



Technische
Universität
Braunschweig



TU BRAUNSCHWEIG
summer school



Summer School 2025

International Summer School
Advanced Sustainable Aviation Technologies

Key facts

Time period	01–12 September 2025
Registration deadline	15 August 2025
Event form	Online (01–05 September) and on site (08–12 September)
Participation fee	Free of charge
Language of instruction	English (on the level B2/C1)
Workload	90 hours, divided into virtual and on-site phases
Credits	3 ECTS credits
Certificate	Graded certificate
Target group	Master students of any discipline with a strong interest in sustainable aviation technologies

Any questions?

Please do not hesitate to contact us, we are happy to help!

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Exemplary course overview

Please note that this is an exemplary course overview. The actual programme may differ.

	Online part					On-site part at TU Braunschweig					
	Mon, 01 Sep	Tue, 02 Sep	Wed, 03 Sep	Thu, 04 Sep	Fri, 05 Sep	Mon, 08 Sep	Tue, 09 Sep	Wed, 10 Sep	Thu, 11 Sep	Fri, 12 Sep	
08:30–10:00		Materials and Structures	Emissions and climate aspects	Operational Considerations for Aircraft Engine MRO	Lifecycle Assessment (Herrmann)	Welcome	Electrical Systems	tba	Group work with expert consultants	Project Presentation (Group 1)	
10:00–10:30	Coffee Break					Coffee Break					
10:30–12:00	Introduction	Advanced Systems Engineering	Combustion Fundamentals for Sustainable Aviation	Noise Prediction and Assesment	Power Electronics for Aviation	Group Work with Expert Consultants				Project Presentation (Group 2)	
12:00–13:00	Lunch Break					Lunch Break					
13:00–14:30	Aircraft Aerodynamics	Airline Operations Research	Combustion Emissions	Sustainable Air Traffic Management	Overall Aircraft Requirements (Reckzeh)	Group Work with Expert Consultants	Visit to Hannover Airport	Group Work with Expert Consultants		Project Presentation (Group 3)	
14:30–14:45	Coffee Break					Coffee Break		Coffee Break			
14:45–16:15	Energy Supply - Batteries	Improving aircraft performance through flow control	Flight Control	Fuel cells for Aviation	Online Quiz	Braunschweig City Tour		Aerospace Lab Tour - TU Braunschweig: IFAS, ISM, IFL	Group Work with Expert Consultants	Closing Ceremony	
16:15–16:45	Break									Break	
16:45–18:15	Virtual Campfire									Barbecue	

Modules and projects

Lecture modules (online preparation phase and on-site morning sessions)	<ul style="list-style-type: none">» Advanced Aircraft Performance/Design» Advanced Propulsion Systems (BLI, UBHR, Open Rotor, Distributed Propulsion)» Air Traffic Management & Operations Research» Advanced Design Methods (MDO, Digital Twin)» Future Aviation Fuels and Energy Carrier – Advantages, Disadvantages and Risks» “The Airline Perspective” (Fleet Planning and Operation)» Other Disciplines (e.g. Life-Cycle Assessment, Climate Modelling)
Project work (defining problems with industry partners)	<ul style="list-style-type: none">» Definition of Top-Level Requirements and Basic Mission Description for a Future “Low-Emission-Aircraft”» First Preliminary Design of Aircraft» First Preliminary Design of Propulsion System» Assessment and Discussion of Pros and Cons» Aspects of Integration into the Global Aviation Systems
Project ideas (4–5 students per group estimated)	<ul style="list-style-type: none">» Sustainable Aviation Solutions for Reg./Short Range» Sustainable Aviation Solutions for Medium Range» Sustainable Aviation Solutions for Long Range

The world is facing an enormous challenge in transferring aviation into a more sustainable and greener transport mode.

In the long run, sustainable and emission-free flights over the entire aviation sector from short range to long range operation are the current priority and require enormous research and

development activities which can by no means be limited to classical aerospace disciplines. Instead, they require new interdisciplinary approaches, methods and teams covering all aspects from aerospace, from materials to structures, from energy to propulsion as well as aircraft design, electrical engineering and even economic and social sciences.

Of course, this all starts with an up to date insight in the most current state of the art in aviation. In our Summer School course, you can acquire both theoretical knowledge and practical project experience in the field

to address these grand challenges, and to connect with fellow students from different countries.

The programme is divided into two parts: The basic knowledge about methods and technologies will be given in lectures held by professors from TU Braunschweig and our partner universities as well as from aviation industry experts during the virtual phase. Afterwards, you will put your knowledge into practice. The on-site phase will consist of additional lectures in Braunschweig to gain specific insights and well as a hands-on

project that will be conducted in international and interdisciplinary teams, supervised by professors. The Summer School will be complemented by a rich social programme: There will already be some joint online evening events to exchange ideas during the online phase. During the on-site phase, participants will spend the afternoons taking part in activities in Braunschweig. You will get to know the city, the university's research airport as well as one of TU Braunschweig's research facilities. You will also have enough time to explore the city on your own and to get to know your fellow students.



Photos: Kristina Rottig/TU Braunschweig



Photos: Sebastian Olschewski/TU Braunschweig; Walter Bergmoser/TU Braunschweig

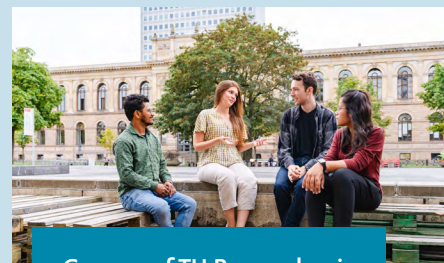
Impressions of our Summer Schools



Visits to institutes



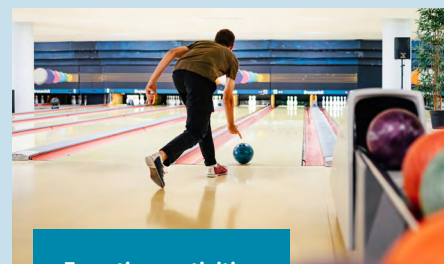
Braunschweig's historic centre



Campus of TU Braunschweig



Botanical Garden



Free-time activities



Research Airport

Application

Please apply until 15 August 2025. Registration may be closed before the deadline in case the maximum of participants is reached.

Please use the application form that you can find on our website:

→ www.tu-braunschweig.de/summer-school

After filling out the form, please send it to us via email:

✉ summerschool@tu-braunschweig.de



Photo:
Stephan Nachtigall/TU Braunschweig