

# Free Minor Mechanical Design - Mechanical Engineering

Delft University of Technology | Formula Student Team Delft

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## Introduction

Since 2011 Formula Student Team Delft has been building an electric powered race car. A large amount of the parts found in the car are conceived through "traditional" mechanical design, with varying degrees of difficulty. Designing these parts often finds the students reverting to knowledge gained during the bachelors study of mechanical engineering.

A few examples of these parts are the transmission or brake system of the car. To make sure these parts don't fail, students need to identify the use cases of their part and what kind of mechanical properties their part needs to have. A design needs to be made in CAD software, which ends with the student making production drawings to have his/her part produced by an external supplier.

Another challenge lies in the issue of interfacing. Each part of the drivetrain assembly has its own ideal design, but a combination of this doesn't result in the best overall assembly design. The student will have to cooperate with other team members and make trade-offs to come to the best overall design. Furthermore, the student should be able to analyse failure modes of his/her part and the effect it will have on the vehicle.

The minor students will get the responsibility to design a (large) mechanical part of the vehicle. The difficulty of this work, and the time required to successfully fulfil this task will accredit to the 15 credits listed for this project. The assessment will be done by a final presentation, where focus should be put on the process applied and lessons learned. A paper needs to be written which will get a fail or pass result.

The idea behind the set-up of this minor is that several students working on different disciplines have 2 courses in common to ensure a basic level of understanding of project- and process management and decision making. This should enable the students to work more independently, while still performing as desired. The remaining ECTS will be gathered by following courses relevant for the discipline the student is working on, in this case mechanical design.

The courses suggested for the Mechanical Design minor are a combination of the following:

Course	ECTS	Motivation	Period
SPM6102 Process Management and Decision Making	5	A well-structured process and good decision making are of vital importance in such a high-paced project as Formula Student.	Q2
CT3101 Project Management Basics	5	Project management skills are a big plus in such a complex, multidisciplinary project.	Q1
WM0821TU Responsible management of risk and safety	5	This course in the minors 'Companies and Innovation' and 'Responsible Innovation' gives insight into how risk and safety aspects of responsible innovation should be managed.	Q2