5 – 7 November 2024 in Rostock-Warnemünde

HYDRO 2024 Hydrographic Conference

LESSONS LEARNED FROM THE ENHANCED BELGIAN E-LEARNING-ORIENTED IBSC CERTIFIED “HYDROGRAPHIC SURVEYING CAT. B” PROGRAM

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Outline

Hydrographic Surveying education in Belgium
- Why ?
- Where ?

Format of the cat.B program in Belgium
- Theory
- Fieldwork
- Quality assessment
- International Cooperation
- Entry requirements

Conclusion: lessons learned

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WHY STARTING IN 2012 WITH HYDROGRAPHIC EDUCATION IN BELGIUM ?

Before 2012 there was no hydrographic education in Belgium. Most belgian surveyors are engineers or land surveyors (“Master of Science in Geomatics and Surveying”, “Master of Science in Land Survey Engineering Technology”…) without IHO cat.A/cat.B accreditation.

Usually these surveyors received an additional “on the field” training by their employers (mainly 2 big dredging companies DEME and JAN DE NUL).

For the moment there are more than 500 hydrographic surveyors working for Belgian Companies or hydrographic offices, almost all without IHO/IBSC accreditation.

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Why ?

HPAS !

HPAS CORNER – IFHS
(hydrography.earth/hpas)

