DESCRIPTION OF OPTIONAL MODULES

This document provides a brief content description of optional modules to help you to select your choices. **Please note, the modules listed here are not necessarily all available on your programme.** Please refer to your Programme Specification or Module Choice Form for information about the options available to you.

New modules (2024/25 versions) will not be shown on the Module Catalogue until early August. However, you can view the previous 2023/24 versions of the Module Specifications at:
https://lucas.lboro.ac.uk/epublic/wp5016.main?dept=TT&dept2=TT

Software. Methods: Theoretical analysis. Mathematical modelling. Software based Simulation. Digital Twin based Simulation. Real Vehicle Test.

Module Title: Finite Element Methods **AERO/AUTO**	**Module Code:** 24TTC002 **Module Leader:** Dr Christopher Harvey	**Pre-requisites:** TTB204 **CW/Exam split:** 40% CW, 60% Exam

Aims:

To learn how to derive and employ finite element methods to solve stress-strain, steady-state heat flow and vibrational problems.

To implement these methods computationally using Matlab to allow for static analysis of automotive and aerospace structures

To introduce the use of the FEM commercial software, MSC Nastran and Patran.

Contents:

Direct stiffness formulation;

Standard and modified Galerkin methods;

Galerkin formulation of extension, bending and torsion 1D finite elements;

Extension of these ideas to plane and space truss analysis, and plane and space frame analysis;

Galerkin formulation of stress-strain and steady-