MECH2002

Fluid Mechanics

Session 1, Weekday attendance, North Ryde 2021

School of Engineering

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to timetable viewer. To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff Fatemeh Salehi fatemeh.salehi@mq.edu.au Room 121, 44 Waterloo Rd Monday 1-3 pm
Credit points 10
Prerequisites (MECH1001 or ENGG1050 or ENGG150 or CIVL1001 or PHYS140) and (MATH1025 or MATH1020 or MATH136 or MATH133)
Corequisites
Co-badged status
Unit description This unit will examine the basic concepts of fluid mechanics. It will examine the roles of static fluid systems, dynamic fluid systems, and techniques to analyse these systems. This will include the concepts of pressure and head; hydrostatics; buoyancy; fundamental laws of fluid motion; accounting for losses, experimental and numerical techniques.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Exhibit proficiency in mathematical analysis, and the application of physics, associated with fluid mechanics.

ULO2: Explain the fundamentals of static and dynamic fluid systems.

ULO3: Analyse simple static and dynamic fluid problems applied to real world problems.

ULO4: Apply appropriate technology to investigate more complex fluid flow problems.

General Assessment Information

Student Responsibilities

Be familiar with University policy and College procedures and act in accordance with those policies and procedures.

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

Notifications

Formal notification of assessment tasks and due dates will be posted on iLearn. Although all reasonable measures to ensure the information is accurate, The University reserves the right to make changes without notice. Each student is responsible for checking iLearn for changes and updates.

Assignment submissions and plagiarism policies

All assignments and reports must be submitted electronically through iLearn (in pdf format) unless otherwise explicitly stated. For details on the policies of academic penalties relating to academic honesty, please refer to the policies and procedures section below.

Submissions are expected to be typed set in a logical layout and sequence and graphs are expected to be drawn using suitable software. Markers WILL NOT grade poorly organized or illegible scans or drafts. The expected workload includes preparation of final copies and clear diagrams.

Late submissions

Late submissions or absences from tutorials and laboratories will not be accepted. In the event that an assignment or report is submitted late, between 0 and 24 hours a deduction of 25% will be made, between 24 and 48 hours a deduction of 50% will be made, more than 48 hours will result in no marks being awarded. Extenuating circumstances will be considered upon lodgement of a formal notice of disruption of studies.

Grading and passing requirement for unit

For further details about grading, please refer below in the policies and procedures section. In order to pass this unit, a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

Final Examinations

Final examinations will typically take place at the end of the semester. For further information, please refer to the Examination Timetable website on www.mq.edu.au

Additional information

Tutorial sessions commence in Week 2.

There are five practical (laboratory) sessions which are on Week 4, 5, 7, 9, and 12. Refer to iLearn for more details.

Assessment Tasks

Name	Weighting	Hurdle	Due
Diagnostic Test	5%	No	Week 2
Fluid Static Laboratory Reports	8%	No	Week 6
Mid Session Test	15%	No	Week 7
Simulation Assignment	10%	No	Week 12
Fluid Dynamic Laboratory Reports	12%	No	Week 13
Final examination	50%	No	Exam period

Diagnostic Test

Assessment Type [1]: Examination
Indicative Time on Task [2]: 2 hours
Due: **Week 2**
Weighting: **5%**

An opportunity for students to assess if they have the necessary knowledge to successfully complete this unit. A portion of this assessment work will be conducted during learning activities.

On successful completion you will be able to:

- Exhibit proficiency in mathematical analysis, and the application of physics, associated with fluid mechanics.

Fluid Static Laboratory Reports

Assessment Type [1]: Lab report
Indicative Time on Task [2]: 5 hours
Due: **Week 6**
Weighting: **8%**

Laboratory reports written for two unique experiments demonstrating two different fluid static principles. A portion of this assessment work will be conducted during learning activities.

On successful completion you will be able to:

- Explain the fundamentals of static and dynamic fluid systems.
- Analyse simple static and dynamic fluid problems applied to real world problems.

Mid Session Test

Assessment Type [1]: Examination
Indicative Time on Task [2]: 8 hours
Due: **Week 7**
Weighting: **15%**

Test assessing material delivered prior to this assessment. A portion of this assessment work will be conducted during learning activities.

On successful completion you will be able to:

- Exhibit proficiency in mathematical analysis, and the application of physics, associated with fluid mechanics.
- Explain the fundamentals of static and dynamic fluid systems.
- Analyse simple static and dynamic fluid problems applied to real world problems.

Simulation Assignment

Assessment Type [1]: Case study/analysis
Indicative Time on Task [2]: 14 hours
Due: **Week 12**
Weighting: **10%**

An assignment that requires the student to perform simulations for an engineering fluid mechanics problem with relevant software and analyse the results. A portion of this assessment work will be conducted during learning activities.

On successful completion you will be able to:

- Analyse simple static and dynamic fluid problems applied to real world problems.
- Apply appropriate technology to investigate more complex fluid flow problems.

Fluid Dynamic Laboratory Reports

Assessment Type [1]: Lab report
Indicative Time on Task [2]: 8 hours
Due: **Week 13**
Weighting: **12%**

Laboratory reports written for three unique experiments demonstrating three different fluid dynamic principles. A portion of this assessment work will be conducted during learning activities.

On successful completion you will be able to:

- Explain the fundamentals of static and dynamic fluid systems.

- Analyse simple static and dynamic fluid problems applied to real world problems.

Final examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 18 hours
Due: **Exam period**
Weighting: **50%**

Final Examination assessing all material delivered throughout the unit. A portion of the preparation for this assessment task will be conducted during learning activities.

On successful completion you will be able to:

- Exhibit proficiency in mathematical analysis, and the application of physics, associated with fluid mechanics.
- Explain the fundamentals of static and dynamic fluid systems.
- Analyse simple static and dynamic fluid problems applied to real world problems.
- Apply appropriate technology to investigate more complex fluid flow problems.

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

The main text required for this course is: Potter, Wiggert and Ramadan, Mechanics of Fluids, 4th or 5th Ed.

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy

- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

The Fluid Mechanics laboratory is extended to improve the learning process. The first Virtual Realy (VR) laboratory is also established to enhance students engagement.