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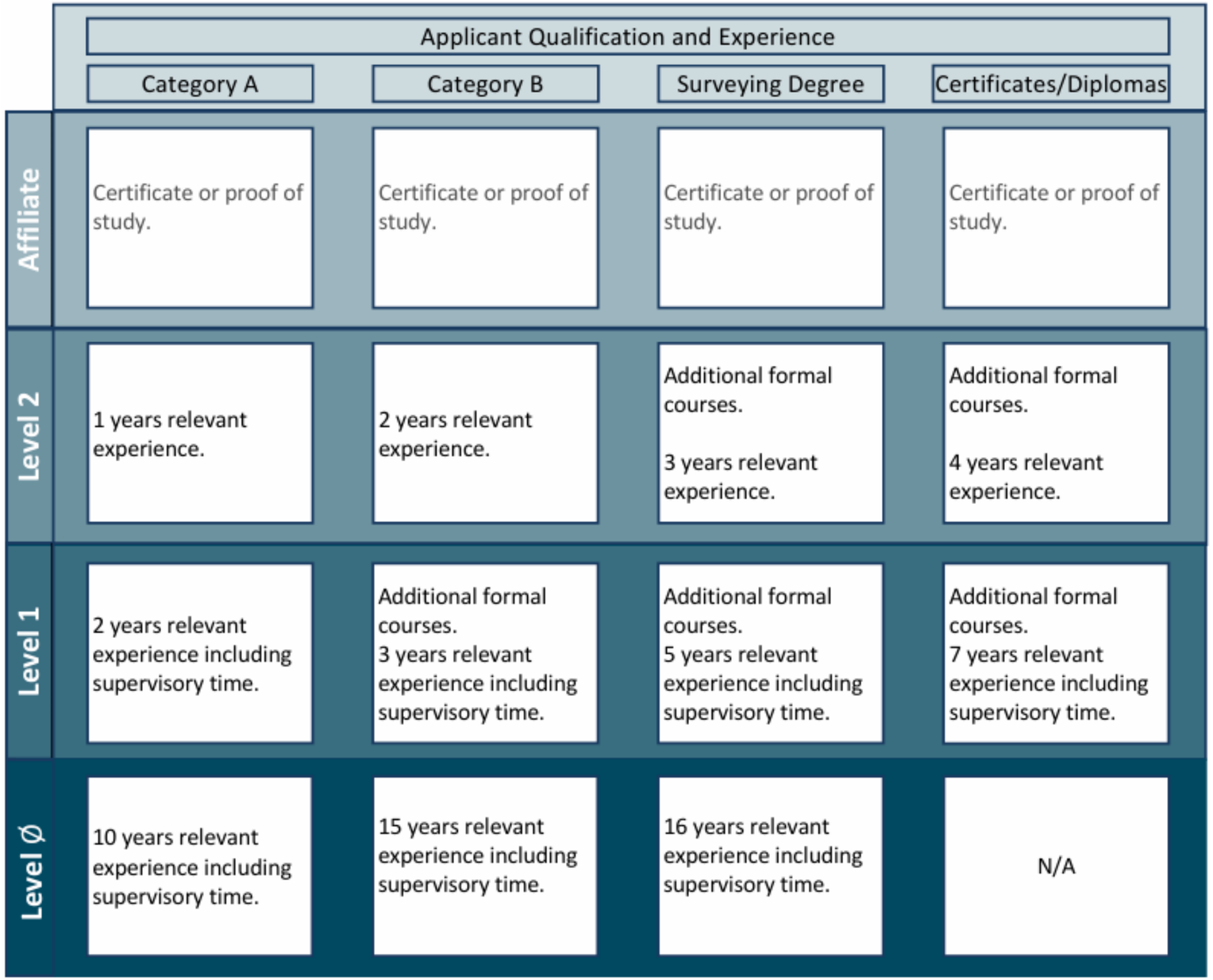
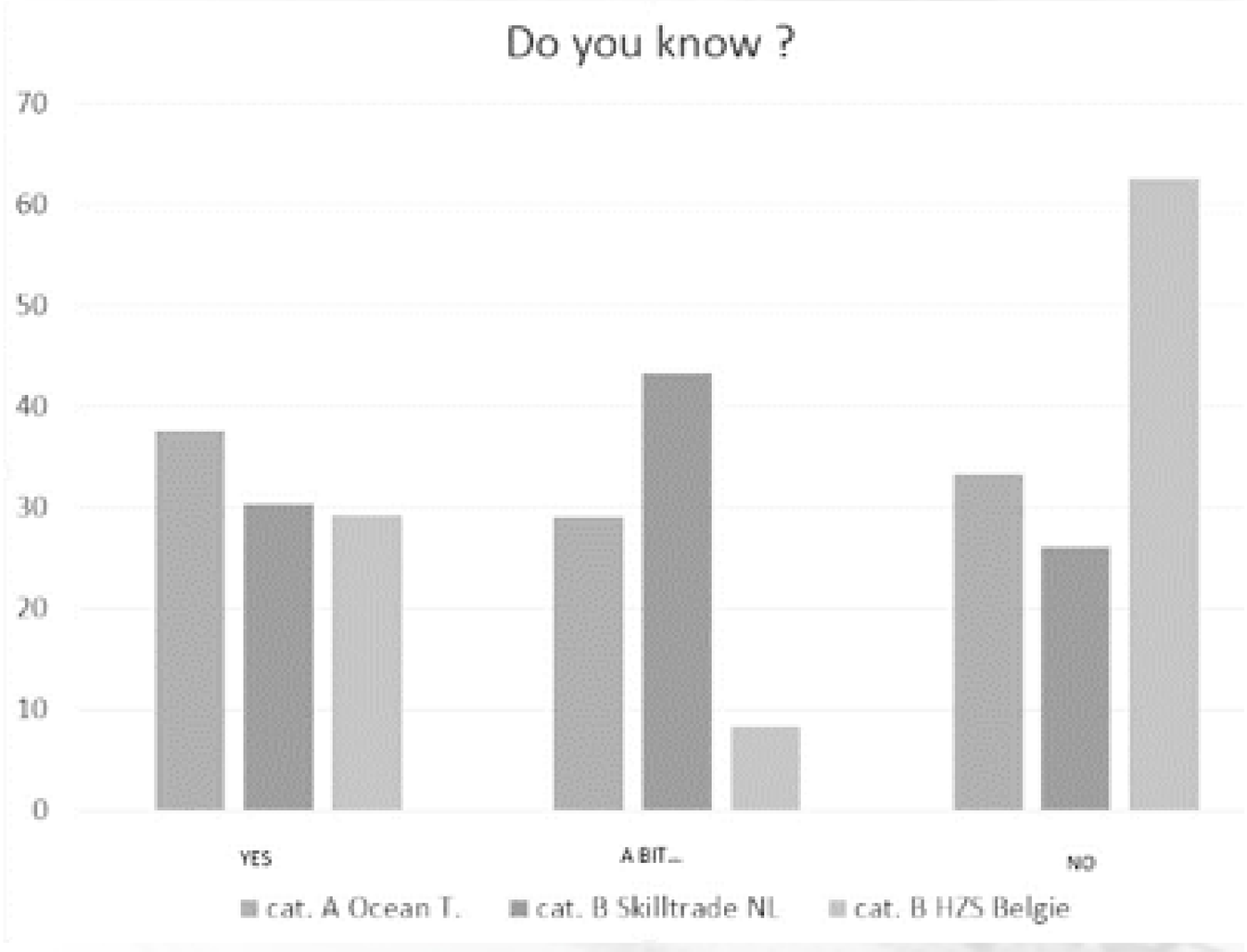


	Applicant Qualification and Experience			
	Category A	Category B	Surveying Degree	Certificates/Diplomas
Affiliate	Certificate or proof of study.	Certificate or proof of study.	Certificate or proof of study.	Certificate or proof of study.
Level 2	1 years relevant experience.	2 years relevant experience.	Additional formal courses. 3 years relevant experience.	Additional formal courses. 4 years relevant experience.
Level 1	2 years relevant experience including supervisory time.	Additional formal courses. 3 years relevant experience including supervisory time.	Additional formal courses. 5 years relevant experience including supervisory time.	Additional formal courses. 7 years relevant experience including supervisory time.
Level Ø	10 years relevant experience including supervisory time.	15 years relevant experience including supervisory time.	16 years relevant experience including supervisory time.	N/A

Hydrographic Education in the Benelux

- A "IHO cat. A hydrography" offered by the "Maritime Institute Willem Barentsz" (Terschelling, the Netherlands);
- A "IHO cat. B hydrography" offered by the private company "Skilltrade" (the Netherlands);
- A "IHO cat. B hydrography" offered by the "Antwerp Maritime Academy (Antwerpen, Belgium), together with Ghent University.



