



European Regional Meeting 2016

**3TU. CENTRE FOR
ENGINEERING EDUCATION**

Inventing Tomorrow's Engineering Education

Programme Booklet

Delft | 25 & 26 January 2016

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The Dutch 3TU.Centre for Engineering Education (TU Delft, TU Eindhoven, University of Twente) in collaboration with The Hague University of Applied Sciences, is pleased to welcome you to the CDIO European Regional Meeting 2016.

The landscape of the engineering and societal challenges is dramatically different from the past because of the many deep interconnections between disciplines, people and problems. The new breed of engineers will not only be comprehensive problem solvers, but also problem definers, and lead multidisciplinary teams in setting agendas and fostering innovation, requiring an entrepreneurial attitude.

The conference will emphasize how we can successfully adapt engineering programmes to the changing needs of the 21st century. It will address multi- and interdisciplinary teaching and learning, and curricular developments for a better student engagement through connecting fundamental sciences courses to the engineering discipline. You will learn about the developments, successes and failures about new learning environments like blended learning and virtual labs.

Last but not least we will discuss efforts and results how we can create a sustainable professional learning community of lecturers where learning is sparked by personal knowledge and ability to engage others with passion and creativity.

We wish you an enjoyable and inspiring conference.

Aldert Kamp

CEE Leader Delft University of Technology and CDIO Council member,

On behalf of the 3TU.CEE Board and The Hague University of Applied Sciences

Location

Delft University of Technology | Faculty of Aerospace Engineering | Kluyverweg 1 | 2629 HS Delft

Sunday 24 January				
17h00 - 19h00	Welcome reception TOWN HALL Delft (location: Markt in Delft city center)			
Monday 25 January				
08h30 - 09h00	Registration, coffee FACULTY MAIN HALL			
09h00 - 09h20	Welcome to TU Delft on behalf of Faculty Aerospace Engineering by Hester Bijl (Dean of the faculty) and 3TU.CEE Frank Baaijens (Chair 3TU.Educational Board) Welcome and agenda review by Aldert Kamp LECTURE ROOM A			
09h20 - 10h20	Keynote "Future Generation of Engineering Students" Yvonne van Sark, YoungWorks LECTURE ROOM A			
10h20 - 10h50	Coffee break (FACULTY MAIN HALL)			
10h50 - 11h30	Keynote speech "War on Talent: a Reality" Govert Hamers, President & CEO of Vanderlande LECTURE ROOM A			
11h30 - 12h45	4 Parallel sessions			
	Multi- and Interdisciplinary Engineering Education Chair: Perry den Brok, TU/e LECTURE ROOM C	Remote and Virtual Labs in Engineering Education Chair: Pieter de Vries, TU Delft LECTURE ROOM D	Engineering Education in 2030 Chair: Aldert Kamp, TU Delft LECTURE ROOM G	Workshop Engineering Education Research Chair: Kristina Edström, KTH INSTRUCTION ROOM HALL 1.01
12h45 - 14h00	Lunch (FACULTY RESTAURANT)			
14h00 - 15h00	Keynote "Engineering Education For Industry 4.0" Sabina Jeschke, Vice-Dean RWTH Aachen University LECTURE ROOM A			
15h15 - 16h45	3 Parallel sessions + 3 campus tours			
	Multi- and Interdisciplinary Engineering Education Chair: Perry den Brok, TU/e LECTURE ROOM G	New Learning Environments in Engineering Education Chair: Michiel Schuurmans, TU Delft Introduction: LECTURE ROOM D Workshop: SELF-STUDY SPACE IN MAIN HALL	Redesigning Engineering Curricula Chair: Maartje van den Boogaard (ICLON) LECTURE ROOM E	Campus tours* • TU Campus tour • AE Campus tour • THUAS Campus tour DEPARTING FROM ENTRANCE HALL
16h45-17h30	Refreshment & light snack (FACULTY MAIN HALL)			
17h30, 18h00, 18h30	3 bus departures to Delft city centre (DEPARTING FROM MAIN HALL)			
19h30 - 22h00	Dinner in the historic town centre at RESTAURANT DE PRINSENHOF (welcome from 19h00)			

* **TU Campus tour**
Extension School with studios for online education; D:DREAM Hall

AE Campus tour
Aerospace experimental labs for education and research; teaching and learning facilities

