4TU Master's Construction Management & Engineering Newsletter
This newsletter is published at irregular intervals **Summer 2016**
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Introduction

The 4TU CME newsletters focus on interesting and current topics in the field of the Master's programme in Construction Management & Engineering (CME).

This newsletter informs you about:

- Diploma annotation IDM
- Recommended course
- Yearly evaluation 4TU-CME programme
- Shock Save Nepal project
- Asset Management Game launch in VR LAB
- 3TU becomes 4TU
- Workshop 'Impactful Active Classroom Techniques for Engineering Education'
- Drones for the engineer of the future

We hope you will enjoy reading this newsletter.

Diploma annotation IDM (CME TU Delft)

Are you a CME student and do you want to:

- Become a ζ-engineer who is able to integrate technology (ß) and management (ϒ)?
- Graduate with specific technical domain knowledge, but also obtain sufficient management knowledge and skills so that you are well prepared for future roles in complex and multidisciplinary engineering projects?
- Deserve recognition for this with an ''extra star'' on your MSc diploma within the regular 120 ECTS?

In Delft there is the possible for you to choose for the Integral Design Management (IDM) diploma annotation by using your elective space in a dedicated way.

In order to obtain the IDM annotation you must do three things:

1) A number of mandatory IDM courses.
2) A multidisciplinary project with an 'IDM flavor' (80/20 engineering vs. management)
3) The graduation project in your specialisation domain, but with an 'IDM flavor' (80/20 specialisation domain vs. IDM)

IDM is fully integrated within the 120 ECTS of the Master by using the elective space in a dedicated way.

More information?

Check the flyer by clicking this link or contact Prof.dr.ir. A.R.M. Wolfert: R.Wolfert@tudelft.nl

Recommended course: Multidisciplinary Project (10 EC)

During the years, major projects in the field of civil engineering have become increasingly more multidisciplinary. On the one hand, it takes the spectrum of possible technical solutions by technological innovations. On the other hand, the context in which these projects must be realised is complex: an urbanised environment with many complex and often conflicting conditions from business or administrative angle.
In this kind of multidisciplinary projects, a project manager would need the specialisations of different disciplines. This makes the Multidisciplinary Project – where students of each location can work together- a highly recommended course for each CME student.

During the multidisciplinary project, students solve an actual and recent civil engineering problem in a multidisciplinary team. The team needs to integrate several studies and designs into a coherent entity, based on knowledge, understanding and skills acquired in the preceding years. Attention will be on quality control and the evaluation of the design process.
The course is divided into three phases:

- phase 1: inception plan;
- phase 2: preliminary design and studies;
- phase 3: process evaluation with respect to interdisciplinary aspects;

These phases must lead to a final report.

The multidisciplinary teams consist of about five students. Each student is assigned to represent a specific discipline (i.e. architect, structural engineer, project manager, building services engineer, etc.) with a specific task and responsibility in the team, covering structural design, building physics, finishes, building services, real estate development, construction and management or architectural and functional design.
Click here for more specific information about the Multidisciplinary Project course, or contact the lecturer of the course; Dr.ir. M.G.C. Bosch-Rekveldt
Email: M.G.C.Bosch-Rekveldt@tudelft.nl

Students of each CME location can choose this challenging multidisciplinary course as elective course.

Yearly evaluation 4TU-CME programme

This summer, our yearly evaluation of the MSc Construction Management and Engineering is at hand. Because the questionnaire will be send to all CME-locations, you have received an email from www.360test.nl.

On behave of the directors of education of the MSc programme in CME, we kindly ask you to fill out the questionnaire. We will use the answer to further improve our MSc.
Thank you in advance!

Shock Save Nepal project

At this moment, the third delegation CME students are helping the earthquake victims in the Shock Save Nepal project. One year after the earthquake there is still much work to be done in rebuilding Nepal earthquake safe.

The students are conducting research in Nepal to create building plans for low-budget, earthquake-resistant, permanent housing using local resources and labour. The project will serve people living in temporary shelters for almost a year.
The end result of the project will not only be viable designs for affordable houses in earthquake sensitive areas, but leaving the Nepalese plans in such a way that they will be able to execute them.

Creating earthquake resistant structures is not a new phenomenon. Take for example Tokyo, where innovative techniques and detailed seismic knowledge have made it possible to build the most impressive earthquake resistant skyscrapers. Why is it then that here in Nepal it is a struggle to realise a single home?