Outside Benelux: Cat. A in Hafencity University Hamburg (Germany) and ENSTA Brest (France)

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HISTORY OF THE ESTABLISHMENT OF THE BELGIAN CAT. B PROGRAMME

In 2012, a partnership was formed between:

The “Institute for Hydrography” was established within the “Antwerp Maritime Academy” (ISO 9001-2008 certified and reviewed by internal and external audits (by “Det Norske Veritas”), as hosting institute of the programme.

Ghent University (> 50.000 students, > 15.000 employees).

And many partners…

AGENTSCHAP MARITIEME DIENSTVERLENING en KUST

Vlaanderen is maritiem

VLIZ

flanders HYDRAULICS RESEARCH

DEME Dredging, Environmental & Marine Engineering

GEOXYZ

DJN Jan De Nul GROUP

QPS.

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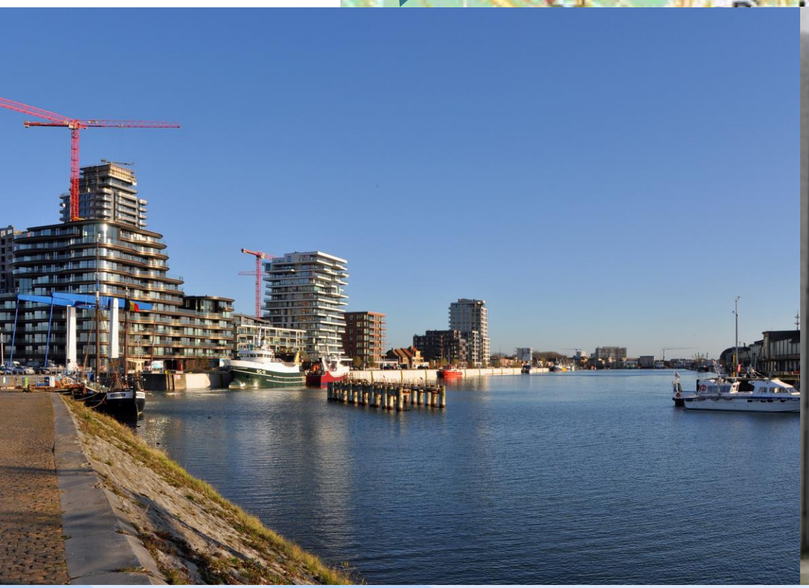
Breda
Tilburg
A2
Roosendaal
A58
Eindhoven
A67
Knokke-Heist
Blankenberge
Ostend
Bruges
A10
E19
A12
Antwerp
E34
Sint-Niklaas
Roermond
E40
E17
Ghent
FLANDERS
Roeselare
Aalst
Mechelen
Hasselt
Genk
Leuven
E40
Brussels
Ypres
A19
Kortrijk
Heerlen
Maastricht
E40
A25
Mouscron
Waterloo



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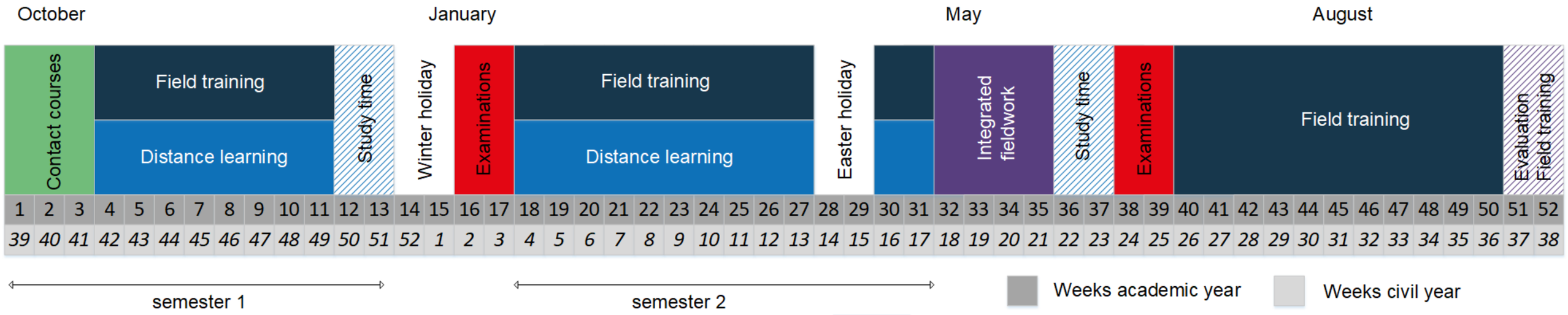
THE HYDROGRAPHY B POSTGRADUATE HAS A DURATION OF ONE CALENDAR YEAR (END SEPTEMBER – END SEPTEMBER).



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COURSES

It has a total of **60 ECTS** (European credit transfer system).

- **36 ECTS are for theoretical courses**.

- **24 ECTS are for fieldwork.**

BLENDED PROGRAM STRUCTURE

36 ECTS are for theoretical courses.

- 18 ECTS are given by the **Antwerp Maritime Academy**, 18 ECTS by **Ghent University**.