THUAS Campus tour
Minor: 'Robotics and vision Design'
'Water treatment project'
'Human Assistance project'
learning lab Technology for Health: 'Automatic Wheelchair'

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08h45 - 09h30	Keynote "Engineering Ethics" Jeroen van den Hoven, Dean faculty of Technology, Policy and Management, Values Technology and Innovation, TU Delft LECTURE ROOM A				
09h30 - 10h30	4 Parallel sessions				
	Maths and Engineering: Making the Connection Chair: Jan van der Veen, UT LECTURE ROOM B	Engineering-Specific Opportunities in Online Education Chair: Gillian Saunders, TU Delft LECTURE ROOM C	Formative Assessment and Feedback Chair: Perry den Brok, TU/e LECTURE ROOM D	Improve Teaching by Learning from Critical Colleagues Chair: Jens Bennedsen (Aarhus Univ.) MEETING ROOM 7	
10h30 - 11h00	Coffee break (FACULTY MAIN HALL)				
11h00 - 12h15	4 Parallel sessions + 3 campus tours*				
	Maths and Engineering: Blended learning Chair: Jan van der Veen, UT LECTURE ROOM B	Online Playground Chair: Gillian Saunders, TU Delft SELF-STUDY SPACE IN MAIN HALL	Blended Learning in Continuous Professional Staff Development Chair: Suzanne Hallenga-Brink, THUAS LECTURE ROOM E	Improve Teaching by Learning from Critical Colleagues Chair: Jens Bennedsen (Aarhus Univ.) MEETING ROOM 7	Campus tours* <ul style="list-style-type: none"> • TU Campus tour • AE Campus tour • THUAS Campus tour DEPARTING FROM ENTRANCE HALL
12h15 - 13h45	Lunch (FACULTY RESTAURANT), wrap-up and good-bye				
13h45 - 15h00	2 Parallel Regional Meetings + 3 campus tours*				
	European Regional Meeting Jens Bennedsen, Frederik Georgsson, Juha Kontio LECTURE ROOM B	UK Regional Meeting Paul Hermon, Matt Murphy MEETING ROOM 7	Campus tours* <ul style="list-style-type: none"> • TU Campus tour • AE Campus tour • THUAS Campus tour DEPARTING FROM ENTRANCE HALL		
15h00 - 16h00	CDIO Council Meeting MEETING ROOM 7				

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11h30	4 Parallel sessions					
12h45	<p>Multi- and interdisciplinary engineering education Chair: Perry den Brok, TU/e</p> <ul style="list-style-type: none"> * Literature review and framework (A. van den Beemt & A. van de Ven, TU/e) * Interdisciplinary education in Built Environment (Marco Lub, TU Delft/CEE) * Technical Medicine Group (Sophie v Baalen, M. Boon, UT) * Next Generation Robots - (Chris Verhoeven, Robotics Institute TU Delft) 	<p>Remote and Virtual Labs in Engineering Education Chair: Pieter de Vries, TU Delft</p> <ul style="list-style-type: none"> * Towards Virtual Labs (Lisa Jansen, TU Delft) * GO-Lab Project (Ton de Jong, UT) * Experiences with Remote and Virtual Lab Experiments in Water Treatment (Anke Grefte, TU Delft) * Discussion about ideas, opportunities, success factors and threats of developing virtual labs for your engineering curriculum. 	<p>Engineering Education in 2030 Chair: Aldert Kamp, TU Delft</p> <ul style="list-style-type: none"> * Heads-on and hands-on workshop (Aldert Kamp, TU Delft) * Diversifying graduate profiles without losing depth; developing education scenarios for 2030. * Bring your ideas how to cope with new professional engineering skills or shifts in their importance in already fully packed curricula. 	<p>Workshop Engineering Education Research Chair: Kristina Edström, KTH</p> <ul style="list-style-type: none"> * How education research can help strenghten and innovate engineering education. 		
15h15	3 Parallel sessions + 3 campus tours					
16h45	<p>Multi- and interdisciplinary engineering education Chair: Perry den Brok, TU/e</p> <ul style="list-style-type: none"> * Workshop analysing and improving your interdisciplinary education 	<p>New Learning Environments in Engineering Education Chair: Michiel Schuurmans, TU Delft</p> <ul style="list-style-type: none"> * Learn how to use failures in engineering in your course in an interactive workshop about Forensic Engineering CDIO style (Michiel Schuurman, TU Delft) 	<p>Redesigning Engineering Curricula Chair: Maartje van den Boogaard (ICLON)</p> <ul style="list-style-type: none"> * Hands-on and heads-on workshop, discussing and learning about different approaches for, and perceptions of, the design and implementation of curricular change. The inspiration for this workshop is a project by the three Dutch universities of technology mapping curricular change across the institutions using different models and approaches for education design. 	<p>TU Campus tour Extension School with studios for online education; D:DREAM Hall</p>	<p>AE Campus tour Aerospace experimental labs for education and research; teaching and learning facilities</p>	<p>THUAS Campus tour Minor: 'Robotics and vision Design' 'Water treatment project' 'Human Assistance project' learning lab Technology for Health: 'Automatic Wheelchair'</p>

