UNIVERSITY OF SPATIAL ENGINEERING.

PROF. DR. VICTOR JETTEN | DRS. TINY LUITEN MBA
1. WHY ON EARTH SPATIAL ENGINEERING?

2. WHAT CAN YOU DO?

3. HOW TO BECOME A SPATIAL ENGINEER?

4. WHAT IS THERE AFTER YOU FINISH?

5. PRACTICAL INFO
Do you recognize these?
1. WHY ON EARTH SPATIAL ENGINEERING?

WICKED PROBLEMS

- St MAARTEN and IRMA
  - When is the next hurricane?
  - Are there technical solutions?
  - Are there spatial solutions?
  - Can we improve resilience?
## WICKED PROBLEM FRAMEWORK

<table>
<thead>
<tr>
<th>Certain Knowledge</th>
<th>Technicalities</th>
<th>Certain Needed</th>
<th>Inspiration Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder Consensus</td>
<td>Stakeholder Disagreement</td>
<td>Compromise Needed</td>
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<tr>
<td>Uncertain Knowledge</td>
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1. WHY ON EARTH SPATIAL ENGINEERING?
LEARN ABOUT ALL THREE KNOWLEDGE AREAS TO SOLVE WICKED PROBLEMS

2. WHAT CAN YOU DO?
2. WHAT CAN YOU DO?

USE TECHNICAL ENGINEERING

- TO MEASURE AND MODEL
- TO DESIGN INTERVENTIONS
- TO MATCH THESE INTERVENTIONS WITH EXPECTATIONS OF STAKEHOLDERS
2. WHAT CAN YOU DO?

USE SPATIAL PLANNING & GOVERNANCE

- To ensure socially robust interventions
- To include stakeholders
- To understand socio-economic drivers of change
2. WHAT CAN YOU DO?

USE SPATIAL INFORMATION

- TO QUANTIFY THE PROBLEM
- TO PROVIDE DATA FOR MODELLING & PREDICTIONS
- TO COMMUNICATE POSSIBLE SOLUTIONS
2. WHAT CAN YOU DO?

A GRADUATE OF THE SPATIAL ENGINEERING PROGRAMME

- KNOWS THE SOCIO-ENVIRONMENTAL DRIVERS OF SYSTEM EARTH
- USES SPATIO-TEMPORAL ANALYSIS & THE FORMULATION OF MODELS
- WORKS ON PROJECTS IN AN INTERNATIONAL, MULTICULTURAL & INTERDISCIPLINARY TEAM
3. HOW TO BECOME A SPATIAL ENGINEER?

✓ CURIOSITY
✓ A BROAD MULTIDISCIPLINARY VIEW
✓ INTEREST IN (INTERNATIONAL) SPATIAL PROBLEMS
✓ AT LEAST THE TECHNICAL (ENGINEERING) OF THE 3 KNOWLEDGE FIELDS
✓ ACCREDITATION EXPECTED IN FEB 2018

✓ Note: no start in January (yet) and HBO needs a pre-master
3. WHAT DO STUDENTS NEED TO START?

WE WILL LOOK ON AN INDIVIDUAL BASIS AT YOUR CV AND MAKE AN APPOINTMENT WITH US!

EDUCATION-ITC@UTWENTE.NL

CIVIL ENGINEERING, ADVANCED TECHNOLOGY, CREATIVE TECHNOLOGY
APPLIED EARTH SCIENCES
CIVIELE TECHNIEK
ARCHITECTURE, URBANISM AND BUILDING SCIENCES
AARDWETENSCHAPPEN
GLOBAL SUSTAINABILITY SCIENCE
SOCIALE GEOGRAFIE EN PLANLOGIE
TECHNISCHE PLANLOGIE
FUTURE PLANET STUDIES
AARDE EN ECONOMIE
AARDWETENSCHAPPEN
LANDSCHAPSARCHITECTUUR EN RUIMTELIJKE PLANNING
MILIEUWETENSCHAPPEN
BODEM-WATER-ATMOSFEER
INTERNATIONAAL LAND EN WATERBEHEER

ATLAS
UNIVERSITY COLLEGE UTRECHT
UNIVERSITY COLLEGE ROOSEVELT
UNIVERSITY COLLEGE GRONINGEN
BETA-GAMMA
THE FIRST YEAR OF SPATIAL ENGINEERING.