- The lecturers of the courses are all specialised in their field and affiliated not only to the Antwerp Maritime Academy or Ghent University but also to Flanders Hydraulic Research, the FlemishHydrographic Office and the hydrographic industry (Deme, Jan De Nul, GEOXYZ,…).

- **Theoretical « classroom » lectures** (3 weeks) as « introduction / basic knowledge »

- **CBT (computer-based training)** = « E-learning » using an educational internet platform for extra theory and theoretical/practical computer exercises and assignments (spread over 10+14 weeks):
  - « UFORA » from UGent
  - « Flowsparks » from AMA

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FULL PROGRAM

Course	ECTS	professor	institute
ICT	3	Haosheng Huang	UGent
Navigation	6	Axel Annaert	AMA
Safety	3	Axel Annaert	AMA
Seamanship	3	Axel Annaert	AMA
Water levels and flow	3	Yves Plancke	AMA
Geodesy and cartographic systems	3	Philippe De Maeyer	UGent
Hydrographic Surveying	6	Alain De Wulf	UGent
Data Management	3	Haosheng Huang	UGent
Geology and Geophysics	3	David Van Rooij & Vera Van Lancker	UGent
Legal Aspects	3	Gwendoline Gonsales	AMA
Fieldwork	24	Axel Annaert	
Total	**60**		

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BLENDED PROGRAM STRUCTURE

24 ECTS are for FIELDWORK, subdivided in

- **« Field training »** (720 hours = equivalent to
  - 18 weeks or 90 working days at 8hours/day and 5 days/week
  - 10 weeks or 60 working days at 12 hours/day and 6 days/week)
  - in >1 private companies (Deme, JDN, GEOxyz, Fugro Survey, etc.).

- **« Integrated fieldwork »** (4 weeks, in the month of May) including two weeks of hydrographic campaign in Ostend

- All fieldwork is recorded in a « training record book ».

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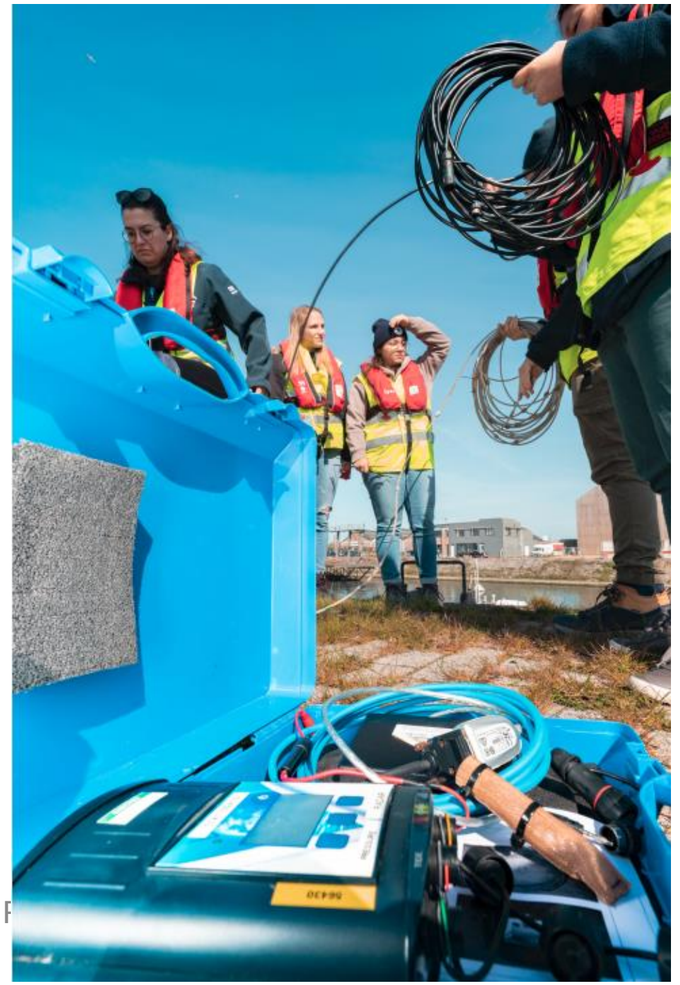
INTEGRATED FIELDWORK: 4 WEEKS IN OSTEND

Structure:

- WEEK 1: Equipment testing, visit and training on bridge and dredging simulator, visit to Flanders hydraulics, survival exercises,…



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INTEGRATED FIELDWORK: 4 WEEKS IN OSTEND

Structure:

- WEEK 2 + 3: Ostend hydrographic campaign (bathymetric acquisition)

– Training supervised by field experts from GeoXYZ, Jan De Nul, Deme, Flemish Hydrography, VLIZ,…

