Virtual Exchange Global Alliance

TU Delft	Next Generation Infrastructures (UD9003)		
Course description	1. Explore the challenges and complexity of both global and local infrastructure (IT/Telecom, Energy, Water and Transportation) and how to make the best decisions to improve it.		
Domain	**Engineering**		
Prerequisites	Analytical skills, basic knowledge of infrastructures (energy, transport, telecoms) and basic knowledge of complex systems will be helpful. This course targets student who are in the last phase of or have completed a bachelor in engineering, public management or business administration.		
Level	**2/3 year bachelor, start master**		
Language	English		
Number of credits and workload	Number of credits: 2	Number of hours: 6 to 8 hours per week	Total number of hours: 56 hours in total
Semester period and Start date course	February semester	Start date: **March 2019**	
Application deadline	**February 1, 2019**		

Full course description	We increasingly depend on reliable and affordable supply of energy, water, transport, telecommunication and information services to improve livability and facilitate economic development. However, today's infrastructure systems are drastically changing. They are becoming more and more web-based, interconnected and transnational, with increasingly fragmented public and private ownership, while new technologies are on their way. The capital need for investment in new infrastructures and upgrading of ageing infrastructures is tremendous. During this infrastructure course you will learn to examine these challenges from a new, combined engineering and social sciences perspective. Subsequently we will focus on the challenges that complex adaptive infrastructure systems pose for governance, management and decision-making in a world full of uncertainties. In the last part of the course, we will introduce a selection of topics and tools (modeling & simulation, value sensitive design, standards, ICT-architecture) which will help you to improve the adequacy of infrastructure systems and services, while dealing with the risks and vulnerabilities of infrastructure interdependencies. In our case studies, we will focus on topical developments and policies, such as sustainable energy transition (including smart grids), urbanization and its impact on infrastructures, the challenges of climate change and water scarcity, and the phenomenon of inverse infrastructure development (self-organization). If you are interested or involved in the functioning of today's and tomorrow's infrastructures, this course is an exceptional learning opportunity, whether you are a student or a professional. You will be interacting with peers all over the world and we will present a large number of case studies. The course is based on the results of an extensive and renowned international research programme titled 'Next Generation Infrastructures' (NGInfra).	
Platform and link to course description	EdX	https://www.edx.org/course/next-generation-infrastructure-delftx-ngix-1
Course description in study guide	http://studiegids.tudelft.nl/a101_displayCourse.do?course_id=48481	
Lecturer(s)	Prof.mr.dr. E.F. ten Heuvelhof Prof. dr.ir. M.P.C. Weijnen	

Extra Course information	What you'll learn • To diagnose the main challenges with respect to infrastructure (water, energy, transport, ICT) development for the future in a social-technical perspective • Decision making skills in a complex and uncertain world • Analytical and design support tools for improving infrastructures • How to discuss and explain challenges impacting and influencing global infrastructure
Picture of course	
Final examination date and time /period	TBA
Examination registration deadline or drop-out deadline	Examination registration before: NA There is no drop-out deadline.
Type of examination	Quizzes and assignments during the MOOC. The final product will be policy brief for a CEO about an infrastructural challenge
Midterm examination?	☐ no
Previous exam papers available	☐ yes ☐ no
Resit? and date	☐ NA
Grade release and transcript release	TBA