and allows you to deduce the large-scale, collective (and emergent) properties of a large number of particles.

LECTURES:

Please respect others, including the professor, in the classroom. Turn your cell phones to silent mode. Do not play 'Angry Birds' or watch TV shows. If you are bored, please don't distract others.

All lectures and practicals will be treated the same. They are not going to be 2 hours of lecture one day and 2 hours of practicals another. Instead, each 2 hour block will be a mix of lecturing and group-based problem solving in a practical format. Most 2 hour sections will end with a quiz based on the material covered. It will be assumed that you have read the textbook before lectures and practicals.

COURSE MATERIAL:

An Introduction to Thermal Physics by Daniel V. Schroeder. Copies are available at the UTSC bookstore.

OFFICE HOURS:

TBD. If you cannot make them it may be possible to schedule occasional office hours at different times. Please setup an appointment via e-mail, and expect it to take a few days (so don't wait until the day before a test to try to visit).

E-MAIL:

brian.wilson@utoronto.ca

If I do not reply within 48 hours, you should send me a reminder e-mail as my in-box can get rather full. E-mail should be used for setting up appointments or for private matters. Otherwise, please use the discussion boards on Blackboard.

ASSESSMENT:

FINAL EXAM:	40%
2 TERM TESTS:	40% (20% each)
PROJECT:	10%
HOMEWORK:	10%

TESTS AND EXAM:

Both the term tests and final exam will draw from the lectures, practicals and textbook. All tests and exams are cumulative.

The tests will be 1.5 hours, dates TBD. The exam will be 3 hours. You are allowed to bring one aid sheet, hand-written. You may use both sides. A calculator may prove useful.

If you do poorly on a term test, you will have the option of moving half its weight (10%) to the final exam. You can do this for one or both tests. The deadline for making the decisions will be about one week after you get your grade back for each test.

The tests and exams will be a combination of qualitative and quantitative. You can expect to see both calculations and conceptual questions.

PROJECT:

On March 8 you will have to submit an individual paper (on actual paper, no electronic submissions) on a project of your choosing. You must consult with me for approval of your project unless you pick one from the list of suggested topics. Details of the study, including a list of suggested topics, will be posted on Blackboard. The late penalty is -3% per business day (Monday through Friday).

The projects are individual projects and they should not involve much collaboration with other students. You must not plagiarize, so be sure to properly cite or reference any material which you include in your report which you did not create yourself. This includes (but is not limited to) any figures or diagrams you acquire from the Internet, even if they are public domain.

UTSC offers good support for academic English skills development. I suggest you start with http://www.utsc.utoronto.ca/eld/. I recommend that you look into this before Reading Week.

HOMEWORK:

There will be weekly homework assignments due at 5pm on Thursdays. The first one is due January 14. These assignments will be equally weighted. Your worst result will be dropped before calculating your average homework grade. Late assignments will lose -10% per business day.

CONCERNS?

If you have any concerns about the course and your ability to do well, please come see me and we can discuss your situation. I am happy to make reasonable accommodations to ensure that all students have an equal opportunity to do well in this course. You can also speak with the people at ACCESS*Ability* Services who can advise us both.

TENTATIVE LECTURE SCHEDULE

The following is a tentative schedule, and it may change. I have included the weeks that I requested for the term tests, but I have no control over when they actually schedule the tests, so they may not be during those weeks.

- Week 1 – Chapter 1, first half
- Week 2 – Chapter 1, second half
- Week 3 – Chapter 2, first half
- Week 4 – Chapter 2, second half
- Week 5 – Chapter 3, first half
- Week 6 – Chapter 3, second half (First test?)
- Reading Week – do your project
- Week 7 – Chapter 4, sections 4.1 and 4.2
- Week 8 – Chapter 5, sections 5.1 and 5.2
- Week 9 – Chapter 6, first half (Project Due)
- Week 10 – Chapter 6, second half (Second test?)
- Week 11 – Chapter 7, sections 7.1 to 7.3
- Week 12 – Chapter 7, sections 7.1 to 7.3