Please note that the campus tours and a number of parallel sessions have limited places available. You need a ticket to participate. Tickets can be obtained at the conference information desk in the main hall.

09h30	4 Parallel sessions						
10h30	Maths and Engineering: Making the Connection Chair: Jan van der Veen, UT <ul style="list-style-type: none"> * Simulations-based mathematics in Mechanical Engineering (Mikael Enelund, Chalmers) * Project-based Maths at DTU (Karsten Schmidt, DTU) * Innovation of 1st-yr Mathematics in Delft (Ingrid Vos, TU Delft) 	Engineering-Specific Opportunities in Online Education Chair: Gillian Saunders, TU Delft <ul style="list-style-type: none"> * Online Education at TU Delft: What do we do? And why is Online Education also CDIO? (Willem v Valkenburg, TU Delft Extension School) * Teaching an active online Master Course in Linear Modelling (Sonell Shroff, TU Delft AE) * Open forum Q&A of presenters 	Formative Assessment and Feedback Chair: Perry den Brok, TU/e <ul style="list-style-type: none"> * Peer Feedback in Design (Tijn Borghuis, TU/e) * Using automatic and semi-automatic feedback to support students's learning process (Lauri Malmi, Aalto University) 	Improve Teaching by Learning from Critical Colleagues Chair: Jens Bennedsen (Aarhus Univ.) <ul style="list-style-type: none"> * Workshop "Self-evaluation and rubrics" (Jens Bennedsen, Aarhus Univ.) 			
11h00	4 Parallel sessions + 3 campus tours						
12h15	Maths and Engineering: Blended learning Chair: Jan van der Veen, UT <ul style="list-style-type: none"> * Best practice of blended learning in Calculus (Hans Cuypers, TU/e) * MyMathLab and Mastering (JW Polderman, UT) * Towards combined learning analytics for improving CDIO curricula (Ewoud de Kok, FeedbackFruits) 	Online Playground Chair: Gillian Saunders, TU Delft <ul style="list-style-type: none"> * Participants will go round in a room and be able to trial online education tools such as: online assignment options in Edge, Video Scribe, Making Cartoons, Editing and recording videos, Playing with green screens. Participants will be given a take-home brief on tools they played with and recording advice, as well as a USB stick with anything they created. 	Blended Learning in Continuous Professional Staff Development Chair: Suzanne Hallenga-Brink, THUAS <ul style="list-style-type: none"> * A practice-what-you-preach, facilitated, active learning experience for those attending; An interactive sharing of ideas of both what staff needs to develop in as well as how they should be facilitated in this venture. We like to combine new tech-savvy ways with (new and old) didactics and of course CDIO-principles. Workshop produced by Marja Bakker and Johan de Bruin (2BLearning). 	Improve Teaching by Learning from Critical Colleagues Chair: Jens Bennedsen (Aarhus Univ.) <ul style="list-style-type: none"> * Workshop "Learning and getting inspiration from your colleagues" (Jens Bennedsen, Aarhus Univ.) 	TU Campus tour Extension School with studios for online education; D:DREAM Hall	AE Campus tour Aerospace experimental labs for education and research; teaching and learning facilities	THUAS Campus tour Minor: 'Robotics and vision Design' 'Water treatment project' 'Human Assistance project' learning lab Technology for Health: 'Automatic Wheelchair'
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Drs. G.L.M. Hamers
President & CEO Vanderlande Industries



Since January 1, 2014, Govert Hamers (1952) is President and CEO of Vanderlande Industries. Vanderlande Industries is providing intelligent high-value materials handling solutions and services for logistics services to leading companies around the world. From baggage handling on airports to automated order picking and consolidation with food retail, fashion and e-commerce. Besides good products and service, highly motivated and skilled staff is increasingly becoming a differentiator. In his presentation “War on Talent: a reality”, Mr. Hamers will focus upon the belief that competences and people skills besides technical know-how are needed in a world of technology to ensure and guarantee our future success and he will reflect on the role of academic education in this process.

