



Course specification

Description: Heat and Mass Transfer						
Subject	Cat-nbr	Class	Term	Mode	Units	Campus
MEC	4103	40487	1, 2005	EXT	1.00	Toowoomba

Academic group:	FOENS
Academic org:	FOES02
Student contribution band:	2
ASCED code:	030799

STAFFING

Examiner: Ruth Mossad
Moderator: David Buttsworth

REQUISITES

Pre-requisite: MEC3102

RATIONALE

Heat transfer and mass transfer are necessary processes in virtually all forms of energy generation and use; from coal fired to nuclear power stations, from automobile engines to rocket motors, from refrigerating cold stores to air conditioning space vehicles. A sound knowledge of this field is essential to all mechanical engineers.

SYNOPSIS

This course further develops the basic physics concepts and principles of heat transfer in its three different modes. The three modes are conduction, convection and radiation. Application of these principles to practical industrial applications is an important aspect of this course. It also introduces the principles of mass transfer and applies them to common industrial situations.

OBJECTIVES

On completion of this course, students should be able to:

1. identify the various modes of heat transfer that are taking place in a particular system;
2. analyse and design simple and complex thermofluids systems working at steady or non steady situations using analytical and numerical methods;
3. modify existing designs to achieve high efficiency.

TOPICS

Description	Weighting (%)
1. Basic modes of heat transfer	12.00

2.	Conduction	16.00
3.	Numerical analysis of heat conduction	10.00
4.	Analysis of convection heat transfer	8.00
5.	Natural convection	8.00
6.	Forced convection inside tubes and ducts	8.00
7.	Forced convection over exterior surfaces	8.00
8.	Heat exchangers	15.00
9.	Heat transfer by radiation	15.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

Kreith, F & Bohn, MS 2001, *Principles of Heat Transfer*, 6th edn, Brooks/Cole Publishing, California.

REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Chapman, AJ 1989, *Heat Transfer*, 4th edn, MacMillan, New York.

Holman, JP 1990, *Heat Transfer*, 7th edn, McGraw Hill, New York.

Incropera, FP & De Witt, DP 1996, *Fundamentals of Heat and Mass Transfer*, 4th edn, Wiley, New York.

Ozisik, MN 1985, *Heat Transfer, A Basic Approach*, McGraw Hill, New York.

Rogers & Mayhew 1992, *Engineering Thermodynamics Work and Heat Transfer*, Longmans, England.

White, FM 1988, *Heat and Mass Transfer*, Addison Wesley, Reading, Mass.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessment	15.00
Directed Study	62.00
Examinations	3.00
Private Study	75.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
ASSIGNMENT 1	150.00	15.00	22 Apr 2005
ASSIGNMENT 2	150.00	15.00	03 Jun 2005
3 HOUR OPEN EXAMINATION	700.00	70.00	END S1 (see note 1)

NOTES

1. Student Administration will advise students of the dates of their examinations during the semester.

IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:
There are no attendance requirements for this course. However, it is the students' responsibility to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements for students to complete each assessment item satisfactorily:
(i) To complete each of the assignments satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) for each assignment. (ii) To complete the examination satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) for the examination.
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without prior approval then a penalty of 10% of the total marks gained by the student for the assignment will apply for each working day late.
- 4 Requirements for student to be awarded a passing grade in the course:
To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by satisfactorily completing all summative assessment items (the examination and assignments), as stated in 2 above.
- 5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.
- 6 Examination information:
In an Open Examination, candidates may have access to any material during the examination except the following: electronic communication devices, bulky materials, devices requiring mains power and material likely to disturb other students.
- 7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
- 8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL

<http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

ASSESSMENT NOTES

- 1 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.
- 2 Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.
- 3 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.
- 4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.
- 5 The Faculty will NOT accept submission of assignments by facsimile.
- 6 Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.
- 7 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.
- 8 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded one of the temporary grades: IM (Incomplete - Make up), IS (Incomplete - Supplementary Examination) or ISM (Incomplete -Supplementary Examination and Make up). A temporary grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non directed personal study.
- 9 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

OTHER REQUIREMENTS

- 1 Students will require access to e-mail and internet access to USQConnect for this course.
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