

## Liverpool John Moores University

Title: Aircraft Systems Design B  
Status: Definitive  
Code: **7102UAS** (126086)  
Version Start Date: 01-08-2019

Owning School/Faculty: Maritime and Mechanical Engineering  
Teaching School/Faculty: Maritime and Mechanical Engineering

| Team                 | Leader |
|----------------------|--------|
| Linghai Lu           | Y      |
| Mohamed Kara-Mohamed |        |

**Academic Level:** FHEQ7      **Credit Value:** 20      **Total Delivered Hours:** 33  
**Total Learning Hours:** 200      **Private Study:** 167

### Delivery Options

Course typically offered: Semester 2

| Component | Contact Hours |
|-----------|---------------|
| Lecture   | 22            |
| Practical | 3             |
| Tutorial  | 8             |

**Grading Basis:** 50 %

### Assessment Details

| Category  | Short Description | Description   | Weighting (%) | Exam Duration |
|-----------|-------------------|---|---------------|---------------|
| Report    | AS1               | Design proposal for a chosen type of UAV based on performance requirement | 30            |               |
| Portfolio | AS2               | Design portfolio for the chosen type of UAV in the proposal               | 70            |               |

### Aims

*This module aims to provide advanced level knowledge for pre-concept design and conceptual design of a UAV, to to develop capability and skills in system integration and design of UAV's.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate effective team-working in UAV development
- 2 Calculate vehicle's advanced performance and aerodynamic capabilities
- 3 Apply rigorous approach to analysis, test and demonstration
- 4 Specify and choose suitable flight and payload components and sub-systems to design a UAV for a particular application.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

|                        |   |   |   |   |
|------------------------|---|---|---|---|
| Design proposal        | 1 | 2 | 3 |   |
| Final design portfolio | 1 | 2 | 3 | 4 |

## Outline Syllabus

- *Aircraft Weight, Size, Geometry, and Performance.*
- *Payload integration.*
- *UAV Reliability, Maintainability, Supportability, and Safety.*
- *Life Cycle Cost, UAV System Development and Integration.*
- *Launch and Recovery, UAV Ground Test and Flight Test.*
- *Certification.*

## Learning Activities

This is a project-based module which will be steered by means of lectures and practical sessions. These will provide basic insights into the UAV design process and guide independent research. Students will be organised into teams and mentored on issues of personal effectiveness, team-working and communication. Design work of one UAV type will be allocated to each team according to a managed work plan that they will be advised on how to create and maintain. The end-result will be a detailed functional simulation model of a flying UAV.

## Notes

This module (B) continues the introduction of Module (A). The contents of UAV Control and Stability will be more generic compared with those corresponding in the Module - Flight Dynamics and Control.