

	ROYAL GEOLOGICAL AND MINING SOCIETY OF THE NETHERLANDS	Number: NVC1 Version: 1 Date: 2 April 2014
	EurGeol NVC Regulations	Approval Authority
	Recognition of Dutch earth science training programmes for EurGeol accreditation	KNGMG board

1 OBJECTIVE

To establish who is eligible for the EurGeol title in the Netherlands, based on their education and degree.

2 SCOPE

Regulation NVC1 covers the actions of the Dutch National Vetting Committee for the EurGeol title when assessing earth scientists trained in the Netherlands. It does not cover work experience.

3 RELATED REGULATIONS

- EFG Regulation E1: Criteria for award of title of European Geologist

4 CRITERIA

4.1 European geologist qualifications

With regard to training and experience, EFG Regulation E1 states that applicants qualify for the title of European Geologist if they:

- hold a recognised degree or equivalent qualification in geology or related subject;
- demonstrate the abilities to:
 - understand the complexities of geology and of geological processes in space and time in relation to their speciality;
 - use geoscience information to generate predictive models.

Current specialisations by which EurGeols can identify themselves in the online EurGeol register are: CO₂ geological storage, education, engineering geology, geological heritage, geothermal energy, hydrogeology, manager, minerals, natural hazards, oil & gas, palaeontology, petrology, sedimentology and soil.

This all implies that geology is broadly defined in the context of EurGeol accreditation but it does, however, not correspond to the field of earth sciences in its entirety, at least not to how it is defined in the Netherlands. This definition is so broad, including for instance atmospheric and life sciences, that it can be hard to straightforwardly establish eligibility of Dutch EurGeol candidates on the basis of their degree or training alone. The holder of a degree in “earth system science”, for example, does not necessarily qualify as the focus may have been on climatology. In contrast, Dutch geohydrologists may hold a degree in agricultural engineering.

The present regulation therefore indicates which current and past Dutch training programmes are recognised as admissible for EurGeol accreditation (some conditionally), meeting the requirement in EFG Regulation E1 for National Associations to publish such criteria.

4.2 Earth sciences in the Netherlands

In the Netherlands, the field of earth sciences is defined in a Domain-Specific Reference Framework, issued by the Chamber for Earth Sciences of VSNU¹ for higher education accreditation purposes:

“Earth Sciences have the planet Earth as their object of study, its genesis and its quality of life. Knowledge is gathered about its origin, its current and former composition, structure, and the processes acting in and between the components geosphere, hydrosphere, atmosphere and biosphere. Equally important is knowledge of how to manage and sustainably use Earth’s resources and understand the influence of human activity on the terrestrial system. It is of vital importance to gain insight into the wide range of time and spatial scales on which earth processes operate and are manifest. The study of Earth Sciences combines aspects of observation in different forms, via remote-sensing (air and land surface), field studies (surface/outcrop observations and measurements), measurements from within the Earth (e.g. seismology, earth material), analysis of data using laboratory methodology and techniques, and through developing and testing of concepts via computational modelling and simulations.”

The Domain-Specific Reference Framework distinguishes between four earth-science domains: the geosphere, surface, hydrosphere/atmosphere/biosphere, and applied earth sciences. The array of (sub)disciplines associated with each domain ranges from geology, geochemistry and geophysics to climatology, landscape ecology and atmospheric chemistry. The extent to which practitioners of these disciplines are expected to meet the two fundamental scientific criteria that an EurGeol should be able to demonstrate (i.e. understanding geological processes and being able to use them in predictive models) is indicated in Table 1.

4.3 Dutch earth science training programmes

Earth science disciplines and sub-disciplines largely do not correspond one-to-one with Dutch earth science training programmes, especially not with the current ones. Instead, they appear in ‘programme tracks’, as annotations on diplomas or are expressed in the subject of theses. Table 2 shows programmes in Earth Sciences which have relevant disciplines of Table 1 in their core, and indicates whether degree holders of these programmes are eligible or conditionally eligible for the EurGeol title².

