MODEL MASTER CURRICULUM DEVELOPMENT ON SUSTAINABLE WATER MANAGEMENT

An EXCEED project outcome under the participation of 35 EXCEED partner universities

Preface

It has become an inevitable fact that global problems centering on water resources are pervasive and moreover represents an existential problem for more than 1.5 billion people. Water related problems affect political relations, public health, agriculture, development, and environment. Particularly important examples (Colwell, 2002) [1] can be related to transboundary rivers, overuse of water resources, lack of access to safe water, lack of adequate sanitary facilities, insufficient water management to reuse and to recycle industrial and municipal wastewater or increasing water needs in settings of inadequate water supply.

Long-term climate change and population growth will further stress water resources in many regions worldwide. In view of this context and to meet the 21st century's problems of academic education and skills in sustainable water management the indispensible demand is to conceptualise an integrated master curriculum across the disciplines to meet the complexity of water issues.

In 2000, the World Commission on Water stated that a holistic, systemic approach, relying on sustainable water resources management had to replace the fragmentation in managing water issues. To reach this goal, a new paradigm for interdisciplinary graduate education is urgently needed.

1. Introduction

The founding principle of a SWM graduate programme should be also to include all disciplinary perspectives relevant to water management. Water management is recognized as socio-economic, institutional, and ethical challenges as much as it is a biological, chemical, and engineering one. Thus SWM graduate programmes should be open to all relevant disciplines and be dedicated to educating people skilled in one discipline who can use multiple disciplinary perspectives and tools at the outset of the analysis of water problems. Graduate programmes must also emphasize the need for teamwork to develop solutions jointly using the rigorous methods and tools that come from the array of disciplines needed to solve such problems. While a solid grounding in one discipline is needed to participate effectively in SWM, students must also have rigorous exposure to the range of methodological tools used by different specialities.

In 2009 the Exceed project started developing an Exceed partnership network, which is currently consisting of 35 partner universities and research centers on 4 continents. Within the frame of capacity building one main focus was set on the formulation of a model master curriculum on sustainable water management. The model curriculum is used to serve as an orientation guide to adapt or refine current or future master curricula at partner universities. Though, the pre-condition was to initially develop a curriculum database (Figure 1) providing Exceed partner universities the opportunity to upload and to store detailed information about the existing master courses. Meanwhile, the database contains more than 400 master courses and is now serving as the basis for (i) providing master students with useful information, before having decided or applied for

[1] Colwell, R. (2002). ''A global thirst for safe water: The case of cholera.'' *Abel Wolman Lecture*, National Academy of Sciences, Washington, D.C., January 24.

scholarship, and moving to another Exceed partner university and (ii) serving as data pool used to carry out analyses and to develop a model master curriculum structure on sustainable water management at partner universities.

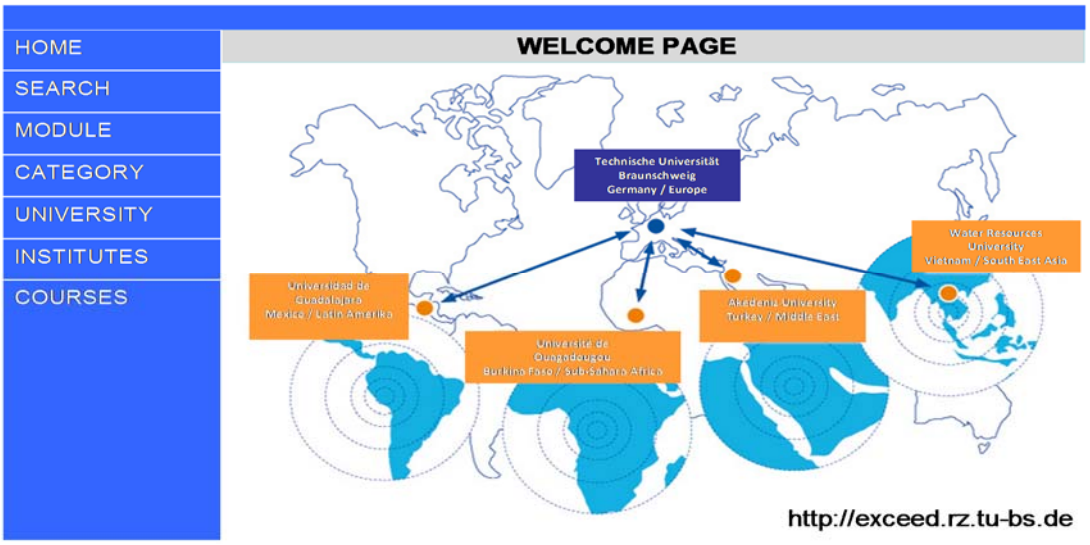

Figure 1. EXCEED curriculum database

2. Challenges

- Challenge to balance technical specialization and development of management skills

