Digital Fabrication (minor)

Basic information of the minor

**Code:** ARTS3061  
**Extent:** 18-24 ECTS  
**Language:** English  
**Organizing department:** Department of Art and Media  
**Teacher in charge:** Matti Niinimäki  
**Administrative contact:** Erika Syväniemi  
**Level of the Minor:** BA 3rd year, MA 2nd year  
**Target group:** All Aalto students. Specifically targeted to students from ARTS, SCI, ELEC. Students outside Aalto University via Lifewide Learning.

**Quotas and restrictions:** Due to the hands-on nature of the courses, student number is very limited and students need to apply for the minor.

- 4 seats are reserved for New Media MA students as part of their alternative studies.
- 4 seats are reserved for students in Aalto university (students from the Master’s Programme in Information Networks have priority)
- 4 seats are reserved for students outside the university (Lifewide Learning)

**Application period:** Autumn semester. The application process should be completed one week before the enrolment to the courses for the spring semester begin.

**Application procedure:** Students should provide the following documents when applying:
- Transcript of records of their completed studies
- Motivation letter explaining their level of prior experience in digital fabrication and electronics as well as their motivation to take part in the minor.

**Application instructions for Aalto University students**

Students from other Finnish universities apply for the minor during the JOO application period. Instructions: [Instructions for JOO applicants from other Finnish universities](#).

Content and structure of the minor

**Content**

The minor is based on the global Fab Academy program ([http://fabacademy.org/](http://fabacademy.org/)), a fast paced, hands-on learning experience where students learn rapid-prototyping by planning and executing a new project each week, resulting in a personal portfolio of technical accomplishments. The minor teaches students to envision, design and prototype projects using digital fabrication tools and machines. It is a multi-disciplinary and hands-on learning experience that empowers students to learn-by-doing and inspires them to make things locally to become active participants in sustainable cities and communities.

The Fab Academy program was developed to teach hands-on skills in fab labs, which began as an outreach project from MIT’s Center for Bits and Atoms, and has grown into a global network of more than 500 labs. Fab Academy instruction is based on MIT’s popular rapid-prototyping course How To Make (almost) Anything. The teaching of the minor consists of weekly global lectures from Prof. Neil Gershenfeld and the Fab Academy team, local lectures at Aalto Fab Lab, weekly assignments, and independent work at the lab.

Please note that Aalto students are not expected or required to register to the the paid Fab Academy program in order to participate in these courses. However, students who wish to also apply and enroll to the Fab Academy program are able to receive ECTS credits through the courses offered by the Digital Fabrication minor.

The minor is a collaboration between the MA Programme in Art & Media – New Media major (ARTS), Information Networks MA Programme (SCI), and Aalto Fab Lab.

Minor’s intended learning outcomes

On successful completion of the minor, the student will be able to:

1. Design, develop, and produce tangible interactive objects using computer-aided design (CAD) and computer-controlled machining (CAM) tools and techniques.
2. Independently operate various digital fabrication tools, such as 3D printers, 3D scanners, laser cutters, and milling machines.
3. Select and apply appropriate additive and subtractive techniques to fabricate their prototypes, products, artworks, and other tangible objects.
4. Apply and demonstrate competence in design, fabrication, and programming of their own printed circuit boards (PCBs) populated with microcontrollers as well as input and output devices.
5. Apply project-management techniques to plan out and implement their projects.
6. Summarise and communicate their project process and outcomes using website development tools.

7. Critically examine and evaluate the values and promises of the maker movement and digital fabrication technologies.

Structure of the minor

The minor consists of three courses spanning periods III to V. The individual courses should be considered as a continuous learning experience that build on top of each other.

- Digital Fabrication I, 6 ECTS (Period III)
- Digital Fabrication II, 6 ECTS (Period IV)
- Digital Fabrication Studio, 6-12 ECTS (Period V, the varying credit amount depends on the scope of the final project the student creates)

The course structure is tied to the global Fab Academy structure and our international partners. Therefore, the exact topics covered in each of the courses are subject to change based on updates in the schedule of the global program.

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