Course Outline

Term 2 2019

MECH3610

ADVANCED THERMOFLUIDS

Contents

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1. Staff contact d

Contact details and consultation times for course convenor

Course Convenor
Name: Dr Charitha de Silva
Office location: J17 Ainsworth Building Room 311/H
Email: c.desilva@unsw.edu.au

Course Lecturer
Name: Naomi Tsafnat
Email: n.tsafnat@unsw.edu.au

Head Demonstrator
Name: Joshua Pham
Email: z5059367@zmail.unsw.edu.au

All non-personal matters should be addressed through forums in the first instance. Personal administrative matters should be directed to the Head Demonstrator, then to the Course Convener only if matters remain unresolved.

Other Demonstrators

3. Course details

Credit points

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

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 15 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	4pm - 6pm	Rex Vowels Theatre (F17-LG3)
	Friday	11am - 1pm	Law Theatre(F8-G04)
Problem Solving Sessions	Wednesday	9am 11am	

areas will be applied to heat exchanger and cooling fin design, which will include experiments on heat transfer mechanisms to validate theoretical calculations.

Problem solving sessions provide the opportunity for students to test their conceptual framework on problems.

The Laboratories focus on the Heat Transfer component of the course and provide students the opportunity to compare specific parts of the theory to practical results in a controlled environment. This is to encourage students to consider the practical implications of their theoretical learning.

The Assignment will cover theory from the second half of the course and give students the opportunity to research a specific area of engineering knowledge in depth.

Moodle forum discussions provide an opportunity to further explore and discuss content. Students are encouraged to seek other learning resources and share them on the forums for the benefit of all.

5. Course schedule

Week	Date	Name	Topics	Reading**
1	3 -7 June	Introduction to Heat Transfer / Conduction	Heat Transfer Overview; Units and Dimensions; Heat Diffusion Equation; Conduction	ÇG: 1 & 2
2	10 -14 June	Conduction and Transience	1D Steady State Conduction; Extended Fins; Transient Conduction; Lumped Capacitance Method.	ÇG 3, 4 & 5
3	17 -21 June	Convection	Convection; Forced / Free (Natural) Convection	ÇG: 6 & 7
4	23-28 June	Heat Exchangers / Radiation		

Week	Date	Name	Topics	Reading**
10	5-9 Aug	Combustion	Relations; Chemical Equation Balancing; Heat of Combustion; Adiabatic Flame Temperature Chemical Equilibrium; Le Chatelier's principle	ÇB: 15 & 16
11	12 Aug	Revision		

**** Notes on recommended readings:**

ÇG: *Heat and Mass Transfer, Fundamentals and Applications*, 5th Edition in SI Units by Yunus Çengel and Afshin Gg.t jcg.t jcg.oar00008871 0 595.32 841.92 reW* nBT/F1 11.04 Tf1 0 0 1 144.26

6. Assessment

Assessment overview

Assessment	Length	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
Heat Transfer Formative Quiz	2 hours	0%	1				

Formative Quiz

There will be a Moodle quiz held in Week 4 to give students the opportunity to verify that they have understood the material so far. This quiz has a zero percent (0%) weighting and does not contribute to your overall course mark; however students are encouraged to participate.

The quiz will be open at the start of Week 4.

It is intended that the style and difficulty of the Moodle quiz will be representative of that in the final Mid Term exam although marking and feedback comments will be automatically applied by computer marking.

Assignments

Presentation

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Submission

The submission of online material should follow the instructions given on the appropriate Moodle page.

Online submissions are required to be submitted via Moodle. No cover sheet is required as all assignments will be identified through your Moodle account. *All digital assignments are due by 5pm on the due date.* An additional allowance will be granted automatically to submit assignments until 11:55pm without penalty, but you accept any risk of technical difficulties with submission. *If you try to submit between 5pm and 11:55pm and Moodle does not accept the submission for any reason, the assignment will be considered late.*

Work submitted late without an approved 4ps45(t)-4(on)3(si)5oen by the course ccordinor or lps45(t)-4(ed)3

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem

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or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:
www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

10. Administrative matters

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

- Attendance
- UNSW Email Address
- Computing Facilities
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Student Equity and Disabilities Unit
- 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
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability	PE2.1 Application of established engineering methods to complex problem solving
	PE2.2 Fluent application of engineering techniques, tools and resources
	PE2.3 Application of systematic engineering synthesis and design processes
	PE2.4 Application of systematic approaches to the conduct and management of engineering projects
PE3: Professional and Personal Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (professional and lay domains)
	PE3.3 Creative, innovative and pro-active demeanour
	PE3.4 Professional use and management of information
	PE3.5 Orderly management of self, and professional conduct
	PE3.6 Effective team membership and team leadership