PDEng Program Mechatronic Systems Design

Final Projects November 2019 – October 2020
Requirements, Organization and Assessment

1 Introduction
The Professional Doctorate in Engineering (PDEng) degree program Mechatronic Systems Design (MSD) is a 2-year post-graduate (post-M.Sc.) internship program. This is one of twenty programs which are part of the 4TU.School for Technological Design, Stan Ackermans Institute.

The program puts a strong emphasis on Systems Thinking and skills for managing a mechatronic design project. The MSD program is supported by the High Tech Systems Center (HTSC) of the Eindhoven University of Technology (TU/e). It arranges under the Department of Mathematics and Computer Science of the TU/e and cooperates with other departments.

As part of their education and training program, our trainees execute an industrial design and development project for a period of 12 months, during the second year of the program. The high quality standard we maintain is supported by a set of general guidelines. Ton Peijnenburg and Jan-Jaap Koning (both HTSC) are responsible for the definition of projects with the companies. Guidance of trainees during the projects is under supervision of TU/e and HTSC staff members, and the coordination of the full MSD program is in the hands of the PDEng program coordinator Peter Heuberger.

2 Project Contact Information
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3 Proposal Requirements
We are looking for design projects posing a serious challenge to a graduated master in mechatronics. Typically these projects are part of the R&D roadmap of the company, though we also see projects as part of the timeline of a product development, such as for providing a demo or prototype. Preferably the project offers the opportunity to include steps like requirements engineering, specification, architecting, design, implementation, and testing, and it should last 12 months. As the trainee is expected to learn to act in a professional environment, it is good to be part of a team effort, albeit that the trainee should have his or her own responsibility as a design engineer.

The trainee is on the payroll of the TU/e during the full two years of the PDEng program. The company is asked to contribute a fee for funding the project. This includes the participation of TU/e senior staff members as a project supervisor, and also the project IP, and possibly use of licenses for software and lab facilities, which can be expanded with a special agreement if necessary. For the 2019-2020 projects the company contribution amounts to € 5800,- ex. VAT per month, though reductions can be discussed like by applying for subsidies for the use of new materials.

Projects conducted outside The Netherlands require the company to cover 50% of the expenses for two visits of the university supervisor to the actual project site.

Proposals for the project period of November, 2019 – October 2020 should be made known as soon as is possible, preferably before August 16, 2019. A short submission proposal form is available.

The company fee is based on a public private collaboration and in accordance with university’s certified general management and accountancy principles.

4 Project Allocation
As a procedure, we provide the company with the cv’s of the candidates and –if desired- visit the company with a number of eligible candidates, in order to find a good match of the company with one of the PDEng trainees.

Academic subject match with the university field of research, and fit with the capabilities of the candidates, are leading in the selection of the projects and candidates. However, first come first serve may also apply here as the number of trainees is limited.

MSD project management matches the projects with the trainees according to the backgrounds and experiences of the trainees and makes a proposal. If both the trainee and the company agree, the contract agreement can be completed for signature.

5 Supervision
The project is organized as follows:
- Project StartUp (PSU) meeting within 6 weeks after the start of the project
- Regular (~every 6 weeks) meetings with the trainee, the company mentor and TU/e academic supervisor
- TU/e academic supervisor informs the PDEng program coordinator about progress of the project
- Regular (per 2 or 3 weeks) meeting or call of the trainee with the TU/e academic supervisor
- Two formal intermediate progress evaluations by trainee, company mentor and TU/e supervisor
- Trainee submits the report to the graduation committee, one week before the final presentation
- Final presentation and evaluation by the graduation committee in the last month of the project.
5.1 Company supervision
The company is expected to assign a daily project mentor with whom the PDEng candidate can discuss at least weekly about the project. The project leader and/or group leader from the company is asked to attend the intermediate and final project evaluation meetings.

The trainee is to be well immersed into the company with access to systems, and is preferably regarded as a colleague more than as a student during the progress of the project. If needed, the trainee can use his/her TU/e laptop.

5.2 Eindhoven University of Technology
During an industrial design and development project, the Eindhoven University of Technology provides an academic supervisor who monitors progress and helps the trainee reflecting on the design approach. Knowhow of the TU/e can be involved by consulting experts from research groups in the field. The TU/e academic supervisor reviews the project report with respect to the technical and academic contents and participates in the evaluation and reflection meetings.

6 Assessment of project results
The results of the design and development project are to be assessed by the graduation committee, consisting of the academic and company supervisors, and at least two members who are external to the project. The TU/e PDEng Examination Committee has to approve the composition of this graduation committee. A detailed evaluation procedure is available, but to sketch an idea, the following aspects should be taken into account.

- Product – Can the resulting product be considered to be of high quality? Is it well designed and documented? Is the functionality satisfactory and is the construction structured and convincing? Were risks properly analyzed, including realistic mitigation strategies?
- Process – Was the product developed according to a well-defined and managed process? Was the problem adequately analyzed and handled? Did the trainee show creativity in the solution approach? Was the trainee consistent and independent in the execution of the project? Has the trainee shown that he/she has sufficient communication and social skills?

7 Formal employment status
During an industrial design and development project, the trainee remains an employee of the Eindhoven University of Technology. During a design project the trainee can use 26 leave days, exclusive the national holidays as applied by the company. For the use of leave days he/she needs the permission of the company manager and/or supervisor, and the program manager.

8 Additional Information
- Intellectual property
  TU/e - MSD agrees to transfer all intellectual property rights to the industrial partners according to the mutual agreement that will be arranged between TU/e and the industrial partner.

- Academic excellence
  The MSD program is organizationally part of the TU/e Graduate Program Automotive Systems (ASD), which is accredited by the CCTO (Certificatie Commissie voor Opleidingen tot Technologisch Ontwerper). The program quality is monitored by the Doctorate Board of Eindhoven University of Technology.

- Governance
The Scientific Director of the ASD/MSD program is:

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The program management of the ASD/MSD program is handled by:

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