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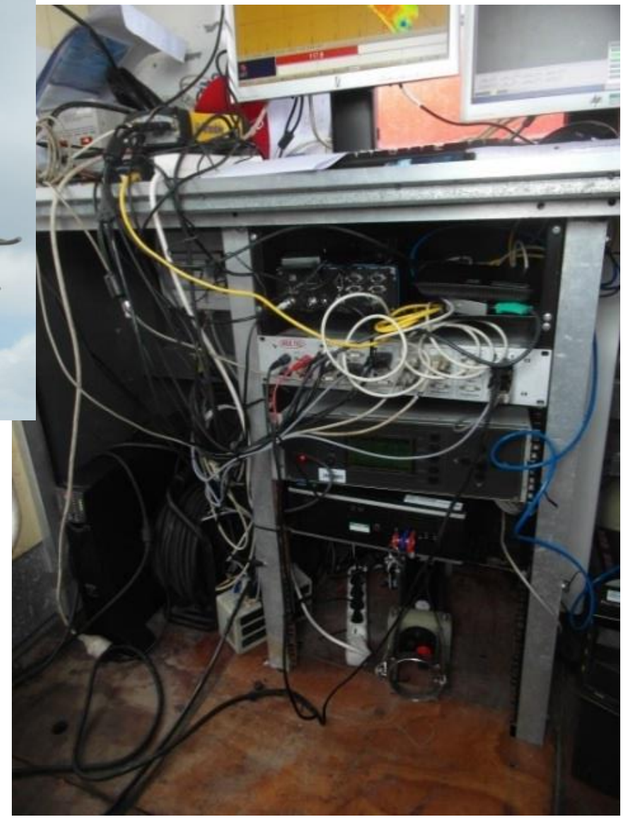
INTEGRATED FIELDWORK: 4 WEEKS IN OSTEND

Structure:

- WEEK 2 + 3: Ostend hydrographic campaign (bathymetric acquisition)

- Sensor checks
- Vessel installation
- Vessel offsets
- Vessel calibration
- Patch test
- Hydrographic survey



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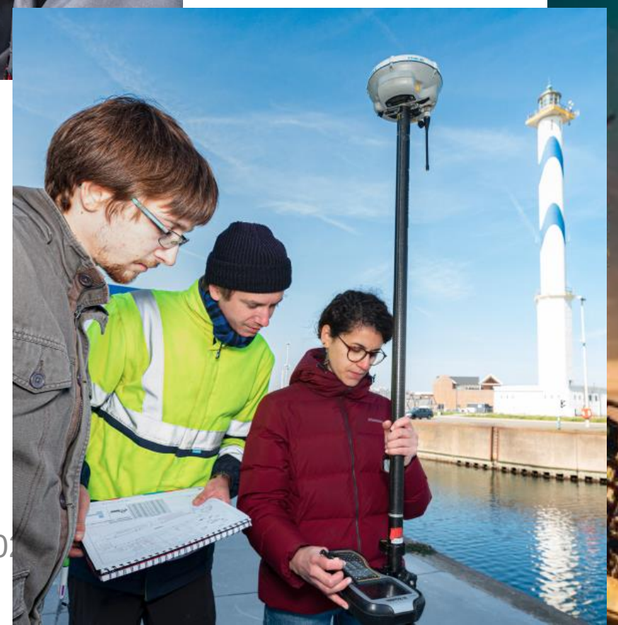

  - LiDAR
  - Photogrammetry
  - Total Station
  - Levelling
  - GNSS
  - …

– fieldwork projects as described in the Standards of Competences S-5

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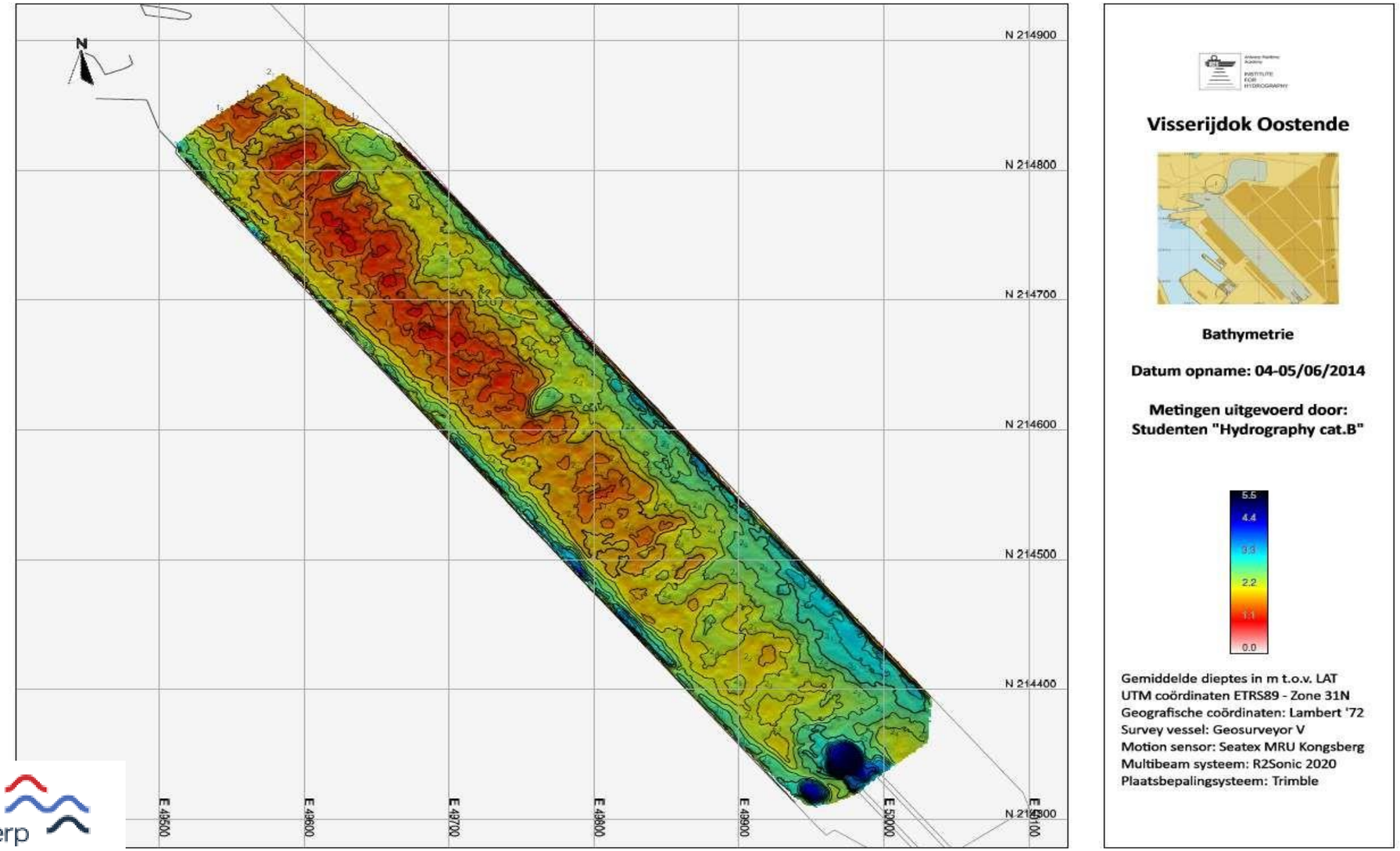
Structure:

