

**Summary Information**

<b>Module Code</b>	5571NCCG
<b>Formal Module Title</b>	Green Aviation
<b>Owning School</b>	Civil Engineering and Built Environment
<b>Career</b>	Undergraduate
<b>Credits</b>	20
<b>Academic level</b>	FHEQ Level 5
<b>Grading Schema</b>	40

**Module Contacts****Module Leader**

<b>Contact Name</b>	<b>Applies to all offerings</b>	<b>Offerings</b>
Graham Sherwood	Yes	N/A

**Module Team Member**

<b>Contact Name</b>	<b>Applies to all offerings</b>	<b>Offerings</b>
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**Partner Module Team**

<b>Contact Name</b>	<b>Applies to all offerings</b>	<b>Offerings</b>
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**Teaching Responsibility**

<b>LJMU Schools involved in Delivery</b>
LJMU Partner Taught

## Partner Teaching Institution

Institution Name
Nelson and Colne College Group

## Learning Methods

Learning Method Type	Hours
Lecture	48

## Module Offering(s)

Offering Code	Location	Start Month	Duration
SEP-PAR	PAR	September	28 Weeks

## Aims and Outcomes

<b>Aims</b>	The main aim of this specialist module is to provide students with theoretical and technological knowledge and practical understanding for reducing environmental impact of current aviation practice. Students will learn improving aircraft fuel efficiency, developing the next generation of efficient air traffic control and developing new technologies and operations to reach the future of carbon-neutral air transportation across the globe. The module will comprehensively cover the relevant issues and emerging areas in green aviation including environmental impacts (including carbon footprint and noise emissions), technology advances, public policy and economics, that are intricately linked to the pace of development that will be realized in the coming years.
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## Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Demonstrate ability to design and develop green aviation products and operations.
MLO2	Evaluate and apply sustainable and greener solutions to current aviation practice.
MLO3	Undertake an analysis of decarbonisation and sustainability in an aircraft.
MLO4	Demonstrate understanding of practical decarbonisation measures (including economics, societal and regulatory policies) and strategies for smart air transportation supporting global net-zero agenda.
MLO5	Communicate analysed solutions clearly (associated with aviation case studies) in written and verbal form to specialist and non-specialist audiences.

## Module Content

### Outline Syllabus

• New aircraft and engine technologies including green aircraft design concepts (e.g., reduced drag airframes), manufacturing technologies, and propulsion advancements. • Nature inspired (biomimetics) green air mobility solutions. • Smart flight operations and airspace management. • Airspace modernization engineering. • Sustainable and alternative aviation fuels (including recycled fuels and those originating from renewable sources for clean combustion and emission control of noise, exhaust gases and particulates). • Advanced sustainable materials and light-weight composites for aviation. • Carbon capture and storage in an aircraft. • Sustainable aviation decarbonisation: carbon reductions through effective market-based policy measures. • Economics, societal impacts and regulatory policies for green aviation. • Case studies: Sustainability in aircrafts (e.g., Boeing 787, Airbus A320neo, A350 or the latest ones etc.)

### Module Overview

### Additional Information

### Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Report	Case Study Report	60	0	MLO2, MLO1, MLO3
Presentation	Presentation	40	0	MLO4, MLO5