

Design of Timber and Masonry Structures

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Module status:	Elective: H2A1, H2A2, H2U5, H201, H202
Pre- or co-requisites:	
Term:	Autumn
Contact hours:	30
ECTS units:	
FHEQ Level:	7
Assessment:	Coursework, written examination

1.0 Aims

- To introduce the students to the most basic principles of design in timber and masonry.
- To enable students to develop an understanding of the very fundamental concepts and design philosophies related to timber and masonry elements and to apply this knowledge to the design of simple conventional structural elements and assemblages.

2.0 Syllabus

This is an introductory module to the design of structures in Timber and Masonry. It is organised in two basic and distinct units.

- Design of Timber Structures:
 - Introduction to the design of timber structures. Structural properties of wood and structural design philosophy.
 - Design of complex beams.
 - Axially loaded members and design to combined bending and axial forces.
 - Design of connections.
 - Fire response and design of wooden structures.
- Design of Masonry Structures:
 - Basic components and mechanical characteristics of masonry.
 - Design of unreinforced masonry walls under gravitational and lateral loading.
 - Simplified design approach for masonry buildings.
 - Analysis of masonry arches.

No.	Topic	Staff
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01	Masonry structures and materials / Design of unreinforced masonry walls	LM
02	Vertical loading	LM
03	Horizontal in-plane loading	LM
04	Lateral out-of-plane loading	LM
05	Analysis of masonry arches	LM
06	Introduction and structural design in wood Structural use of timber and engineered timber materials	CM / (ARUP)
07	Design of timber elements	CM
08	Design of connections	CM
09	Fire response of wooden structures	CM
10	Review of past examinations and coursework clinic	CM

3.0 Intended learning outcomes

On successfully completing this course unit, students will be able to:

- Understand the basics of the structural behaviour and design of timber elements.
- Design simple structural members and conventional connections in timber.
- Understand the behaviour of unreinforced masonry structures.
- Design masonry components and bearing wall buildings.

4.0 Teaching methods

A combination of lectures and tutorials.

5.0 Assessment

Assessment by written examination and coursework.

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

S	McKenzie, W. M. C. and Zhang, B. (2007). Design of structural timber to Eurocode 5. Second Edition, Palgrave Macmillan.
S	Larsen, H.J, Enjily, V. (2009). Practical design of timber structures to Eurocode 5. Thomas Telford Publishing, London.
S	Breyer, D.E., Fridley, K.J., Cobeen, K.E., Pollock, D.G. (2007). Design of wood structures ASD/LRFD, Mc Graw Hill, NY.
S	Porteous, J. Kermani, A. (2008). Structural timber design to Eurocode 5 Wiley- Black, London.
S	Henry, A. W. (1998). Structural Masonry. Second Edition, Palgrave Macmillan.

S	Morton, J. (2007). Designers' Guide to Eurocode 6: Design of Masonry Structures. Thomas Telford Publishing, London.
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7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

Key: Primary (P), Secondary (S) and Contributory (C).

Design	Health & Safety Risk Management	Sustainability
P	C	C