Course code: ENPC05
Course title: Vehicular Crashworthiness
Institution: Ecole des Ponts ParisTech
Course address: 6/8 av. Blaise Pascal, Cité Descartes, Champs-sur-Marne, 77455 Marne-la-Vallée
City: Paris
Minimum year of study: 4th year
Minimum level of English: Good
Minimum level of French: None
Key words: Crashworthiness (passenger cars, trucks and buses, aircrafts, trains), structures and materials for energy absorption, numerical simulation for crash, biomechanical aspects
Language: English
Professor responsible: Prof. Dr. Fabian Duddeck
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Participating professors: None
Number of places: Minimum: 5, Maximum: 30, Reserved for local students: 0
Objectives: Objective is to understand current design methods for vehicular crashworthiness in an industrial context. The course concentrates on automotive crashworthiness but aspects from truck/bus/train and aircraft crashworthiness are included.
Programme to be followed: History of safety for car body design; safety in current product development processes; car body structures; general crashworthiness; regulations and test procedures; belts and airbags; dummies and human models; car-to-car compatibility; pedestrian protection; numerical simulations (Finite Element Methods, meshless methods, optimization); materials and manufacturing; new vehicle concepts.
Five days of lectures, problem solving sessions, group work.
Homework
Half-day visit to a crash test area or similar.
Prerequisites: Introductory courses in Numerical Methods in Engineering (ideally finite elements), Structural Mechanics, Material Modelling.
Course exam: Final written test (1 hour).