Spatial Engineering

UNIVERSITY OF TWENTE. ITC

Croho: nog toe te kennen

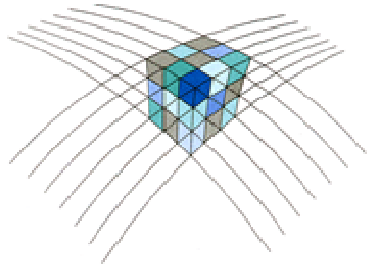
OLD: Victor Jetten

Onderwijsdecaan: Jaap Zevenbergen

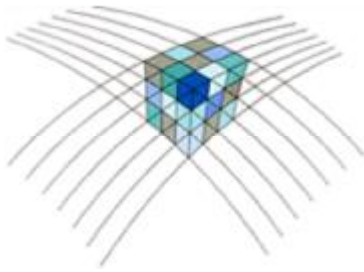
NCG MSc GI Onderwijsbijeenkomst
17 april 2018, Fugro Leidschendam

NCG

Nederlands Centrum voor Geodesie en Geo-informatica (NCG)



Final Qualifications



FQ1 – Integrated knowledge development in the three knowledge fields: TE, SIS, SPG

FQ2 – Research in a purposeful and methodological way

FQ3 – Design interventions for sustainable development

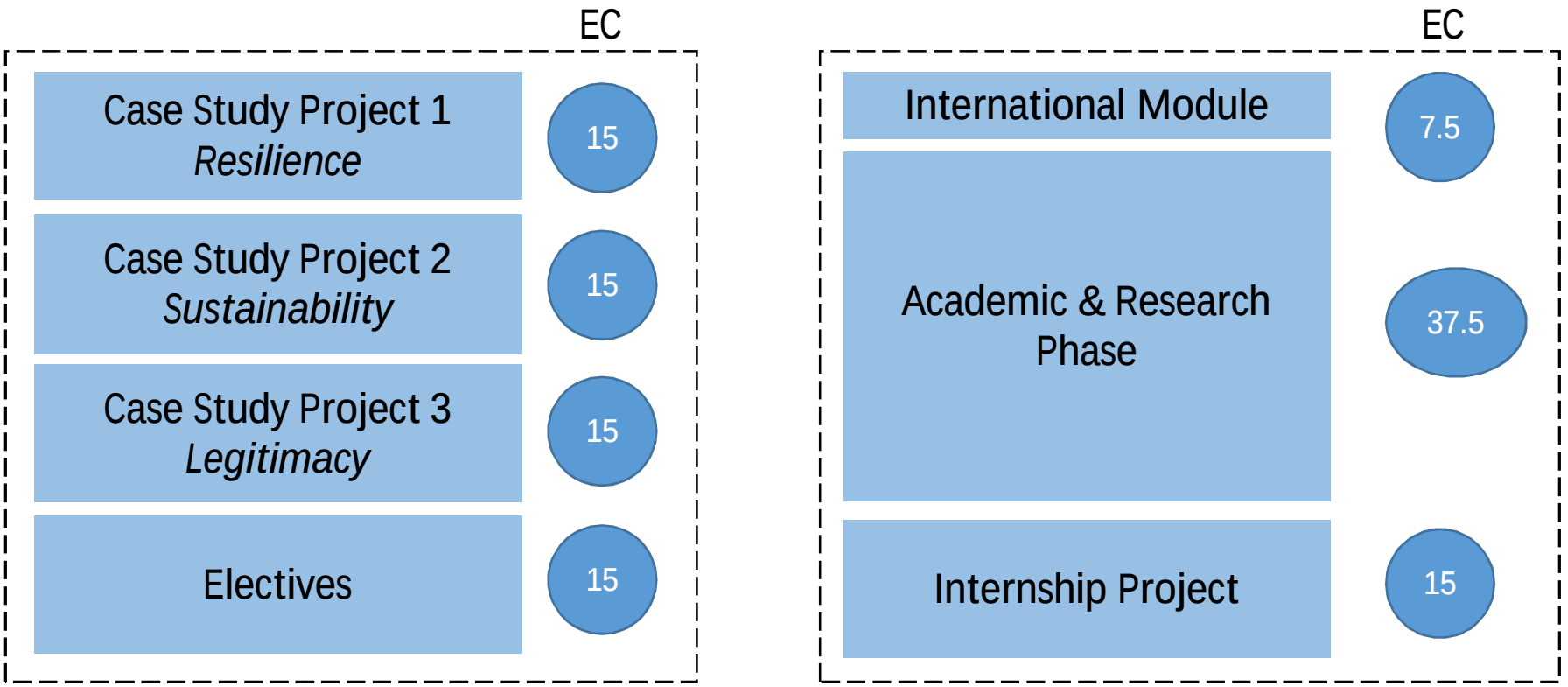
FQ4 – An academic approach to the development, justified use and validation of theories and models

