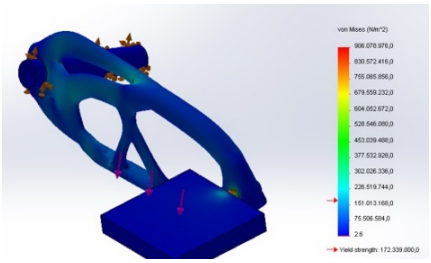
Minor Smart Product Development with Additive Manufacturing (SPDAM)

In-depth technical minor on Additive Manufacturing (AM) also known as 3D-printing. The entry requirements are based on a technical bachelor study, such as Mechanical engineering, Mechatronics, Automotive, Applied Physics, or a comparable study.
English study materials, and in case of participating international students the lectures will also be in English.

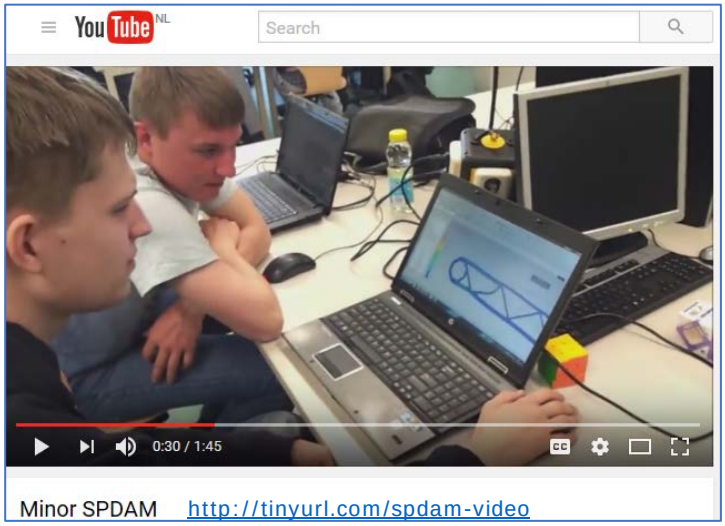
- Capabilities and limitations of AM-machines, and how to help implementing this technology in a company (sector high tech systems, medical, or general).
- Functional design in the field of mechanical, thermal and flow. Material selection and production technologies.
  Use of professional software packages.
- Operate AM-machines, materials science tests on AM-products, and occupational health and safety issues in laboratories.



The educational program consists of 5 modules en 1 project.

- 2 modules theory (DFAM, PM11)
- 1 module practical skills (PSAM)
- 2 modules computer lab (CM11, EP11)

Each module has 2 contact hours per week. The project is scheduled for whole day, including 1 hour tutor consultation.



Minor SPDAM http://tinyurl.com/spdam-video

Program	Contents
DFAM Module Theory (4 EC)	**Design for Additive Manufacturing** Quarter 1: Design rules, economic aspects, case study. Quarter 2: Killer application identification (project).
PSAM Module Practicals (4 EC)	**Practical Skills for Additive Manufacturing** Hands-on experience in the lab with AM-equipment, reverse engineering, production preparation, post processing, testing materials and printed parts, utilizing specialized software (e.g. Materialise Magics), occupational health and safety issues.
PM11 Module Theory (4 EC)	**Production technology and Materials** Polymers, metals, ceramics. Properties of materials for AM, Heat treatment, testing of materials. Conventional (lathes, milling, welding) versus additive processing, different types of AM-machines, support structures. Printability for jetting. Indirect printing.
CM11 Module Computer lab (4 EC)	**Stress analysis and Optimization** Theoretical background and practical skills in finite element method. Modelling, analyzing, and optimizing mechanical stress by topology optimization in a product using professional software (Siemens NX, Altair Inspire).
EP11 Module Computer lab (4 EC)	**Heat and Flow analysis** Principles of heat and flow transfer. Theoretical background and practical skills in finite element method. Modelling and analyzing heat and/or flow, e.g. in a heat exchanger or injection mold, using professional software (Siemens NX).
IPDAM Project (10 EC)	**Project Integrated Product Development with AM** Project assignment from different companies (high tech systems, medical, or general), which involves analyzing, (re)designing, building and testing a product in which AM can deliver a superior solution. Each project group consists of 6 students, a company tutor and a school tutor. Project management, technical content, research skills, personal development (work, plans, critical, constructive behavior), Report writing and presentation skills.

The minor runs in the spring semester (Feb-Jul) and includes 30 ECTS credits, meaning a study load of 840 hours, divided over 20 educational weeks, of 40 hours per week.
Location: Fontys University of Applied Sciences, School of Engineering, Rachelsmolen 1, 5612 MA Eindhoven, 08850-77333.
Enrollment: Fontys students ProgRESS and for external students KiesOpMaat

Contact and coordination
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