Module Registrar: Dr M T Stickland  
matt.stickland@strath.ac.uk

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

Other Lecturers Involved: Dr T Comlekci,  
Mr L Murphy (BAe Systems, Warton)

Credit Weighting: 10  
(ECTS 5)

Semester: 1

Assumed Prerequisites:  
16231 Flight and Spaceflight

Compulsory class

Academic Level: 3

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>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>6</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>34</td>
<td>100</td>
</tr>
</tbody>
</table>

Educational Aim

Flight and Spaceflight 2 builds on the initial work carried out in Flight and Spaceflight 1 and Aero Design 1 and is intended to develop the student’s knowledge through the application of mathematical modelling of an aircraft’s stability, control and performance in the design of a small scale UAV.

The equations of motion of an aircraft are developed as part of a two day short course on flight simulation given jointly by University staff and a simulation engineer from BAE SYSTEMS, Warton. This short course introduces the mathematics of flight simulation and the technology involved in flight simulator hardware and software. The course content is not examined but attendance is mandatory for the award of a credit for this class.

The design of a UAV for participation in the BMFA “University Challenge” is commenced.

Learning Outcomes

On completion of this class the student should have a sound technical grasp of:

LO1 aircraft design process from concept to first flight

LO2 the fundamentals of flight simulation.

Syllabus

1. Longitudinal stability and control
2. Flight simulation
3. BMFA design project

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 undertake the design of a small scale remote control aircraft. The student should be able to:
C1 undertake the design of a scale remote control aircraft from the issue of the specification, through the basic design, detailed design up to the final manufacture

LO2 the fundamentals of flight simulation. The student should be able to:
C1 describe the fundamentals of a flight simulation system
C2 solve the equations of motion for flight simulation using a computational mathematical program such as Mathcad

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: [www.strath.ac.uk/learnteach/informationforstaff/staff/assessfeedback/12principles/](http://www.strath.ac.uk/learnteach/informationforstaff/staff/assessfeedback/12principles/))

Assessment will be carried out through a laboratory and project reporting according to the following:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer mark</td>
<td>10%</td>
</tr>
<tr>
<td>Tech report progress</td>
<td>10%</td>
</tr>
<tr>
<td>Report on BMFA design</td>
<td>60%</td>
</tr>
<tr>
<td>Presentations</td>
<td>10%</td>
</tr>
<tr>
<td>Flight Test Course report</td>
<td>10%</td>
</tr>
</tbody>
</table>

Feedback will be provided throughout the semester by:

- Comments on the completed tech report
- Comments on the individual FTC report
- Informal discussion about the group’s aircraft’s design
- Constructive criticism of the group presentations.
- Comments on the technical content and presentation of the group’s final report

NB: A peer mark will be taken during the BMFA design project and a student with a peer mark below 50% will be given an individual oral exam to assess why they are not contributing to the project. If a student does not contribute to the progress of the group the student will not be able to take part in the BMFA design in 16309 and an individual project will be assigned for the 16309 Aero-Design 2 class.

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

<table>
<thead>
<tr>
<th></th>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td></td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td>Month(s)</td>
<td></td>
<td>Weighting</td>
<td>Weighting</td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 | 40%       | 1 | 60% |

L/Outcomes

**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 by early August. This re-examination will consist of carrying out additional work as agreed with Class Registrar or resubmission of laboratory and/or flight test course reports.

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)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room No</th>
</tr>
</thead>
</table>

Session: 2014/15

Approved:

Course Director Signature: [Signature]

Date of Last Modifications: 12 August 2014
### Module Timetable

**Module Code:** 16351  
**Module Title:** Flight and Spaceflight 2

**Brief Description of Assessment:**

- Peer mark 10%
- Tech report progress 10%
- Report on BMFA design 60%
- Presentations 10%
- Flight Test Course report 10%

**Assessment Timing:**

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

<table>
<thead>
<tr>
<th>Semester</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
<th>WK5</th>
<th>WK6</th>
<th>WK7</th>
<th>WK8</th>
<th>WK9</th>
<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
<th>Exam Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FTC report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Presentation BMFA report</td>
</tr>
<tr>
<td>Two</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Exam Period</td>
</tr>
</tbody>
</table>