Conditionally eligible implies a case by case evaluation by the National Vetting Committee, matching the curriculum with the above general requirements.

4.4 The admissibility of Bachelors

Since the ratification of the Bologna Declaration by the Netherlands, Dutch universities issue bachelor and master degrees. The master degree is equivalent to the pre-existing degrees of

¹ Association of Universities in the Netherlands.

² All Dutch education directors that have earth science programmes in their portfolio have been consulted.

doctorandus (drs.) and *ingenieur* (ir.); there is no such recent equivalent for bachelors³. Dutch university bachelor programmes take three years to complete, after which students may enrol in a master programme that takes one to two years to complete. A Dutch BSc degree is a formally recognised academic qualification, but it will have taken less training than the standard of four years mentioned in EFG regulation E1. Altogether, the Dutch NVC committee will consider applications of bachelors in earth sciences, but with a minimum work experience of six years instead of the four years mentioned in EFG Regulation E1.

Other than universities, the Dutch higher education system includes the *hogeschool*, which literally translates to high school, but is internationally referred to as ‘university of applied science’. A *hogeschool* differs from a university in the sense that it does not conduct research and offers vocational rather than academic training. Since the ratification of the Bologna Declaration, completion of a *hogeschool* programme, which takes four years, is rewarded with a bachelor degree. However, even though *hogeschool* civil and environmental engineering or agriculture curricula may include earth-scientific courses, *hogeschool* Bachelors are not eligible for the EurGeol title.

4.5 Non-Dutch earth-science training

Non-Dutch earth science curricula will be assessed on a case-by-case basis, when necessary consulting the national association of the country where the applicant obtained his/her diploma. If the value of the degree cannot be assessed by the NVC, it may consult Nuffic, the Netherlands organisation for international cooperation in higher education. Nuffic offers the assessment of foreign diplomas as a service, the costs of which rest with the applicant. Nuffic is also able to establish the authenticity of diplomas (see regulation NVC2).

³ Until the early 1980s, the title of *Kandidaat* (candidate) was awarded to students after having passed the *Kandidaats* exam, which took place in more or less the stage in their studies as the current Bachelor examination. However, the degree of *Kandidaat* was never considered a full academic or professional qualification, and accordingly a *Kandidaat* is not eligible for the EurGeol title.

Table 1. Matrix showing the field of earth sciences as it is formally defined in the Netherlands, associated disciplines and sub-disciplines, and the extent to which their practitioners are eligible for the EurGeol title.

		practitioners of (sub) disciplines in principle eligible as EurGeol?		
		yes	Possibly	No
Earth System Domains, and related Earth Science (sub) disciplines	Geosphere	<ul style="list-style-type: none"> • geology • geochemistry • geophysics • isotope geochemistry • tectonics • structural geology • seismology • sedimentology • paleomagnetism • petrology • volcanology 	<ul style="list-style-type: none"> • experimental materials science and deformation 	<ul style="list-style-type: none"> • thermodynamics
	Surface	<ul style="list-style-type: none"> • soil science • physical geography • geology • sedimentology • quaternary geology • geomorphology • hydrogeology • biogeochemistry 	<ul style="list-style-type: none"> • hydrology • soil chemistry and physics • hydrodynamics • soil and microbiology • geoinformatics • geostatistics 	<ul style="list-style-type: none"> • ecohydrology • landscape ecology
	Bio / hydro / atmosphere	<ul style="list-style-type: none"> • biogeology • hydrogeology • geobiochemistry • palaeontology • palaeoceanography 	<ul style="list-style-type: none"> • physics and soil physics • marine sciences • geoinformatics 	<ul style="list-style-type: none"> • meteorology • air quality / atmospheric chemistry • climatology • hydraulics • environmental hydrology • landscape ecology • ecology
	applied earth sciences	<ul style="list-style-type: none"> • applied geophysics • petroleum engineering • reservoir geology • geo-engineering, • resource engineering 		

Table 2. Degrees from Dutch earth science BSc and MSc programmes that are admissible for EurGeol accreditation (current and discontinued programmes).

