Product Analysis

Module Information

2022.01, Approved

Summary Information

Module Code	5165PDE
Formal Module Title	Product Analysis
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	22
Tutorial	22

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	Provide students with knowledge and experience relating to the static stress analysis of products.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Undertake simple analytical hand-calculations to determine deflections and stresses in component(s).
MLO2	2	Undertake a finite element analysis to investigate the structural integrity of product component(s).
MLO3	3	Evaluate and rationalise calculated results to ensure accuracy

Module Content

Outline Syllabus	Simple analysis for designUse of free-body diagrams in determining loads and reactions, simple hand calculations, statics of a particle, statics of rigid bodies, load deformation of materials, concepts of stress and strain. Finite element analysis for designModelling strategy. Planning the analysis. Analysis types. Loading, point loads, stress singularities, pressure loading. Boundary conditions, use of symmetry, balanced loading and minimum constraint, avoidance of free body motion, problems associated with inappropriate boundary conditions. Choice of element, mesh controls and mesh density, convergence of results, problems with element distortion, adaptive meshing. Managing the solution, types of solver, analysis of errors and warnings. Post processing and results checking. Review of available results, stress, strain, displacement, primary and derived quantities etc. Interpretation of results, checking results, reaction forces, displaced shape, nodal and element plots, hand calculations. Design against yielding in materials and factors of safety.
Module Overview	This module will provide you with knowledge and experience relating to the static stress analysis of products.
Additional Information	This module is delivered using a variety methods including lectures, seminars, tutorials and practical sessions. The module will be delivered from a engineering and product design perspective.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	Stress analysis portfolio	100	0	MLO1, MLO2, MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Andrew Naylor	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings