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Where there is little data: How to estimate design variables in poorly gauged basins

IHE Delft Institute for Water Education

Certificate / Diploma Short course Delft

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Course description

Qualification Certificate

Field of study Engineering

Course summary This course addresses the estimate of hydrological variable in poorly gauged basins by means of recently developed techniques, new data sources and supported by open source software.

Course description The estimate of design variables, for hydraulic engineering and water management purposes, is a difficult task that practitioners have to face when designing a hydraulic structure, assessing water allocation, addressing river basin planning, managing water resources. This estimate is affected by several sources of uncertainties, the most crucial being the availability and reliability of observed data. This is particularly true when river basins are poorly gauged and the hydrological information observed by measuring stations is limited. Nowadays, several new sources of data acquisition are made available by the recent applications of remote sensing techniques and geophysical information systems to hydrological processes; furthermore, the scientific literature has provided practitioners with new methods and tools to best exploit available (although scarce) measured data at a given station and extend the local information to a larger scale. This course on "Where there is little data: how to estimate design variables in poorly gauged basins" aims at providing theoretical understanding and practical methods to cope with the estimate of hydrological variables in poorly gauged basins.

Study 1. New sources of data collection: GIS and remote sensing 2. Introduction to R package 3. Hydrological variables: annual flows, flow duration curves, hydrological extremes 4.



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| subjects | Techniques: Geostatistics (Example of Topkriging), Index Value Methods (Example of regional analysis), Rainfall-Runoff models (Example of models) 5. Case studies analysis |
| Course objectives | To become familiar with new and open software tools and data-sources (open-GIS, remote-sensing data) for deriving geomorphological and climatic information To have a theoretical understanding of selected hydrological variables: flow duration curves, hydrological extremes, mean annual flow To be able to apply different methods for estimating hydrological variables in poorly gauged basins |
| ECTS credits | 0.00 |
| Duration | 2 week(s) full-time |
| Language of instruction | English |
| Instruction modes | case study, computer exercise, design project, group discussion, lecture |
| Accreditation | - |

About the institution

Department IHE Delft

Information about the institution IHE Delft Institute for Water Education is the largest international graduate water education facility in the world and the only institution in the UN system to confer accredited MSc degrees and promote PhDs. It offers degree programmes, short courses, online courses and tailor-made training. Since 1957 the Institute has provided graduate education to more than 15,000 water professionals from over 160 countries. More than 175 PhD candidates were promoted. IHE Delft is at the centre of a vast international network of water related institutions, and functions as an interface between knowledge networks and centres, public and private sector organizations, scientific and professional associations and other members of the international water community. The Institute runs a substantial number of joint MSc programmes implemented in partnership with universities around the globe. These joint programmes combine the strengths of the collaborating institutions and deliver either multiple degrees or a joint degree.

Admission

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| Admission requirements | <ol style="list-style-type: none"> 1. Several years of relevant working experience 2. Relevant wo bachelor (academic bachelor). BSc degree or equivalent qualification in a relevant field from a recognised university |
| Language requirements | <p>IELTS overall band 6</p> <p>TOEFL internet based 87</p> <p>TOEFL paper based 999</p> |
| Professional experience required | - |
| | 2 week(s) |



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|-----------------------|-------------------|------------------------|----------------------------|
| Duration | full-time | | |
| Application deadlines | Start date | EU/EEA Students | Non-EU/EEA students |
| | | 26 Oct 2020 | 26 Sep 2020 |
| | | 25 Oct 2021 | 25 Sep 2021 |
| | Year | EU/EEA | Non-EU/EEA |
| | | 2020 (FT) | € 1940 |
| | | € 1940 | n.a. |

In short, the following rules apply:

- | | |
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| Tuition fees | <ul style="list-style-type: none"> • The "EU/EEA rate" is the regular fee for students from within the EU/EEA. • The "non-EU/EEA rate" is the rate for students from outside the EU/EEA. • The "institutional rate" is for all students who have already obtained a bachelor's or master's degree and who want to start a second programme leading to a degree at the same level or at a lower level. • Note that FT, PT and D stand for "full-time", "part-time" and "dual", respectively. |
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Make sure you contact your institution to find out what rate applies to you. The rates listed here are estimates.

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| Scholarships | Orange Knowledge Programmes (OKP), MENA Scholarship Programme , Netherlands Fellowship Programmes (NFP) |
| | For more scholarships, visit: www.grantfinder.nl |

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| Course website | More information about the course |
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Contact

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IHE Delft

Contact information for the institution

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Telephone number

Course website

Institution website

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