

Air Transport

Emissions from aviation are a significant contributor to climate change. Aeroplanes burn fossil fuel which not only releases CO₂ emissions but also has strong warming non-CO₂ effects due to nitrogen oxides (NO_x), vapour trails and cloud formation triggered by the altitude at which aircraft operate. These non-CO₂ effects contribute twice as much to global warming as aircraft CO₂ and were responsible for two-thirds of aviation's climate impact in 2018. Emissions from aviation are growing faster than any other mode of transport.

Period:	Period 3
Course coordinator:	Prof. David Sanchez - University of Seville - email: ds@us.es
Lecturer:	To be decided
Educational management portal:	moodle.unitus.it
Objectives:	<p>Familiarise the students with the main characteristics of the contemporary aircraft: capacity, engine technology, fuels</p> <p>Provide an insight into more sustainable aircraft: SAFs, hydrogen and electric aircraft</p> <p>Provide a holistic view of how current land infrastructures and aircraft concepts would have to change to enable more sustainable aviation</p>
Programme:	<ul style="list-style-type: none"> ● Introduction: carbon footprint of aviation today vs. heavy transport ● Contemporary aircraft technology: short-haul vs. long-haul. Legislation ● Sustainable Aviation Fuels: role, production and impact on carbon footprint: electric vehicle, hydrogen car, biofuels ● Hydrogen aircraft: concepts, impact on aircraft specifications of biofuels ● More electric aircraft: concepts, impact on aircraft specifications
Pre-requisites:	Fundamentals of Thermodynamics, in particular energy conversion systems for power generation.
Study material:	<ul style="list-style-type: none"> ● Lecture slides; ● Reading material; ● Additional literature handed out during the course / made available via Blackboard.