Prof. dr. Sabina Jeschke
Vice-Dean RWTH Aachen University



Based on the technological concept of cyber-physical systems and the internet of things, the vision of “industry 4.0” is characterized by highly individualized and at the same time cross-linked production processes. Among other aspects it entails the vision of the smart factory, allows cars to drive without a driver and provides the infrastructure for collaboration in the “global village”. In consideration of future employment domains, engineering students have to be prepared to meet the demands of society 4.0 and industry 4.0 – resulting from the characteristics of the fourth industrial revolution.

The talk will discuss three hypotheses, which underline implications for engineering education:
 “Informatics is the new Latin”: Smart factories require engineers who “speak code”.
 “Startups are the new motor for the economy”: Innovation comes from fresh minds.
 “Transparency is the new green”: Learning Analytics will change the ways we teach.

In the context of the development from purely document-based management systems to complex virtual learning environments (VLEs), a shift towards more interactive and collaborative components within higher educational e-learning is absolutely necessary. As a result, engineering education is faced with a large potential field of research, which ranges from the technical development and didactical conception of new VLEs to new forms of human-machine-interaction – who wouldn’t want to work hand in hand with a robot?

Yvonne van Sark
Youngworks



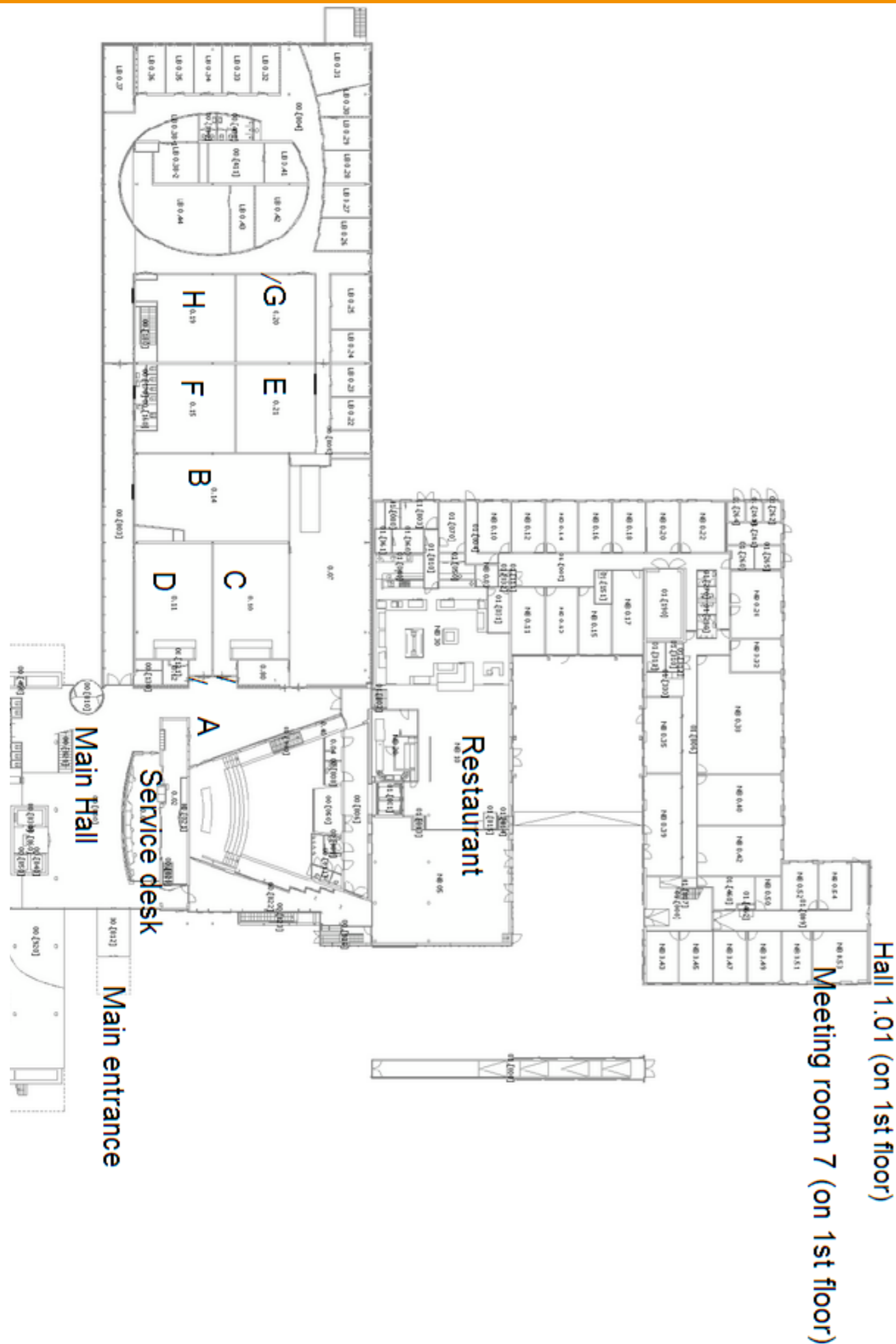
(Photo: André Bakker)