There is a large area of consistency in curriculum development of IWRM or SWM although achieving the right balance between technical specialization and development of management skills is challenging. Several different implementation modalities exist, however, it seems that the most successful approaches involve collaboration between institutions and disciplines. Further, teaching staff is asked to become more familiar with management skills besides scientific education. Relevance of management issues could be improved by increased attention to research and better engagement between the universities and water managers in administration and industry. The current observation is that capacity builders are challenging practitioners, water users, and managers to converge, learn and manage water resources together. Academics in turn are prompted to carry out research to support sustainable water management with a movement away from the traditional un-sustainable management practices. The „new water manager" has to have a combination of social/societal and technical knowledge, skills, and experiences. The remaining question is (it concerns developed and developing countries likewise) whether the system is ready to recruit these people and what the local, regional, and national demands of respectively educated academics are.

- Controversial point „Specialization versus generalization"

Merging specialist skills and knowledge with SWM as opposed to a more general focus on the broad management principles is an issue to be clarified (potentially on individual level) in the context of SWM curriculum development. It is beyond controversy that there is an urgent need for more people with traditional technical skills in developing countries which in turn may have a negative impact on the support for more generalist programs. There are still conflicting opinions whether there is a need for generalist water manager or the sector would prefer that engineers are „upgraded" with management skills.

- Challenge to fill the gaps in education

To tackle future challenges of water related issues the need of interdisciplinary graduate programs cannot be denied. Hence, very often the problem turns out to be evident that universities are usually limited to the melding of several scientific and/or technical areas. Attempts to broaden the curriculum to social sciences often result in sets of electives that are unrelated with no or minimal overlapping themes, and perhaps only marginally linked to the broader issues of SWM.

3. Model Master Curriculum on SWM

3.1 Preliminary Analysis of the Curriculum Database

After the technical database framework was set up and the respective master courses were uploaded the analyses of single course contents were carried out according to the following procedure: The course contents were analyzed to identify sub-categories and keywords related to sustainable water management. Further, these sub-categories and keywords found in the course contents were counted by numbers and finally assigned to 4 main categories. The detailed results are represented in tables in the Annex. The tables show by numbers and for every partner university the distribution of the sub-categories mentioned most frequently (dark and light blue-shaded numbers) in the course contents. Related to this tabular collocation and analysis the most frequently mentioned sub-categories were identified and assigned to the following 4 main categories:

1. Water Science & Engineering:
Hydrology, Hydraulic Engineering, Hydrogeology, Erosion & Sedimentation, Floods & Drought, Coastal Engineering, River & Coastal Morphology

2. Biological Aspects of Water, Health & Nutrition:
Ecosystem Degradation & Resilience, Water & Health, Ecology & Ecosystem Dynamics, Eco-hydrology, Eco-hydraulics, Ecosystem Valuation, Microbiological & Biochemical Aspects, Ecotoxicology.

3. Chemical Aspects of Water, Environment & Anthropogenic Aspects:
Rural Urban and Industrial Issues, Pollution Analysis, Wastewater treatment, Planning Design and Construction, Water Quality & Water Chemistry, Remediation, Chemical and Analytical Methods.

4. Water Management, Social, Political & Legal Aspects:
Water Management & Economic Aspects, Development Studies, International Water Policy between Conflict and Development.

Based on this database analysis and on group discussions during the Exceed Plenary Meeting (October 7 – 12, 2013) in Bali the Exceed network partners came up to a final agreement about the structure of a model master. Basically, the agreement includes the consolidation of the 4 main categories finally resulting in 3 main categories or “pillars”. Additionally, a coherent allocation of the sub-categories was carried out. In case of the fourth main category “Water Management, Social and Political Aspects” as a completely new “pillar” was defined. The respective results are presented in the next chapter. Parallel to the debate on the model master curriculum the establishment of the UNESCO Water Chair at Mekele University (Ethiopia) was also made a subject. All panel members finally concluded that this could be the unique opportunity to take the SWM curriculum structure as a template. However, it was also pointed out that the implementation strongly depends on the university capacities and available teaching staff. But nevertheless, the curriculum may generally serve as a starting or orientation point for improving, revising or identifying gaps related to the master education in SWM.

3.2 Agreement on the Model Master Curriculum

Within the scope of the agreement the panel members revised the preliminary analysis and emphasized that the local, national, and global complexity of water issues requires an interdisciplinary and holistic approach in graduate education and should focus on and combine engineering, natural, and social sciences. Against this background the final conceptual approach and outcome resulted in the below listed 3 main categories or pillars of SWM graduate education. It was further highlighted that course contents shall be taught applying traditional methods as well as new pedagogic approaches including internship, seminars, case studies or joint group work (project oriented education and learning).