Nepali people have many professions; they are their own mason, carpenter and plumber. Only some people are specialised. In rural villages, villages up the mountain that can often only be reached on foot, people are mainly farmers. Working the land throughout the whole year, they can barely supply their family with food. Materials not produced in the village need to be obtained from the Kathmandu valley, which can take days – days not spend working the land. In addition, due to the poor accessibility of the mountain villages, sometimes the only option is to carry everything there.

How can these people build a home when all they have is basic skills and no money for materials? Due to costs and transportation, importing building materials is not a feasible option for rural villages. If the materials could be produced locally, it would eliminate some major obstacles. Building with nature has been done since time immemorial. Houses build of natural stones, blocks of compressed clay, timber or bamboo can be found all around the world. But are these houses earthquake resistant? The damage in rural Nepal due to the earthquake is severe; over 90% of the houses collapsed. It is clear that the known building methods need to be improved. Recently, team 3 has investigated various building methods to conclude which are applicable in these rural areas, taking into account seismic performance, availability of materials, transportation, and cultural values. Earth based technologies and natural stone structures score high on the latter three categories, but seismic performance is low due to absence of tensile strength. The bearing materials (like solid stones or earthen bricks) need to cooperate with tensile elements (like horizontal wooden beams or vertical bamboo bars). When adding these tensile elements to the structure it is very important to ensure sufficient bonding between the two structural materials, for the structure needs to act as a whole.

This is just a short introduction of what the Shock Save Nepal project does. Are you interested in the work and experiences of this third Nepal team? On Facebook they share their experiences, pictures and the findings of their research.
See: https://www.facebook.com/shocksafenepal

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Asset Management Game launch in VR LAB

Next year, the UT course in Asset Management will undergo a complete make over. The new course will be an innovative blended learning course, in which a serious game is implemented. By playing the games, students will be the problem owner in a specific case in Asset Management. By playing 4 individual modules and in an overreaching context students will learn and experience the consequences of specific actions taken in Asset Management.The games are simulations of real-world problems, and a challenging competition isintegrated.
On the 17th of June, there was the introduction of the game in the VR-Lab of the UT.
Interested in the serious games? Try the first module "Gasolution" at www.gasolution.nl

If you want to follow this course next year, look at www.4tu.nl/cme/en/students/other_location/ to see how to apply.

3TU becomes 4TU

The Wageningen University and 3TU.Federation strengthen cross-overs between high tech with agri & food with collaboration in 4TU.Federation.

Wageningen University joins the collaboration between the three technical universities in the Netherlands (3TU.Federation). As of today the federation will be known as 4TU.Federation, or simply 4TU, and the cooperation in the field of education and research will be expanded. The four technical universities of Delft, Eindhoven, Twente and Wageningen will intensify their collaboration to strengthen the interaction with industry.

With Wageningen University joining, some interesting crossovers between high tech and agri & food come to sight as well as in the areas of water and environment.
By broadening the coordination and cooperation, which is currently taking place by expanding the cooperation to four universities, a more powerful voice can be made about what is needed to realise the Dutch ambitions in the field of scientific research and technological innovation. In addition to an effective alignment to e.g. the Ministries of Education and Economic Affairs, a more substantive alignment is being sought on education and research. In a first effort, the four universities presented 'Agenda voor Nederland, inspired by technology' as a contribution for the National Research Agenda. It presented us with 10 challenges, aimed at finding solutions to the increasingly complex societal problems in the areas of healthcare, sustainable production, circular economy, energy, mobility, water, food and social security, linked to economic opportunities and knowledge strengths in the Netherlands.
Because you are a student of a 4TU Master's programme, you are regarded as student at all four institutes. Any student registering for one of the 4TU study programmes is automatically registered at the other universities. This additional registration is needed in order to be able to use the education facilities at all four locations, for example the digital learning environment for subjects that are taught virtually at one of the other universities.
It all means you can get the benefit of the strengths of all the universities combined!

TU Delft Delft University of Technology
TU/e Technische Universiteit Eindhoven University of Technology
UNIVERSITY OF TWENTE.
WAGENINGEN UR For quality of life
4TU.

