



MECH4880

**REFRIGERATION AND AIR
CONDITIONING**



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I. Staff contact d

Contact details and consultation times for course convenor

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Contact details and consultation times for additional lecturers/demonstrators/lab staff

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Consultation concerning this course is available on Tuesdays 11:00-12:00 unless otherwise advised; direct consultation or phone is preferred; email should only be used as a last resort as it uses your time and mine less efficiently



Credit Points

This is a 6 unit-of-credit (UoC) course, and involves three (3) hours per week (h/w) of face-to-face contact.

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all assessable work. Thus, for a full-time enrolled student, the normal workload, averaged across the 16 weeks of teaching, study and examination periods, is about 37.5 hours per week.”

This means that you should aim to spend about 9 h/w on this course. The additional time should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

Contact hours

	Day	Time	Location
Lectures	Tuesday	6pm – 9pm	K-B16-LG05 - Colombo Theatre C
CAMEL Workshop (Week 6)	Tuesday	6pm – 9pm	K-J17-204 - Ainsworth 204

Summary of the course

This course introduces the student to the terminology, principles and methods used in refrigeration and air conditioning.

Aims of the course

The aim of this course is to take your knowledge of thermodynamics further, and in a much more general fashion, than you obtained in your first course in thermodynamics. In particular, to extend your theoretical background of the thermodynamics of refrigeration and air conditioning.

But precisely what do we mean by Air Conditioning and Refrigeration?

The term air conditioning implies the creation and maintenance of an atmosphere having such conditions of: (i) temperature, (ii) humidity, (iii) air circulation and (iv) air purity, as to

Student learning outcomes

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Be familiar with the terminology associated with refrigeration & air conditioning	PE1.3
2. Apply the basic principles of psychrometry and applied psychrometrics	PE1.1
3. Undertake system analysis and mathematical modelling	PE1.1, PE1.2
4. Perform load calculation	

4. Course schedule

A schedule of lectures for each week and relevant readings from the textbook and other reference material is shown in Table 1.

Table 1 Lecture Schedule

Week	Topic	Relevant Reading
1	Introduction Psychrometry	Chapter 1 &2 Chapter 3
2	Applied Psychrometrics	Lecture Notes
3	Air Conditioning	Lecture Notes Chapter 3
4	Cooling and Heating Loads	DA9; Chapters 5-8
5	Quiz and Air Duct Design and Refrigerants	Chapters 11 & 12 and lecture Notes
6	Use of Camel Program	Special Workshop in K-J17-204 - Ainsworth 204
7	Components of Vapour Compression Systems and System Modelling	Lecture Notes
8	Vapour Compression Refrigeration	Chapter 15
9	Laboratory Class	Laboratory Class in K-J17-116
10	Multi Stage Vapour Compression Systems	Lecture Notes
11	Assignment Assistance	TBA
12	Other Types of Cooling Systems	Lecture Notes Chapter 14
13	TBA	

Note: The above schedule is subject to change at short notice to suit exigencies.

5. Assessment

General

You are assessed by way of two assignments, one quiz, and examination which involve both calculations and descriptive material. These assessments test your grasp of the principles involved, and are typical of the calculations you will be expected to perform as graduate mechanical engineers.

All assessments must be attempted

It is always worth submitting late assessment tasks when possible. Completion of the work, even late, may be taken into account in cases of special consideration.

Examinations

You must be available for all tests and examinations. Final examinations for each course are

List of required and suggested additional readings and availability (in bookshop, UNSW library, Open Reserve)

ASHRAE Fundamentals, American Society of Heating, Refrigeration and Air Conditioning Engineers, (2005).

Jones, W.P., *Air Conditioning Engineering*, 3rd Ed., Edward Arnold, (1985).

Stoecker, W.F. and Jones, J.W., *Refrigeration and Air Conditioning*, 2nd Ed., McGraw-Hill Book Co., (1982).