The three pillars of the SWM curriculum are:

I. **Engineering** – This pillar consists of the following core areas of education representing hard and semi-hard technical skills:

Hydrology
Hydraulic Engineering
Hydrogeology
Ecohydraulics
Ecohydrology
Sanitary Engineering (Water / sewage sludge treatment, planning and design)
River & Coastal Engineering (Erosion and sedimentation)
Risk Analysis

II. **Natural Sciences** – This pillar includes the following core areas of education representing semi-hard scientific skills:

Ecology & Ecosystem Dynamics
Ecosystem Degradation & Resilience
Water & Health
Ecotoxicology & Limnology
Environmental Biotechnology (Treatment, remediation)
Water Quality & Chemistry
Basic Analytical Methods
Pollution Sources
Pollution Analysis (Monitoring, control)
Fate & Bahaviour of Pollutants in Ecosystems

III. **Social Sciences & Socio-Economics** – This pillar includes the following core areas providing skills in water management and socio-economics:

Water Governance
(Policy, institutions and regimes, strategies, empowerment and stakeholder participation, organizations (GO and (I)NGO), privatization, inter-agency coordination)

Water Economics
(Principles of water economics - supply and demand - and finance, pricing of water services and cost recovery, economic instruments, economic analysis, fishing, deep sea mining, transport, water power)

Sustainable Water Management and tools
(Mathematical modeling (for e.g. water allocation), pricing, water footprint (green,

blue, grey, brown) and virtual water, life cycle assessment, dynamic analysis)

Management of Transboundary Water like Lakes, Rivers, Aquifers, and Glaciers
(international water laws and treaties, conflict and cooperation, negotiation and mediation)

Legal Aspects of Water Management
(Water laws, water rights and ownership, conventions)

Socio-Cultural Aspects of Water Management
(Gender and water, religious aspects of water (e.g. reuse of wastewater), displacement and compensation, environmental awareness and education

In Figure 2, the overall percentaged proportion of advanced and introductory courses, and joint group work of the model master is given. The percentaged distribution offers the opportunity to easily adapt the workload and extent of courses to be allocated to the respective course level and group work. This structure also allows easy adaption to the available supply and potentials of the partner universities in the Exceed network. The whole structure follows the final outcome of the discussion during the plenary meeting. In accordance with this, the so-called "triple solution" was favoured, which allows undergraduates to join the master while coming from engineering, natural science, and socio-economic disciplines. For example, an undergraduate student educated in engineering disciplines has to pass introductory courses in sciences and socio-economic disciplines besides the mandatory advanced courses of engineering. Further accompanying qualification tools are joint interdisciplinary group work and seminars. The primary objective of the joint interdisciplinary group work is to integrate engineering, natural science and social science aspects by bringing together the students from the three specialization tracks. Accompanying seminars should focus on structuring and integrating methodologies, tools and techniques applied to SWM – likely by invited lecturers or experts from Exceed partner universities.

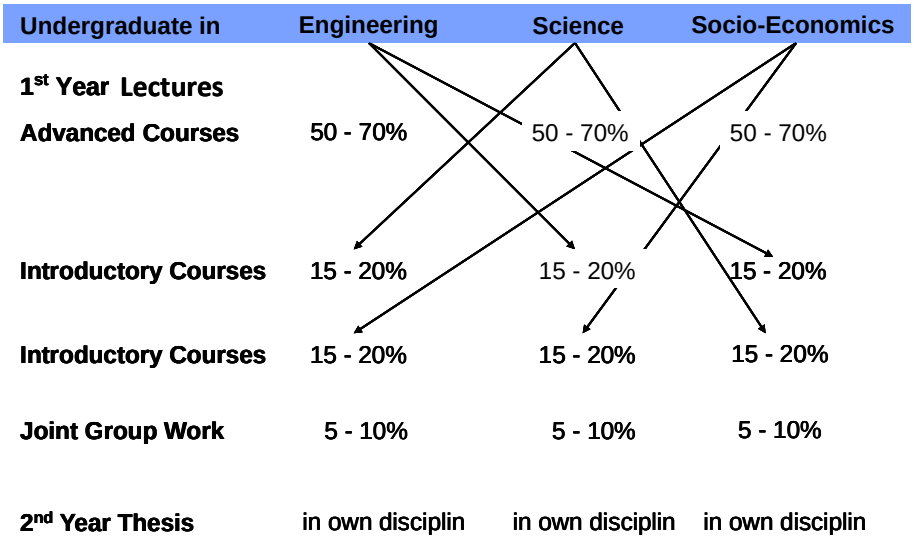

Figure 2. Percentage of courses´ distribution within the categories "advanced" and "introductory" courses, joint group work, and master thesis according to the educational focus of entering undergraduate students.