- WEEK 4: Processing (QPS, Autoclean,…), map production, volume computation



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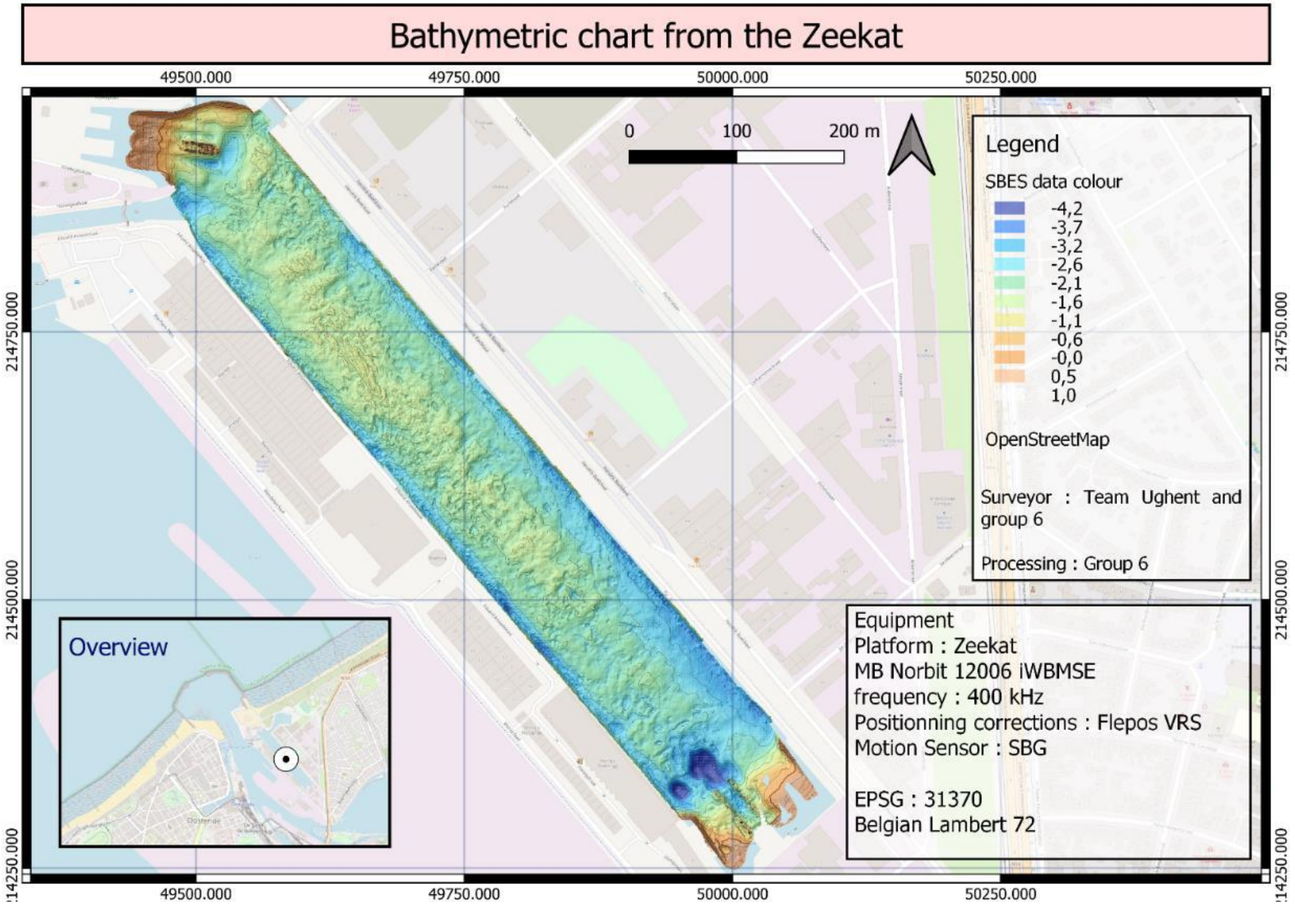

