

## General Course Information

### PHYS310 and PHYS440 - 2020 Thermal, Statistical and Particle Physics

0.125 EFTS    15 Points  
First Semester

#### Course Coordinator

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**Timetable (As at week 1)**  
**Please see page 2**

#### Description

This course provides an introduction to the study of the physical properties of matter. It integrates the study of thermal properties of matter in bulk (thermodynamics) with the molecular/atomic approach (statistical physics). The particle physics is further extended to subatomic scales with an introduction to the phenomenology of nuclear structure, radiation processes and the standard model of particle interactions.

#### Assessment

- There is **NO FINAL EXAM** for PHYS310/440

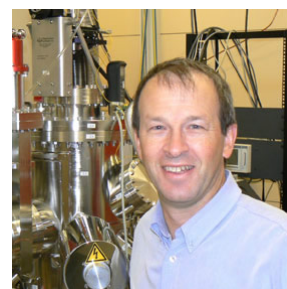
**The THREE sections of PHYS310/440 will be assessed independently in the form of 60 minute tests and homework with equal proportion between sections.**

30%    HW Assignments.  
70%    Three independent tests  
          1. Thermodynamics Test: TBA  
          2. Statistical Mechanics Test: TBA  
          3. Nuclear and Particle Physics Test, TBA

❖ PHYS440 students will have extra assessment questions.

If you are **absent** from the test or exam, or if you consider that your performance in the test or exam was impaired, then you can apply for **Special Consideration**. Action **MUST** be taken within 5 days of the assessment.

The link with details can be found at  
<http://www.canterbury.ac.nz/exams/special-consideration.shtml>



## Textbook

Your textbook from PHYS200, Serway, R A; Moses, C J; Moyer, C A. Modern physics. 3rd ed. will be a very good reference for many of the topics in PHYS310. However, you should not limit yourself to the discussion from just one author. Some other books that may be useful are:

## Thermal and Statistical Mechanics

Thermal Physics (1980)	Kittel
Thermal Physics (1991)	Sprackling
Thermal physics: an introduction to thermodynamics, statistical mechanics, and kinetic theory (1988)	Riedi, P. C
Thermodynamics: principles and applications (1971)	Andrews, Frank C
Introductory Statistical Mechanics (1996)	Bowley and Sanchez
An Introduction to Statistical Thermodynamics (1995)	Gasser
Thermodynamics and Statistical Mechanics	Greiner et al
Thermodynamics, kinetic theory, and statistical thermodynamics: (1975).	Sears and Salinger.

## Particle Physics

Nuclear and Particle Physics (1991)	Williams
Particle physics 1997.	Martin and Shaw
Nuclear and particle physics (1975)	Frauenfelder, Hans,
Nuclear and particle physics source book (1988).	Parker
Nuclear and radiochemistry : fundamentals and applications (1997)	Karl Heinrich Lieser.

## Notes

Some course material will be available on the Learn system: <http://learn.canterbury.ac.nz/>

## General Physics and Astronomy Course Information

Please consult the document General Information for Physics and Astronomy Students on the School Web Page:

<http://www.phys.canterbury.ac.nz/courses/>

specifically:

<http://www.phys.canterbury.ac.nz/courses/general.pdf>

## Timetable: DRAFT in Week 1

PHYS310 2020	Monday	Lecture	Mon	Tue	Tues	Wed	Wed	Thu	Fri
Terms 1 & 2	Date	Week		12PM Psych252	4pm	3PM Psych252		12PM Psych252	
	10-Feb								
	17-Feb	1		Therm L1		Therm L2		Therm L3	
PHYS310 Thermal, Statistical and Nuclear Physics	24-Feb	2		Therm TUT/HW1 out		Therm L4		Therm L5	
	2-Mar	3	HW1 IN	NO CLASS		NO CLASS		Therm TUT/HW2 Out	
	9-Mar	4		Therm L6		Therm L7		Therm L8	HW2 IN HW3 OUT
	16-Mar	5		Therm TUT		SM L1		SM L2	HW3 IN
	23-Mar	6		SM L3	THERM TEST	SM L4		SM TUT/HW4 Out	
	30-Mar	7		SM L5		SM L6		SM TUT/HW4 In, HW5 out	
	6-Apr								
	13-Apr								
	20-Apr								
	27-Apr	8		SM L7	HW5 IN	SM L8		SM TUT	
	4-May	9		Nucl	SM TEST	Nucl		Nucl	
	11-May	10		Nucl		Nucl		Nucl	
	18-May	11		Nucl		Nucl		Nucl	
	25-May	12		Nucl		Nucl		Nucl	
	1-Jun								
	8-Jun								
	15-Jun								