

LEARNING TO WORK IN SYSTEMS-ENGINEERING-DRIVEN PROJECT TEAMS

The “Applied systems engineering” course presents various methods and approaches to analyse and structure design issues and to develop a clear overview. With this new course Mikrocentrum aims to help participants to adopt a proactive attitude within multidisciplinary project teams for the development, design and testing of complex machines and systems.

Design issues are becoming increasingly complex within the high-tech (manufacturing) industry. Multidisciplinary design teams, shorter lead times and major technological challenges are among the factors adding to this complexity. Not only the system architects, but certainly also the project participants, are increasingly being challenged to switch between the various abstraction levels, such as use cases, system requirements and system concepts. The project members often face challenges in the concrete translation into subsystem / module specifications, subconcepts and testability. For each team member, finding a good balance with his colleagues from the various disciplines is key in this respect.

This calls for systems engineering (Figure 1), defined as an interdisciplinary approach and means to enable the full life cycle of successful product, service and enterprise systems (source: Systems Engineering Body of Knowledge, www.sebokwiki.org). Under the denominator “Structured approach to complex systems design in multidisciplinary

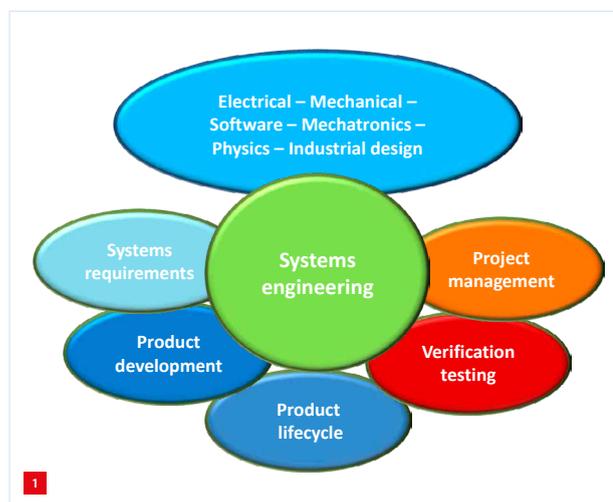
teams”, the new “Applied systems engineering” (ASE) course presents various methods and approaches to analyse and structure such design issues and to develop a clear overview.

With the ASE course Mikrocentrum aims to help participants to adopt a proactive attitude within multidisciplinary project teams for the development, design and testing of complex machines and systems.

Participants learn to assess the requirements and pre-conditions for feasibility, testability and manufacturability in such a project. The course aim is to be able to translate these aspects into balanced solutions at the concept, function, module and component level, taking manufacturing and testing into account. After having completed this course the participants are able to:

- define the set of requirements and test plans, in particular at module and component level, in such a way that cooperation between disciplines is strengthened;
- contribute to a more structured evolution of the design process;
- achieve better communication between team members in informal consultations, project discussions, presentations and documents, among other things by providing the relevant information or asking questions at the right time.

The course requires a higher vocational education (HBO, in Dutch) working and thinking level in one of the following technical disciplines: electrical engineering, mechanical engineering, mechatronics, technical software, industrial design, physics. The target group includes R&D professionals, engineers, designers and testers who work with systems engineers / system leads / system architects in multidisciplinary teams and want to operate more effectively and efficiently in a systems-engineering-driven environment.



Systems engineering calls for an interdisciplinary approach.

The course is practical and interactive in design, and covers:

- Knowledge: essence of product development processes; the different systems engineering methods; practical methodologies and models for product and system design; making a robust design of a product or system.
- Skills: translating functional requirements into a functional design, (sub)system or module; collaborating with other disciplines; translating characteristic product properties into a robustly designed product.
- Attitude: superseding domain confinements; developing a helicopter view of the design process.

The course takes five weeks, with one afternoon + evening session each week:

1. Systems and their complexity
2. Linear methodologies (such as waterfall model and V-model)
3. Iterative development methodologies (such as agile, scrum, cyclic or spiral design, and multiple-V-model)
4. Integration and testing
5. Presentation of group cases

Complex mechatronic systems to illustrate the various topics include industrial inkjet printers, 3D printers and semicon equipment such as lithography machines.

The course was developed for Mikrocentrum by:

- Jos Gunsing, innovator at MaromeTech, with extensive experience in system design in both industry, including NTS Systems Development, and education, as professor in robotics & mechatronics for Avans University of Applied Sciences from 2009 to 2017;
- Erik Puik, professor of microsystem technology / embedded systems at HU University of Applied Sciences Utrecht since 2006, with a background in both mechanical and electrical engineering and experience in system design at Océ and TNO;
- Rini Zwikker, professor of mechatronics at Saxion University of Applied Sciences from 2012 to 2017, with experience in (mechatronic) system design at DAF Trucks, Thales and Demcon.

Both Gunsing and Puik also act as teachers. The first edition of the course is scheduled for October and the course can also be delivered in-house.

INFORMATION

W.LINTSEN@MIKROCENTRUM.NL (WOUTER LINTSEN)
WWW.MIKROCENTRUM.NL



TECHNICIANS MAKE THE DIFFERENCE!

Accepting every challenge, always wanting to find the best answer. That ambition is characteristic of the technicians at Ter Hoek. Staying ahead by always wanting to go the extra mile. Based on that philosophy, Ter Hoek produces precision components for the high-tech manufacturing industry. What sets us apart from the competition? We support customers in developing high-quality, custom solutions subsequently be series-produced with unparalleled accuracy. Day after day. It is in that combination of innovative customisation and repeated precision that we find our passion.



Tomorrow's innovation, today's inspiration

www.terhoek.com



Your button or banner on the website www.DSPE.nl?

The DSPE website is the meeting place for all who work in precision engineering.

The Dutch Society for Precision Engineering (DSPE) is a professional community for precision engineers: from scientists to craftsmen, employed from laboratories to workshops, from multinationals to small companies and universities.

If you are interested in a button or banner on the website www.dspe.nl, or in advertising in Mikroniek, please contact Gerrit Kulsdom at Sales & Services.



T: 00 31(0)229-211 211 ■ E: gerrit@salesandservices.nl