UU = Utrecht University, VU = VU University Amsterdam, UvA = University of Amsterdam, TU Delft = Delft University of Technology, WUR = Wageningen University and Research Centre, ITC = University of Twente, Faculty of Geo-information Science and Earth Observation, LU = Leiden University. Drs. = doctorandus, a Dutch academic title equivalent to MSc, ir. = ingenieur (engineer), a Dutch academic title issued by technical universities equivalent to MSc.

BSc / MSc programme	Degrees / titles ^(a)	University	Eligible?
Applied earth sciences (Technische aardwetenschappen)	BSc, MSc/ir. (PhD)	TU Delft	Yes
Applied Geophysics	MSc (PhD)	TU Delft (with RWTH Aachen & ETH Zürich)	Yes
Biogeology (Biogeologie)	MSc/drs. (PhD)	UU	
Earth sciences (Aardwetenschappen)	BSc, MSc/drs. (PhD)	UU, VU, UvA	Yes
Earth Structure and Dynamics	MSc/drs. (PhD)	UU	Yes
Earth, Life and Climate	MSc/drs. (PhD)	UU	Yes
Earth Surface and Water	MSc/drs. (PhD)	UU	Yes
Geology (Geologie)	MSc/drs. (PhD)	UU, VU, LU	Yes
Geosciences of basins and lithosphere	MSc/drs. (PhD)	VU	Yes
Geophysics (Geophysica)	MSc/drs. (PhD)	UU	Yes
Geochemistry (Geochemie)	MSc/drs. (PhD)	UU	Yes
Mining and petroleum engineering (Mijnbouwkunde en petroleumwinning)	MSc/ir. (PhD)	TU Delft	Yes
Palaeoclimatology and geo-ecosystems	MSc/drs. (PhD)	VU	Yes
Physical geography (Fysische geografie)	MSc/drs. (PhD)	UU, VU, UvA	Yes
Soil science (Bodemkunde)	MSc/ir. (PhD)	WUR	Yes
Agricultural engineering (cultuurtechniek)	MSc/ir. (PhD)	WUR	Conditionally ^(b)
Applied earth sciences	MSc (PhD)	ITC	Conditionally ^(c)
Civil engineering	MSc/ir. (PhD)	TU Delft	Conditionally ^(d)
Earth system science	MSc/ir. (PhD)	WUR	Conditionally ^(e)
Earth and environment	MSc/ir. (PhD)	WUR	Conditionally ^(e)
Future planet studies	BSc	UvA	Conditionally ^(e)
Geoinformation science and earth observation	MSc/ir. (PhD)	ITC	Conditionally ^(f)
Geomatics	MSc/ir. (PhD)	TU Delft	Conditionally ^(e)
Hydrology (Hydrologie)	MSc/drs. (PhD)	UU, VU, UvA	Conditionally ^(e)
Soil, water and atmosphere (Bodem, water en atmosfeer)	BSc	WUR	Conditionally ^(e)
Soil, water, atmosphere (Bodem, water, atmosfeer)	BSc	WUR	Conditionally ^(e)
Earth and economics (Aarde en economie)	BSc, MSc (PhD)	VU	Conditionally ^(e)
Milieuwetenschappen / aardwetenschappen	MSc/drs. (PhD)	VU	Conditionally ^(e)

^(a) The programmes listed do not include PhD studies. Where PhD degree is indicated (between brackets, only after MSc programmes), this either implies a PhD study that builds on the MSc programme, or it refers more generally to the field of science that the programme represents (e.g. a PhD in hydrology).

^(b) With special reference to its geohydrology specialisation

^(c) With special reference to its Earth resources exploration and Engineering geology specialisations

^(d) With special reference to its Geo-engineering specialisation. BSc are excluded.

^(e) Depending on the assessment of the overall curriculum, see text for explanation.

^(f) With special reference to its Geological remote sensing domain