Course Outline

Term 3 2010

MECH4880

REFRIGERATION AND AIR CONDITIONING

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1. Staff contact details

The normal workload expectations of a student are approximately 25 hours per term for each UOC, including class contact hours, other learning activities, preparation and time spent on all assessable work.

You should aim to spend about 12 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**
Lecture / Coaching	Tuesday	9am – 11am	K-B16-LG05- Columbo Theatre C
Lecture / Coaching	Wednesday	2pm – 4pm	K-G15-190– Webster Theatre A
CAMEL Workshop (Week 5)	Wednesday	2pm – 5pm*	K-J17-203 Ainsworth 203
Laboratory Class (Week 7)	Tuesday	9am – 1pm*	K-J17-214A – Willis Annexe 214A

* Additional session time

Summary and Aims of the course

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

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.

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 produce the desired effects upon the occupants or materials (or both) in a given space. It is the simultaneous control of all these four factors within required limits which defines an air conditioning system.

Familiarise you with load calculations and elementary duct design
Familiarise you with refrigerants; vapour compression refrigeration and multi-stage vapour compression systems
Understand the components of vapour compression systems and other types of cooling systems.

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 calculations and elementary duct design	PE1.1, PE1.2, PE1.3, PE1.5 PE2.1, PE3.2, E3.5
5.	Be familiar with refrigerants; vapour compression refrigeration systems	PE1.1, PE1.2, PE1.3, PE1.5, PE2.1, PE2.2
6.	Understand the components of vapour compression	

6 Assessment

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.

Assignments

Presentation

10. Administrative matters and links

All students are expected to read and be familiar with School guidelines and polices, available on the intranet. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Computing Facilities
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Disability Support Services
- Health and Safety
- Lab Access

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice