

## MODULE DESCRIPTION FORM

### DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

### 16587 PRESSURISED SYSTEMS

Module Registrar: Prof D Nash <a href="mailto:d.nash@strath.ac.uk">d.nash@strath.ac.uk</a>	Taught To (Course): Year 5, MSc and Exchange Students	
Other Lecturers Involved:	Credit Weighting: 10	Semester: 1
Optional class	Academic Level: 5	Suitable for Exchange: Y

#### Required prerequisites

**Note:** It is the responsibility of ALL students to ensure that they satisfy the prerequisite knowledge for this module BEFORE adding as part of curriculum selection. If unsure, please contact the Module Registrar or discuss with your Programme/Year Adviser of Studies.

Good understanding of structural and solid mechanics

- Material failure mechanisms – yield criterion
- Yielding, buckling, fracture, fatigue
- 2D stress and strain

Able to tackle differential calculus to manipulate equilibrium equations

#### Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
20	10						30	40	100

#### Educational Aim

This module aims to introduce the subject of industrial Pressurised Systems and ensure competency in the use of relevant Standards and Design Codes. Pressurised Systems are inherently dangerous since they contain stored energy which must be carefully controlled. The class aims to set down a methodology whereby a range of pressurised components (spheres, cylinders, cones, etc.) can be designed, analysed, manufactured, installed and operated to a high degree of safety.

#### Learning Outcomes

On completion of the module the student is expected to be able to:

**LO1** understand the basic philosophy behind Pressure Vessel Codes and Standards

**LO2** be able to carry out a complex design assessment and know their way around such a Standard - since they will have undertaken an industrial design exercise using the appropriate British Standard (PD 5500)

**LO3** have some ability to examine the unusual non-standard pressure vessels and the interaction between components of different stiffness configuration and understand the use of design-by-analysis and finite element assessment for complex systems

**LO4** be able to undertake thin shell and edge bending analysis and appreciate the strengths and weaknesses of thin-shell analysis and know its important role in pressure vessel code development

**LO5** be aware of the limitations of such Standards and appreciate the safety assumptions and restrictions contained therein



**Assessment Method(s) Including Percentage Breakdown and Duration of Exams (individual weightings)**

Examination				Coursework		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting
1	December	2 hours	50%	1	50%		
* LO1 - LO4				* LO2 – LO3, LO5		*	

\* **L/Os:** Indicate which Learning Outcomes (L01, L02, etc) are to be assessed by exam/coursework/practical/project as required.

**Coursework / Submissions deadlines (academic weeks):**

Design Exercise assignment to be issued in Week 5 – online submission windows will be given via MyPlace. Submitted by 3.30pm on Thursday Week11.

**Resit Assessment Procedures:**

2hr exam in August diet.

**PLEASE NOTE:**

Students must gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-assessed during the August diet. This re-assessment will consist entirely of exam. No marks from any previous attempts will be transferred to a new resit attempt.

**Recommended Reading**

**\*\*\*Purchase recommended    \*\*Highly recommended reading    \*For reference (do NOT purchase)**

**All \***

“Guide to Pressure Equipment”, by S W Earland, D H Nash & W Garden, PE Publishing

“Stresses in Shells” by W Flügge, Springer Verlag

“Pressure Vessel Design” by H H Bednar, Van Nostrand Reinhold

“Pressure Vessel Design - Principles and Concepts” by J Spence and A S Tooth, E & F Spon (in imprint of Chapman & Hall)

**Additional Student Feedback**

(Please specify details of when additional feedback will be provided)

Formal, summative feedback will be provided by the return of examination marks to students after assessment (note:- exam scripts will not be returned to students and no individual or collective discussion of exam performance will be facilitated).

Date	Time	Room No
Weekly (Tuesdays)	1400-1500	Check timetable webpages for details

Session: 2023/24

**Approved:**

**Course Director Signature:    S Connolly (on behalf of E Henderson)**

**Date of Last Modifications:    25/08/2023**

(Updated August 2023)

## MODULE TIMETABLE

**Module Code:**

**16587**

**Module Title:**

**Pressurised Systems**

**Brief Description of Assessment:**

Design Coursework – a major, structured design report with fully typed or handwritten calculations and sketches – 50% weighting -  
Exam – 2hr open book format – 50% weighting

**Assessment Timing:-**

**Please note: Timings can and will change, this should only be used as a guide.**

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Design Course work Set	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Design Course work Submit	Exam