SEMINARS INVITED PROFESSORS

CALENDAR – TIMETABLE

SEMINARS - INVITED PROFESSORS

Classes Dr. Bruno Castanié
Classes Dr. Michael May

	Monday 2th March 2020	**Tuesday** 3th March 2020	**Wednesday** 4th March 2020	**Thursday** 5th March 2020	**Friday** 6th March 2020	**Saturday** 7th March 2020
8:00						
9:00						
10:00					Lecture 5 - B. Castanié	
11:00	Lecture 1 - B. Castanié	Lecture 2 - B. Castanié	Lecture 3 - B. Castanié	Lecture 4 - B. Castanié	Room: II-02A	
12:00	Room: II-01A	Room: II-01A	Room: III-03	Room: II-01A	Lecture 5 - M. May	
13:00					Room: II-02A	
14:00						
15:00	Lecture 1 - M. May	Lecture 2 - M. May	Lecture 3 - M. May	Lecture 4 - M. May	Seminars on mechanics of materials and	
16:00	Room: II-04B	Room: II-04B	Room: II-04B	Room: II-04B	I-16i	
17:00					Seminars on mechanics of materials and	
18:00					I-16i	
19:00						
20:00						
21:00						

DR. MICHAEL MAY

Head of Department Materials and Simulation Methods
Fraunhofer-Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI

https://www.emi.fraunhofer.de/en.html

Session 1: Dynamic material behaviour (2 hours)

- Relevance of dynamic material behavior
- Characteristic phenomena: Strain rates and shock waves
- Decomposition of the stress tensor
- Strain-rate dependent material properties

Session 2: Dynamic material testing I (2 hours)

- Limitations of standard test equipment
- Wave theory
- Conditions for valid tests
- Types of Dynamic material tests
- Instrumentation and diagnostics

Session 3: Dynamic material testing II (2 hours)

- Application to Adhesives
- Application to Composites
- Application to Metals
- Application to Concrete

Session 4: Basics in Shock Wave Physics (2 hours)

- The Riemann Problem
- Non-linear equation of state
- Flyer-Plate experiments
- Taylor Anvil experiment

Session 5: Modeling of materials under high loading rates (2 hours)

- Explicit FE modeling
- Material models capturing rate effects
- Cohesive zone modeling for composites and adhesive joints

DR. BRUNO CASTANIÉ

Head of Composite Group, Institut Clément Ader, University of Toulouse
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Full professor at "Institut National des Sciences Appliquées de Toulouse (INSA) – Universitat de Toulouse"
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Session 1: Understanding composite structures behavior (2 hours)

The example of Compression failure, Structure effects, Tests and Analysis of composite structures, Multi-level analysis, Damages modes. Example of failure scenario: FHC Tests and offset failure, pull-through, low velocity/low energy impact, Conclusions.

Session 2: Sizing philosophy in aeronautic (2 hours)

Failure Criteria, Allowables and Knockdown factors, tests on coupons, point-stress, Pyramid of tests, damage tolerance and advanced modeling strategies.

Session 3: Sandwich structures for aeronautics (2 hours)

Sandwich, stiffened and geodesic aeronautic composite structures: a comparison. Manufacturing issues, mechanical behavior, Sizing and certification constraints of sandwich structures. History of aeronautic applications.

Session 4: Technology (2 hours)

Short recall of main matrix and fibers, Manufacturing methods in and out-of-autoclave, Automated process, defects, dust, stiffened panels, Integrated design, 2D1/2 and 3D composites, fibre steering, hybrid structures.

Session 5: History of aeronautic composite structures (2 hours)

V10F, Helicopters, Civil Aircraft, Space, state-of-the art, disclosed programs and possible futures.