Course Outline

Semester 2 2015

MECH 4620

COMPUTATIONAL FLUID DYNAMICS

4. Teaching strategies

Lectures in the course are designed to cover the terminology and core concepts and theories in CFD. They do not simply reiterate the texts, but build on the lecture topics using examples taken directly from industry to show how the theory is applied in practice and the details of when, where and how it should be applied.

Lab sessions are designed to provide you with feedback and discussion on the assignments, and to investigate problem areas in greater depth to ensure that you understand the application and can avoid making the same mistake again.

5. Course schedule

Week	***Lecturer***	***Topic***	***Work during laboratory session***	***DUE (Friday)***
1	GHY	Introduction to CFD and ANSYS CFX	Backward facing step exercise Problem setup	-
2	GHY	Defining a CFD		

Assessment Criteria

The following broad criteria will be used to grade assignments, while the major assignment will have more specific criteria incorporated into the report template when issued:
For report-style assignments the following criteria will be used:

- Identification of key facts and the integration of those facts in a logical development.
- Clarity of communication—this includes development of a clear and orderly structure and the highlighting of core arguments.
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7. Expected Resources for students

Suggested textbooks (either):

1. J.Y. Tu, G.H. Yeoh, and C. Liu, Computational Fluid Dynamics: A Practical Approach, 2nd Edition, 2012.
2. H.K. Versteeg and W. Malalasekera, An introduction to Computational Fluid Dynamics. The Finite Volume Method, 2nd Edition

Other references:

1. J.D. Anderson, Computational Fluid Dynamics.
2. P.J. Roache, Fundamentals of Computational Fluid Dynamics.
3. P.J. Roache, Verification and Validation in Computational Science and Engineering.
4. J.C. Tannehill, D.A. Anderson and R.H. Pletcher, Computational Fluid Mechanics and Heat Transfer.
5. S.V. Patankar, Numerical Heat Transfer and Fluid Flow.
6. D.C. Wilcox, Turbulence modelling for CFD.

All of the above textbooks can be found in the UNSW Library website:
http://info.library.unsw.edu.au/web/services/services.html

Recommended Internet sites

www.ansys.com
www.cfd-online.com

Additional materials provided in UNSW Moodle

This course has a website on UNSW Moodle which includes:

copies of assignments (as they are issued, in case you missed the hand-out in class);
tutorial-style problems;
discussion forum;
links to any useful material discussed in class.

The discussion forum is intended for you to use with other enrolled students. The course convenor and/or demonstrators will occasionally look at the forum, monitor any inappropriate content, and take note of any frequently-asked questions, but will only respond to questions on the forum at their discretion. If you want help from the convenor then direct contact is preferred.

8. Course evaluation and development

The course has been redesigned in 2015 and will be evaluated at the end of this semester. Feedback on the course is gathered periodically using various means, including the Course and Teaching Evaluation and Improvement (CATEI) process, informal discussion in the final class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

In this course, recent improvements resulting from student feedback include a reduction in the amount of code-writing required and also the introduction of a major assignment with the topic of the student's choice.

9. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism: https://student.unsw.edu.au/plagiarism The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

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 fixed. However more serious instances in first year, such as stealing another student's work 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: http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Further information on School policy and procedures in the event of plagiarism is presented in a School handout, Administrative Matters, available on the School website.

10. Administrative Matters

You are expected to have read and be familiar with *Administrative Matters*, available on the School website: https://www.engineering.unsw.edu.au/mechanical-engineering/sites/mech/files/u41/S1-2015_Admin-Matters.pdf

Appendix A: Engineers Australia (EA) Professional Engineer Competency Standards

	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