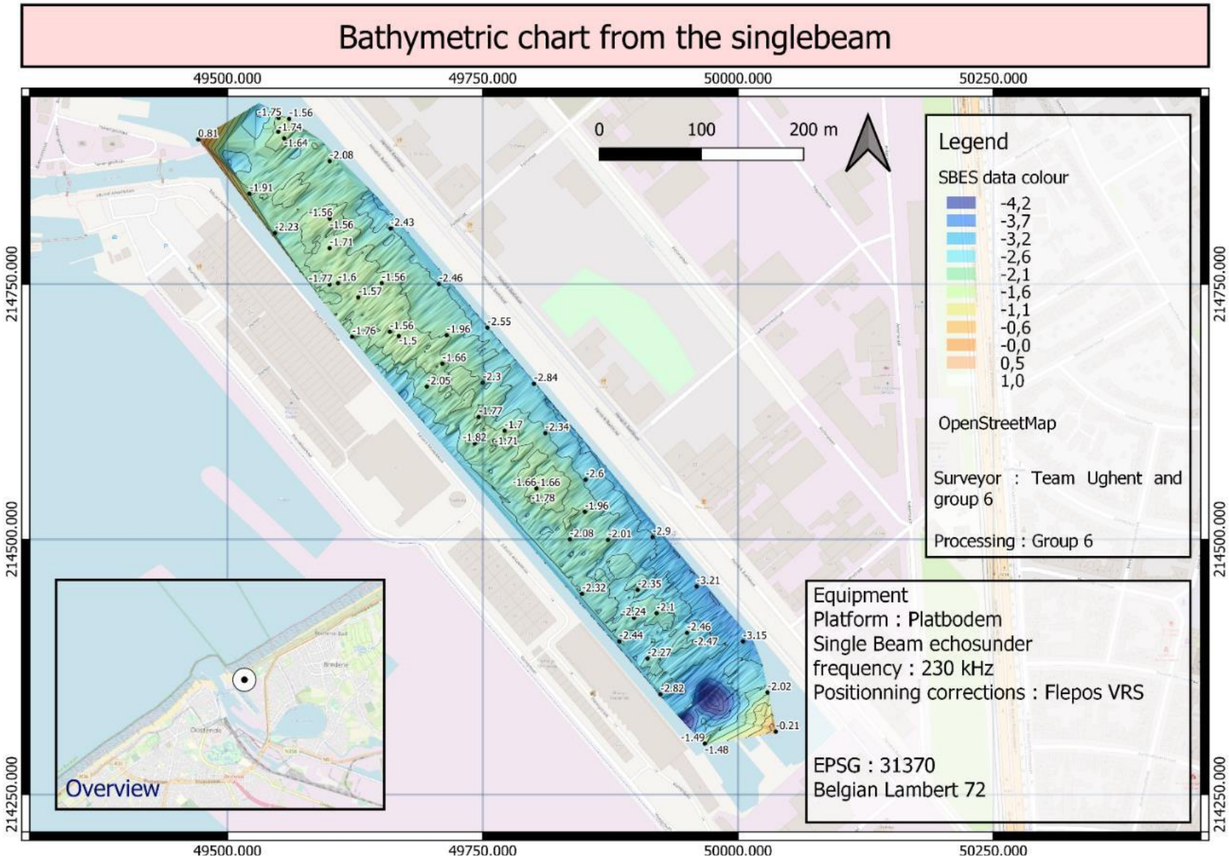

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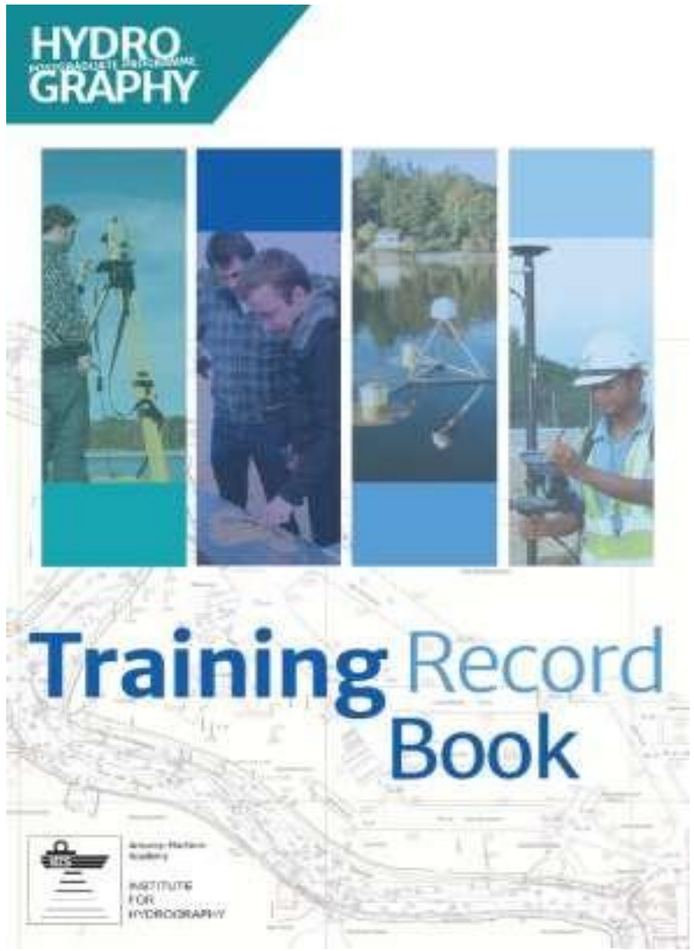
EVALUTATION OF THE FIELD TRAINING BY USING A TRAINING RECORD BOOK

EXAMPLE FROM THE 'LIST OF TRAINING TASKS AND COMPETENCES ACHIEVED'



E1	Competence: BATHYMETRY				Examination board Sign/ Date	
	Task	Supervisor's Initials/ Date		Evaluation/ remarks by supervisor		
E1.1	Underwater Acoustics					
.1	Calculate sound speed from measurements of temperature, pressure and salinity					
.2	Create a sound profile of the water column using appropriate software (indicate software on the working sheet)					
.3	[illegible] type of instrument)					
.4	Gather information about the seafloor and interpret the effects					
.5	Identify the sources of noise in the environment and use this information in your measurements					
.6	Operate transponders, pingers, acoustic releases and sound speed meters. Make a report mentioning product identification and findings					
E1.2	Single-Beam Echo sounders					
.1	Verify the mounting of transducers (hull, towed, over the side and boom)					
.2	List the transducer characteristics that affect beam width					

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OPEN TO INTERNATIONAL COOPERATION: E.G. VASSIVIERE PROJECT

- In 2012 and 2013 there was the possibility for the students to participate in an “**European Union Erasmus Intensive Program**” which aimed at providing intensive courses jointly proposed by european universities, **ENSTA Bretagne (France)**, Ghent University (Belgium) and **HCU University (Germany)**, and the CIDCO (Interdisciplinary Centre for the Development of Ocean Mapping) (Canada) and at organizing a hydrographic and topographic surveying camp.

- This project took place at the “Lake of Vassivière”, one of France’s largest artificial lakes exploited by EDF, France’s global energy company and was coordinated by Prof. Nicolas Seube (ENSTA).

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ENTRY PROCEDURE

Start of the courses: Last week of September

Brief application procedure

- **Application portfolio**
  - Send completed application portfolio with required documents to HZS-IVH
- **Registration fee**
  - Payment registration fee
- **Interview**
  - Participate in the interview
- **Tuition Fees**
  - Payment tuition fees
- **Enrolment**