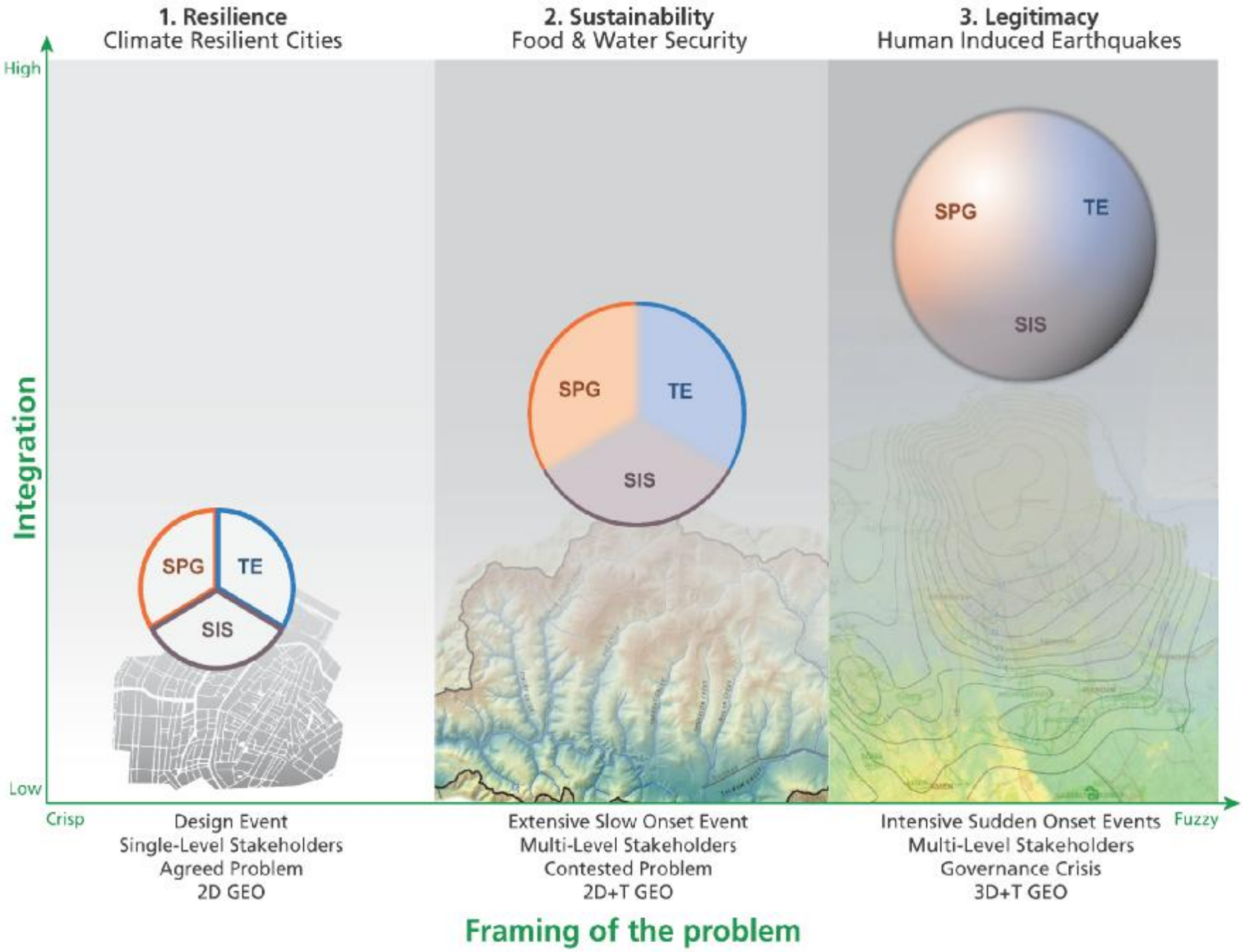
FQ5 – Competence in reasoning, reflection and judgement

