Module Registrar: Dr J Wood (semester1)  
Dr H Chen (semester2)  
j.wood@strath.ac.uk / haofeng.chen@strath.ac.uk

Taught To (Course): Cohorts for whom class is compulsory

Other Lecturers Involved: Prof Jim Boyle,  
Dr Zhangming Wu

Credit Weighting:  
10 (ECTS 5)

Assumed Prerequisites: Familiarity with MS Office and Windows O/S

Compulsory class

Academic Level: 1

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

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Groupwork</th>
<th>External</th>
<th>Online</th>
<th>Project</th>
<th>Assignments</th>
<th>Private Study</th>
<th>Total</th>
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<td>12</td>
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Semester 1: Introduction to engineering modelling and communication (Weeks 1-12), 1hr lecture per week for all students for first 8 weeks and 2hr lab in groups for full semester, as per timetable. Students will be expected to work through structured tutorial material during the labs and in their own time. Support will be provided in computing laboratories.

Semester 2: Lectures/laboratories/tutorials on introduction to numerical methods for engineers are all covered in a studio environment in one two hour session.

Educational Aim

This module aims to give an introduction to the use of engineering modelling and communication using the PTC Creo three dimensional modelling system and to introduce engineering tolerances and their relation to manufacturing processes. Basic numerical methods will also be introduced using MathCAD and Matlab maths & engineering software.

Learning Outcomes

On completion of the module the student is expected to:

LO1: Demonstrate a working knowledge of several software packages, specifically MathCAD and Matlab for use in engineering applications.

LO2: Have a working knowledge of the general functionality of the PTC Creo features-based parametric 3D modeller and be able to create simple part models, simple assembly models and simple drawings.

LO3: Knowledge of matrix algebra, and be able to solve systems of equations and develop mathematical models based on discrete data sets.

Syllabus

The module will teach the following:

- **Software and IT applications**: Introduction to PTC Creo and introduction to MathCAD and Matlab.

- **Engineering modelling and communication**: The role of modelling in a modern engineering environment, review of geometric modelling, introduction to features-based modelling, design intent, tolerances, part and assembly models and drawings.

- **Numerical methods**: Introduction to matrix algebra, roots of equations, linear regression analysis of experimental data.
Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1: Demonstrate a working knowledge of several software packages, specifically MathCAD and Matlab for use in engineering applications.
C2: Assignment on using MathCAD demonstrating an ability to apply MathCAD to solve representative engineering problems
C3: Assignment on using Matlab demonstrating an ability to apply Matlab to solve representative engineering problems

LO2: Have a working knowledge of the general functionality of the PTC Creo features-based parametric 3D modeller and be able to create simple part models, simple assembly models and simple drawings.
C1: Assignment using PTC Creo, demonstrating an ability to model parts and assemblies; to produce associated engineering drawings to appropriate standards and to discuss appropriate materials, methods of part manufacture and links to dimensional and geometric tolerances.

LO3: Knowledge of matrix algebra, and be able to solve systems of equations and develop mathematical models based on discrete data sets.
C1: Assignment on using MathCAD demonstrating an ability to apply MathCAD to solve representative engineering problems
C2: Assignment on using Matlab demonstrating an ability to apply Matlab to solve representative engineering problems

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: http://www.strath.ac.uk/learnteach/informationforstaff/staff/assessfeedback/12principles)

This course combines traditional lecture based learning with assisted lab based tutorials and exercises, which gives the students an opportunity to learn the software by working through weekly exercises and assignments with the help of experienced lab tutors. Students are encouraged to work in pairs to understand and solve basic engineering problems, allowing feedback both from other students and peers.

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

<table>
<thead>
<tr>
<th>Examinations/Tests</th>
<th>Courseworks</th>
<th>Projects</th>
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<tbody>
<tr>
<td>Number</td>
<td>Month</td>
<td>Duration</td>
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<tr>
<td>1</td>
<td>May</td>
<td>1 hr</td>
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<td>LO1, LO3</td>
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Coursework / Submissions deadlines:
Sem 1: 1 assignment on PTC Creo (due in December)
Sem 2: 1 assignment on MathCAD/Matlab due in March, and an 1-hr class test in May diet

Resit Assessment Procedures:
1 hour written exam during the August resit diet.

PLEASE NOTE:
Students need to gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of an exam.
Recommended Reading

****Purchase essential; ***Purchase recommended; **Highly recommended reading; *Simply for reference (do NOT purchase)


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

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Assessment of this class is by coursework submitted online or in hard copy and a class test. Students can expect to receive feedback in the form of staff comments on assessed coursework in addition to receiving the mark for each element of assessment. Students should also receive continuous formative feedback through the weekly laboratory and tutorial sessions, and should make full use of these opportunities.

Session: 2014/15

Approved:

Course Director Signature: [Signature]

Date of Last Modifications: 29 August 2014
# MODULE TIMETABLE

**Module Code:** 16165  
**Module Title:** Engineering Analysis 1

## Brief Description of Assessment:

2 assignments (A1 – A2) and 1 exam in May exam diet.

A1: Assignment on PTC Creo  
A2: Assignment on MathCAD/Matlab

## Assessment Timing:

Indicate on the table below the start/submission dates for each assignment/project and the timing of each exam/assessment(s).

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<th>WK2</th>
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<th>WK5</th>
<th>WK6</th>
<th>WK7</th>
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<th>WK10</th>
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