  - Enrolment

Bachelor Degree

Or Equivalent from an European university or college, or from an overseas institution recognised by its government. Legalised copy of diploma.

Mathematics & Physics

Attested through recognised higher education diploma supplement. Diploma supplement should mention at least the items as specified by IHO Standards.

English language

Proficiency proven by first degree EU English language programme, TOEFL, IETS, GMAT or alternative proof.

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geography department Ghent University

Antwerp Maritime Academy
INSTITUTE FOR HYDROGRAPHY

CAT. B PROGRAMME COORDINATION: HYDROGRAPHY@HZS.BE

Global information:

https://studiekiezer.ugent.be/2024/postgraduate-hydrography-b-en

Study Guide with detailed curriculum

https://studiekiezer.ugent.be/2024/postgraduate-hydrography-b-en/programma

Entry/admission requirements:

https://studiekiezer.ugent.be/2024/postgraduate-hydrography-b-en/informeerje

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1. **Communication**
   - Blended learning & electronic platforms => steep learning curve for students and professors. An extra administrative support (50%) appeared to be needed and was engaged.

   - Feedback from the students and staff is asked each year to improve the program.

2. **Motivation**
   - A high level of self-discipline and intrinsic motivation was assumed when assignments and project work were given. This was a bit too optimistic for the significant subgroup of professional bachelor students.

   - Therefore, a strict planning with compulsory intermediate moments of feedback and assessment have been foreseen to stimulate the self-activation of the students.

3. **Organization**
   - Organizing the 4 weeks of the “integrated fieldwork” in the port of Ostend for more than 25 students with 7 partners and 5+ vessels with complex equipment/sensors involved is an enormous logistic operation. It requires a year long preparation and still a lot of flexibility in the execution. Student groups for the integrated fieldwork should be maximum 3 students (preferably).

   - A search for even more vessels is challenging as it requires more experts: USV’s are not requiring less guidance !

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thanks

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