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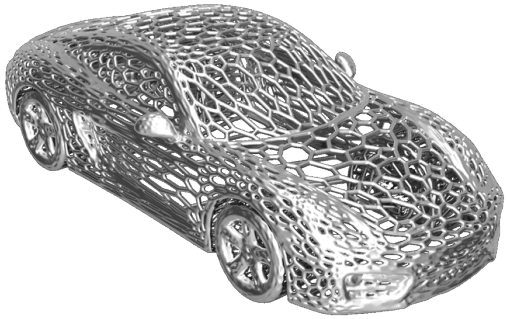
MINOR
MATERIALS FOR THE DESIGN OF THE FUTURE



The aircraft and automotive industries are among the leading industries for new developments in terms of innovative materials and technologies, and many of them are based on polymers.
This minor combines both aspects: it is about the development of innovative materials in combination with special technological functionalities.

WHAT IS A HTHT MINOR?

A HTHT-minor fits within the UT profile: High Tech, Human Touch. The minor is offered in English and accessible for both national and international students. The goal of the HTHT-minor is to illuminate specific societal themes for which the UT develops High Tech Human Touch solutions. These solutions are created by conducting high-quality research. Both the form and the content of the minors are High Tech Human Touch (multidisciplinary) and are profiling for the student.

The UT offers most HTHT-minors in a coherent package of 2 (30 EC). There are also HTHT minors of 15 EC that do not belong to a package. You can choose one of these minors and combine this with one minor of a package. If possible, you can even choose 2 minors from different packages.

In this module, the students will learn

1. How the combination of different materials creates new functionalities,

2. How the nature of a material determines the structure of the interface,

3. How the interface structure determines the properties of the composite,

4. How macroscopic as well as microscopic characteristics of materials are related to their property profiles,

5. How versatile polymers are in terms of properties and applications.

6. How to improve the sustainability of polymeric materials, and how to recycle them.

UNIVERSITY OF TWENTE.

MINOR OVERVIEW

Part 1: Course Advanced and Innovative Material Science	Part 2: Project Materials for the Design of the Future	Part 3: Course Heading towards a Sustainable Future
Group assignment 30%	Assignment 30%	Group assignment 30%
Written exam 70%	Report 35%	Written exam 70%
	Presentation 35%	
5 EC	5 EC	5 EC

MATERIAL TECHNOLOGY

In the course Advanced and Innovative Material Science (AIMS), different aspects of materials will be introduced. The course contains three main directions. First, lectures about materials in general will be given with a focus on polymers. Secondly, the interaction mechanisms and interfaces between materials will be discussed. Lastly, the focus lies on materials used in advanced and innovative applications, such as self-healing and other SMART materials.

DESIGN PROCESS

During the project, students combine their gained knowledge of the two courses to create, evaluate and improve their own polymeric materials. The design process consists of working in teams. The process will be presented and discussed with peers on a regular base.

A SUSTAINABLE FUTURE

The newly developed course “Heading towards a sustainable future (HTSF)” deals with recent challenges and solutions to improve the sustainability of modern materials, in specific polymers. Four main topics will be covered within this course:

1. National and International policies with regards to sustainability and recycling of polymers, recycling streams, circular economy, REACH legislations and life cycle analysis (LCA)
2. Recycling of plastics, elastomers and composite materials incl. microplastic challenges and solutions
3. New biobased solutions with regards to biomasses, monomers, polymers and additives
4. Recent trends of the industry incl. guest lectures from companies

MORE INFORMATION

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For more information about this minor and for general information about minors:
www.utwente.nl/minor