FQ6 – Competence in cooperation and communication

FQ7 – Work internationally as a global citizen and as an empathic engineer

1. Structuur opleiding

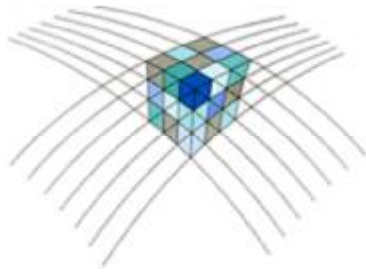



1. Resilience
Climate Resilient Cities
2. Sustainability
Food & Water Security
3. Legitimacy
Human Induced Earthquakes
High
Integration
Low
SPG
TE
SIS
SPG
TE
SIS
SPG
TE
SIS
Crisp
Design Event
Single-Level Stakeholders
Agreed Problem
2D GEO
Extensive Slow Onset Event
Multi-Level Stakeholders
Contested Problem
2D+T GEO
Intensive Sudden Onset Events
Multi-Level Stakeholders
Governance Crisis
3D+T GEO
Fuzzy
Framing of the problem

Master's programme Spatial Engineering

Content case study projects

	Project content	Technical Engineering (TE)	Spatial Information Science (SIS)	Spatial Planning & Governance (SPG)
Case study project 1	**Urban flood problem** • Stakeholder analysis • Water Vision **Engineering interventions** • Functional design • Quantify impact • Assess feasability	**Hydrologic engineering** • Urban hydrology & Flood modelling • Rain monitoring & calibration/validation • Probability & Frequency analysis	**Risk mapping** • Laser scanning & data acquisition (e.g.UAVs) • Catchment delineation from DEMs • Cartographic design • Base maps & thematic maps	**Flexible planning approach** • Climate change & Social vulnerability • Integrated urban water management • Urban growth model
Case study project 2	**Catchment management** • Food and water security • Multi-level stakeholder diversity • Scenario analysis and evaluation • Design of an intervention	**Food production systems** • Ecosystem analysis • Dynamic modelling	**Earth Observation** • Remote sensing • Image classification • Spatial statistics • Vegetation mapping and monitoring	**Dynamic planning approach** • Stakeholder identification • Markets and value chain analysis • Evidence based policy analysis
Case study project 3	**Problem and stakeholder analysis** • Primary data acquisition via fieldwork • Technical analysis and reporting of earthquake hazard and risks • Documentation for general public	**Seismic hazards** • Structural vulnerability of the built environment • Seismic hazard above gas reservoirs • Geology	**Big geodata** • 3D/Temporal & collaborative visualizations • Crowdsourcing and citizen science • InSAR for land surface displacement	**Learning planning approach** • Spatial knowledge management • Rights and restrictions in the built environment



3. Kentallen

Aim: 50% EU, 50% non-EU

To allow students to meet the final qualifications of the Spatial Engineering programme it is necessary that incoming students have knowledge at bachelors level of a research university in at least three of the following topics:

- Water, weather and climate (hydrology, meteorology)
- Earth sciences (geo-engineering, geology, earth surface processes)
- Civil engineering (infrastructure, building, hydraulics, hard interventions)
- Spatial planning and governance (urban and or rural environments)
- Spatial information and visualization (GIS, Remote Sensing)
- Software engineering

4. Uniek

"IT IS A DARING MASTER'S PROGRAMME. IT PROMISES TO DELIVER THE ITC-STYLE REFLECTIVE ENGINEERING PRACTITIONER OF THE FUTURE WHO CAN INTEGRATE TECHNICAL ENGINEERING, SPATIAL INFORMATION SYSTEMS, AND PLANNING AND GOVERNANCE KNOWLEDGE AND KNOW-HOW IN THE REAL-WORLD OF WICKEDLY COMPLEX PROBLEMS WE INCREASINGLY FACE."

David E. Goldberg, Professor Emeritus Entrepreneurial Engineering, department of Industrial and Enterprise Systems Engineering (IESE), University of Illinois (USA)

5. Visitatie TNO 2018

Standard	Assessment
Intended Learning outcomes *Standard 1 : The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements*	Meets the standard
Teaching-learning environment *Standard 2 : The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.*	Meets the standard
Student assessment *Standard 3: The programme has an adequate system of student assessment in place.*	Meets the standard
Conclusion	Positive

6. Toekomst