

AVIA H4601: Flight Mechanics

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AVIA H4601: Flight **Mechanics**

Module Content & Assessment

Indicative Content

The ISA

• relative density, pressure and temperature • the equation of state • the hydrostatic equation • Mach number, equivalent airspeed, calibrated airspeed, true airspeed.

Weight Performance

· aircraft mass estimation · wing loading · range and endurance calculations.

Drag

• maximum lift to drag ratio • minimum drag and minimum power airspeeds • plot the Drag Polar (Appendix 2 to CS23).

• general engine performance • determine fuel flows and specific fuel values • derive and calculate the propulsive efficiency • understand thrust and power characteristics.

Performance

• aircraft ceiling • important airspeeds • limiting factors on flight envelopes (CS23.333) • corner velocities • accelerated stall lines • structural limits • cruise performance • specific range and endurance • take-off distance (CS23.59) • landing distance (CS23.75).

Manoeuvres

• stall speed (CS23.39) • speed stability • load factor • max load factor in a turn (V-N Diagram) (CS23.337) • climbing flight • turning performance • gliding performance.

Mathematical Modelling

mathematical modelling • simulation • performance prediction • performance analysis.

Flight Testing

• flight testing in a simulator • flight testing in a real live aircraft • flight test planning • test data capture • performance prediction.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

Continuous Assessment				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	Students will be expected to sit one or more individual written assessments throughout the academic year, typically at the conclusion of one or more learning outcomes.	1,2,3	10.00	Week 7

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Students will carry out a number of laboratory sessions throughout the academic year to enhance their understanding of the module, and will produce written reports describing each one. Laboratory practical work will include investigation of the following topics: flight performance estimation and analysis; computer simulation tools and mathematical modelling; real time flight analysis. It is envisaged that a number of these laboratory sessions will take place in both a simulated and a live aircraft flight environment.	1,2,3,4	30.00	Every Second Week

End of Module Formal Examination					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Formal Exam	Students will sit a formal written examination at the end of the semester.	1,2,3	60.00	End-of- Semester	

SETU Carlow Campus reserves the right to alter the nature and timings of assessment



AVIA H4601: Flight Mechanics

Module Workload

Workload: Full Time		
Workload Type	Frequency	Average Weekly Learner Workload
Lecture	12 Weeks per Stage	2.00
Laboratory	12 Weeks per Stage	2.00
Independent Learning Time	15 Weeks per Stage	5.13
	Total Hours	125.00

Module Delivered In					
Programme Code	Programme	Semester	Delivery		
CW_EEAER_B	Bachelor of Engineering (Honours) in Aerospace Engineering	7	Mandatory		