Workshop 'Impactful Active Classroom Techniques for Engineering Education'

Workshop facilitators Donald Carpenter and Andrew Gerhart of Lawrence Technological University came to Enschede, Delft and Eindhoven to demonstrate the pedagogical classification system for Active and Collaborative Learning (ACL) that they developed. On June the 3rd, Donald and Andrew visited Enschede. Sven Laudy, programme developer of 4TU-CME, participated in the workshop. Below is his account of this inspiring workshop.

ACL separates proven classroom techniques into three levels. Each increasing level requires additional time and resources to implement (both instructor time and classroom time) but has the potential for deeper learning, retention, and team based interactions. A Level 1 ACL includes simple classroom techniques referred to in the literature as "Think Pair Share", "Minute Papers", or "Quick Thinks." This workshop introduced the concept of their classification system, which includes Project/Problem Based Learning, and spent time demonstrating several Level 2 and Level 3 techniques that have been implemented by hundreds of faculty at dozens of institutions and in all disciplines from humanities to engineering.

After an introduction to the workshop and their classification system, the participants engaged in three Level 3 ACL techniques – **Jigsaw, Gallery Walk, and Subject Matter Debate** intertwined around a common theme (energy) that all participants could relate too. These three techniques were used individually as well as combined and are independent of content (in other words, they could be used in any discipline or classroom setting). These methods were effective at stimulating deep learning around complex problems and to provide structured learning around interdisciplinary teams. After the break participants experienced a specific Level 2 technique (Rank Order) that could be used to demonstrate the power of teamwork and stimulate curiosity on course content. Participants learned the basics of developing and applying Rank Order exercises for student motivation, assessment of content based knowledge, and fostering teamwork. The session also included a brief discussion of teamwork formation and exercises that can be used to foster productive interdisciplinary team based interactions.

The workshop was organised by CEE. The 4TU.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: UT, TU/e and TU Delft. Its main goal is to innovate engineering education and share expertise on educational innovation. The aim is to enable teaching staff to enhance the quality of engineering education to a higher level, to assure that our young graduates are optimally prepared for coping with future engineering and societal challenges. More info can be found on: http://www.4tu.nl/cee.

Are you also interested in embedding impactful Active Classroom Techniques in your courses? Please contact Lisa Gommer (e.m.gommer@utwente.nl) from CEE or Sven Laudy (s.laudy@utwente.nl), programme developer of 4TU-CME.

Drones for the engineer of the future

How can drones and other technical innovations facilitate the work of a civil engineer?
That was the subject of the symposium of Study Association ConcepT (UT) that was held at the 23th of March in Enschede.

'We don't want to show what civil engineers are already doing, but we want to show how tools can facilitate their work in the future', says Job van Staveren symposium Committee member of ConcepT. It is against this background making the theme of the symposium 'new tools for engineers'.

'For some innovations companies do not know why and how to apply them' complements Van Staverens' colleague Marthe Oldenhof. 'During the workshops and the business market at the symposium, the companies wanted input from students on applications of these new technologies'.

Inspection of roofs

One of those new technologies is the drone. Walter Hoff of the company iDrones told the symposium visitors how drones can be used, for example in the maintenance of high-voltage pylons or mapping the amount of sand at an asphalt plant.
Hoff: 'Rijksvastgoedbedrijf is working on the inspection of roofs of monuments in cities. Regularly, you can only do this inspection with work platforms, because it is not allowed to walk over the roof. But how can you do a proper inspection in that case?'
'Drones make it easy to inspect areas that are hard to reach. Besides, drones can provide high-quality images. Another example: for the inspection of the railway system, you can keep using trains and timetables during the inspection by drones'.

Outdoor reading

At the end of the morning, Hoffs reading was interrupted by the fire alarm in the building. The complete building had to be evacuated for what turned out to be a false alarm. Uninterrupted Hoff continued his guest lecture in the outside.

Another example he mentioned: 'The NS is working with drones in the occasion there are people walking along the railway. The drones can quickly inspect if those people can be a danger for the train drivers'. Back in the building, Hoff showed how drones can be used for 3D mapping and charting stocks for example in an asphalt plant. 'Drones can help you collecting very objectively data. It can help the plant to determine how much sand or gravel is saved per depot'.

The symposium of study Association ConcepT attracted around 120 participants.

Enjoy the summer
and
Happy holidays!