CAS STUDY PROJECT 1 (15 EC)  
QUARTILE 1  
Climate resilient cities  
RISK & RESILIENCE

CASE STUDY PROJECT 2 (15 EC)  
QUARTILE 2  
Food and water security  
SUSTAINABILITY

CASE STUDY PROJECT 3 (15 EC)  
QUARTILE 3  
Man-induced earth quakes  
LEGITIMACY

ELECTIVES (15 EC)  
QUARTILE 4  
In support of MSc research

3. HOW TO BECOME A SPATIAL ENGINEER?
3. HOW TO BECOME A SPATIAL ENGINEER?

**PHASES IN A CASE STUDY PROJECT**

<table>
<thead>
<tr>
<th>DEFINE THE PROJECT</th>
<th>FIND ANSWERS/SOLUTIONS</th>
<th>REPORT</th>
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<tbody>
<tr>
<td>FACT FINDING &amp; OBJECTIVES</td>
<td>MODELLING</td>
<td>DISCUSSIONS WITH SPECIALISTS</td>
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<tr>
<td>FIND KNOWLEDGE</td>
<td>DATA GENERATION</td>
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<tr>
<td>o CHOICE TOPICS (1 EC)</td>
<td>STAKEHOLDER VIEWS</td>
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<tr>
<td>o TUTORIALS</td>
<td>DESIGN INTERVENTIONS</td>
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<td>o SKILL LEARNING LINE WORKSHOPS</td>
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**WITHIN EACH PROJECT:**
- GROUP WORK
- INTERACTION WITH STAKEHOLDERS
- INDUSTRY/CONSULTANTS
- INTERNATIONAL CLASSROOM
- PERSONAL DEVELOPMENT DOSSIER
Choice Topics
• personal (but balanced) selection 10 out of 20 topics

Technical
• TE1.A: flood modelling
• TE1.B: hydrological monitoring and statistics
• TE2.A: systems analysis
• TE2.B: dynamic modelling
• TE3.A: Structural vulnerability of the built environment
• TE3.B: Seismic hazard above gas reservoirs (regional scale)

Spatial
• SIS1.A: spatial data visualization
• SIS1.B: digital elevation models creation
• SIS2.A: remote sensing in general
• SIS2.B: image classification
• SIS2.C: spatial statistics
• SIS2.D: vegetation mapping and monitoring
• SIS3.A: 3D/Temporal visualizations in collaborative environments
• SIS3.B: crowdsourcing and citizen science

Planning and Governance
• SPG1A: Climate Change and social vulnerability
• SPG1B: Integrated urban water management and governance
• SPG2A: Markets and value chain analysis
• SPG2B: Evidence based policy analysis
• SPG3A: Spatial knowledge management
• SPG3B: Rights and restrictions in the built environment
3. HOW TO BECOME A SPATIAL ENGINEER?

THE SECOND YEAR OF MASTER’S SPATIAL ENGINEERING.

- FIELDTRIP
  - Fieldtrip, International Skills: 7.5 EC
- MSC RESEARCH
  - Research & Academic Skills, MSC Research Proposal Writing, Individual Thesis: 37.5 EC
- INTERNSHIP
  - Project Management Skills, Prove MSC Level Work Experience: 15 EC

In total 3 QUARTILES GROUP WORK VERSUS 5 QUARTILES INDIVIDUAL
Research Themes @ ITC

- People, Land and Urban Systems
- Natural Hazards and Disaster Risk Reduction
- Geo Resources and Geothermal Energy
- Agriculture and Food Security
- Biodiversity and climate
- Water Cycle and Climate
- Coastal dynamics and ecosystems
- Spatial Information acquisition and quality
- Spatio Temporal Analytics

Projects and partnerships for MSc Research and internships

- World Bank Caribbean
- UN HABITAT
- NASA Centre Bangkok
- WWF
- Dutch Government
- IRDR
- ICIMOD
Etc.
4. WHAT IS THERE AFTER YOU FINISH?

PROFILE SPATIAL ENGINEER

✓ MULTI DISCIPLINARY:
   GEO-TECHNICAL, CIVIL ENGINEERING (WATER)
   GEOGRAPHICAL INFORMATION SYSTEMS; DATA-MANAGEMENT, PROGRAMMING, VISUALIZING
   SPATIAL PLANNING AND GOVERNANCE (STAKEHOLDER INVOLVEMENT)

✓ ENGLISH & DUTCH LANGUAGES

✓ EXPERIENCE IN INTERNATIONAL PROJECTS AND TEAMS

✓ RESEARCH SKILLS

✓ ENTREPRENEURIAL AND PROACTIVE

✓ COMMUNICATION SKILLS

✓ ACADEMIC LEVEL
4. WHAT IS THERE AFTER YOU FINISH?

JOBS:
- PROJECT MANAGER
- RISK MANAGER
- SCIENTIFIC RESEARCHER
- CONSULTANT

IN: HYDROLOGY, SUSTAINABLE DEVELOPMENT, NATURAL RESOURCES MANAGEMENT, DISASTER RISK, FOOD & WATER SECURITY
5. NEXT STEP(S)

- ASK QUESTIONS NOW OR LATER!
- VISIT WEBSITE: UTWENTE.NL/GO/SE
- ALSO FOR ADMISSION & REGISTRATION
- MORE QUESTIONS: EDUCATION-ITC@UTWENTE.NL