Our students are the future professionals. They will enter into professions that are not known today; they will use and develop techniques that may be unthinkable of today. The only thing we know for certain is uncertainty. Besides, our students themselves change. What are main trends and aspects that we should take account of, in order to fit education to their needs and in order to fulfill societal demands? Yvonne van Sark, co-owner and advisor at Youngworks, agency for youth communication, will inspire with insights about the new generation that is about to enter our classrooms.

Prof. dr. Jeroen van den Hoven
Dean faculty of Technology, Policy and Management, Values Technology and Innovation at TU Delft



Technological innovation plays a key role in the 21st century, in the field of bio-engineering, the energy transition, sustainability, mobility, urbanisation and infrastructure, for example. That raises fundamental questions, such as what does the innovation of technical systems mean for our freedom and for our responsibilities? How do we deal with security and risks? The world is changing beyond belief and our way of thinking about these issues therefore has to change as well. Technology is where everyday reality is determined: we are literally developing the future, the way we live, work, communicate and play. If you bring ethics and engineering together at an early stage, moral values like privacy and autonomy can be included in the design phase of new systems, technologies and applications. This is what we like to teach our students. Prof. Van den Hoven will elaborate on this in his keynote.



The 3TU.Centre for Engineering Education (CEE) is set up to support and research educational innovations that are taking place at the three universities of technology in the Netherlands: Delft University of Technology, Eindhoven University of Technology and University of Twente. It's main goal is to jointly innovate engineering education, and share expertise on all of its educational innovations to enable our teaching staff to continuously push the quality of our engineering education to a higher level, to assure that our young graduates are optimally prepared for coping with future engineering and societal challenges. Check out www.3tu.nl/cee to learn more about the engineering education innovations at our three universities.

Although not yet all three universities of the CEE are a member of the CDIO network, the engineering education in Delft, Eindhoven and Twente is well aligned with the CDIO framework and shows a good compliance with the CDIO

Standards. One of the best demonstrations that our programmes provide students with an education stressing engineering fundamentals set in the context of Conceiving — Designing — Implementing — Operating (CDIO) real-world systems and products, is given by the many successes in the innovative design projects within the curricula, and the extracurricular student design-build-operate projects. An obvious example of how we encourage our students to challenge themselves is in the enthusiasm in student projects like the designing and developing of solar cars. In 2015 all three Dutch Universities of Technology were very successful in the Bridgestone World Solar Challenge in Australia with their solar cars. The Nuon Solar Team of TU Delft won the 3000 kilometre race for the sixth time, Solar Team Twente became second. The Solar Team Eindhoven won the race in the category 'Family car' with their Stella Lux. CDIO is the DNA of many if not all our engineering educational programmes.



The winning teams of the three Dutch Universities of Technology in Australia. (Photo: Bart Overbeeke)



Oostpoort, one of the historical monuments in Delft.

