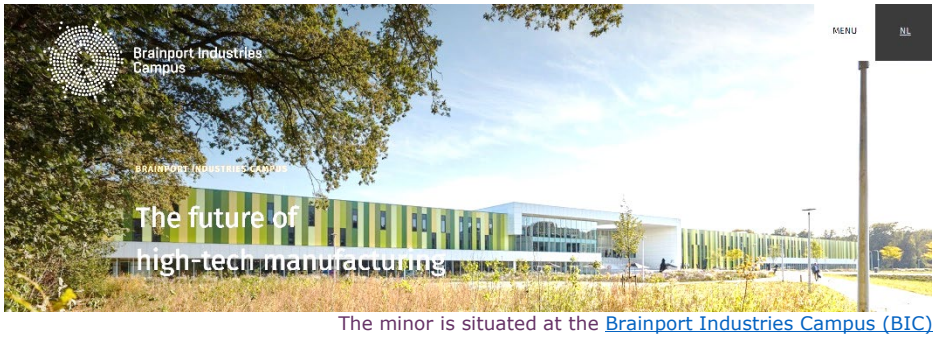
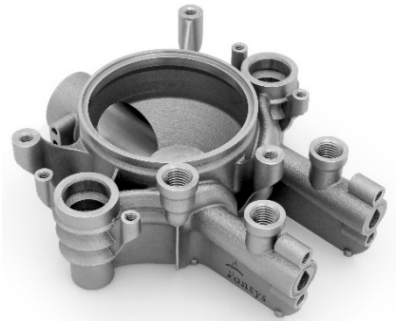
Minor Smart Product Development with Additive Manufacturing (SPDAM)

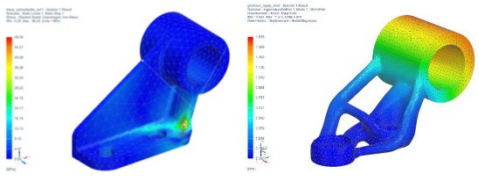


The minor is situated at the Brainport Industries Campus (BIC)

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 comparable study.

English study materials, and in case of participating international students the lectures will also be in English.

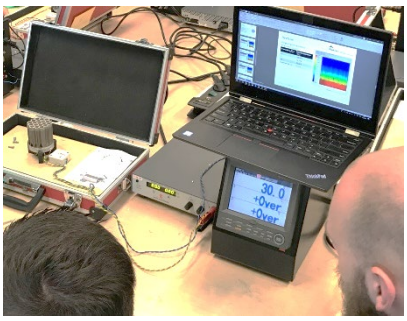




- Capabilities and limitations of AM-machines, and how to help implementing this technology in a company (sector high tech systems, medical, or general).
- Functional design in the field of mechanical, thermal and flow. Material selection and production technologies. Use of professional software packages.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

The 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 42 hours per week. Contact time is 13 hours a week.

- Lessons at the BIC are scheduled, if possible, on whole days.
- Project is scheduled on one whole day a week.
- 3 written exams (DFAM1, PM11T1, PM11T2), for the rest there are practical assignments and projects.
- Study materials are presentations, articles, lecture notes, hand-outs, etc. No mandatory books.



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, test and measurement of materials and printed parts, utilizing specialized software, occupational health, and safety issues.
PM11 Module Theory (4 EC)	**Production technology and Materials** Properties of materials (polymers, metals, ceramics) for AM, heat treatment, testing of materials. Conventional (lathes, milling, welding) versus additive processing, different types of AM-machines, support structures. Printability and 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).
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). You will design, print, and test your own models.
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 4 students, a company tutor, and a school tutor. Project management, technical content, research skills, personal development, report writing and presentation skills.

Limitation: Min–Max = 12–32 students
Contact and coordination: Auke Visser, 08850-85844, auke.visser@fontys.nl
Enrollment Fontys students ProgRESS and for external students KiesOpMaat
Fontys University of Applied Sciences, School of Engineering, De Rondom 1, 5612 AP Eindhoven, 08850-77333, engineeringeindhoven@fontys.nl