The following Figures 3a-d represent the detailed elaboration of a proposal for a model master on sustainable water management. The details of the proposal have been worked out on the basis of the Bologna agreement, which is related to the European-wide harmonization of courses for studies and degrees. Therefore the distribution of ECTS points on the basis of the Bologna agreement does not follow exactly the percentages proposed in Figure 2.

The Bologna agreement fixes and guarantees the comparability of workloads and academic degrees. Therefore, the European Credit Transfer and Accumulation System (ECTS) has been introduced. Related to this system the workload for master studies comprehends a maximum number of 120 ECTS whereupon 1 ECTS stands for 30 hours workload (including attendance time at university and time for home and preparatory work). Based on the ECTS system a specific example of the model master curriculum (Figure 3a) has been elaborated. Here, 60 ECTS are attributed to advanced and introductory courses, 30 ECTS to interdisciplinary group work, and 30 ECTS to the master thesis. As stated previously, the curriculum proposal is to serve as template. Thus, the below given structure is open to be tailored to specific demands and capacities met at Exceed partner universities. In case other credit systems are applied, the weighting of advanced / introductory courses and joint group work can be based on the scheme presented in Figure 2. However, it should be noted that the "triple" structure and the content-related concept of the master curriculum on sustainable water management (Figure 2; Figure 3a-d) should be retained.

Figure 3a.
Detailed example of a model master curriculum on SWM; general structure and distribution of ECTS.

	Advanced	Introductory	
	Engineering; Natural Sciences; Social Sciences	Engineering; Natural Sciences; Social Sciences	
Σ 120 ECTS			
1st Semester	**20 ECTS**	**5 ECTS**	**5 ECTS**
2nd Semester	**20 ECTS**	**5 ECTS**	**5 ECTS**
3rd Semester Joint group work	**15 ECTS**	**15 ECTS**	
4th Semester	**Thesis (30 ECTS)**		

Figure 3b.
Detailed example of a model master curriculum on SWM; curriculum structure in case an undergraduate student educated in engineering sciences is joining the master.

	Advanced	Introductory	
	Engineering	Natural Sciences; Social Sciences	
1st & 2nd Semester	*Hydrology* *Hydraulic Engineering* *Hydrogeology* *Ecohydraulics* *Ecohydrology* *Sanitary Engineering* (water / sewage sludge treatment, planning and design) *River & Coastal Engineering* (erosion and sedimentation) *Risk Analysis*	Introduction to Water Natural Science 1	Introduction to Water Social Science 1
		Introduction to Water Natural Science 2	Introduction to Water Social Science 2
3rd Semester Joint group work	**15 ECTS - ICS 1**	**15 ECTS - ICS 2**	
4th Semester	**Thesis (30 ECTS)**		

Figure 3c.
Detailed example of a model master curriculum on SWM; curriculum structure in case an undergraduate student educated in social sciences is joining the master.

	Advanced	Introductory	
	Social Sciences	Natural Sciences; Engineering Aspects	
1st & 2nd Semester	*Water Governance* *Water Economics* *Sustainable Water Management* *Management of Transboundary Waters* *Legal Aspects of Water Management* *Socio-Cultural Aspects of Water Management*	Introduction to Water Natural Science 1	Introduction to Water Engineering 1
		Introduction to Water Natural Science 2	Introduction to Water Engineering 2
3rd Semester Joint group work	15 ECTS - ICS 1	15 ECTS - ICS 2	
4th Semester	Thesis (30 ECTS)		

Figure 3d.
Detailed example of a model master curriculum on SWM; curriculum structure in case an undergraduate student educated natural sciences is joining the master.

	Advanced	Introductory	
	Natural Sciences	Engineering and Social Aspects	
1st & 2nd Semester	*Ecology & Ecosystem Dynamics* *Ecosystem Degradation & Resilience* *Water & Health* *Ecotoxicology & Limnology* *Environmental Biotechnology* (treatment, remediation) *Water Quality & Chemistry* *Basic Analytical Methods* *Pollution Sources* *Pollution Analysis* (monitoring, control) *Fate & Bahaviour of Pollutants in Ecosystems*	Introduction to Water Engineering 1	Introduction to Water Social Science 1
		Introduction to Water Engineering 2	Introduction to Water Social Science 2
3rd Semester Joint group work	15 ECTS - ICS 1	15 ECTS - ICS 2	
4th Semester	Thesis (30 ECTS)		

Final remarks

Future water professionals are expected to be actively involved in sustainable water management integrating the technical/scientific expertise with socio-economic and environmental concerns.

Principle access to knowledge on the concept and implementation of sustainable water management skills in practice is generally required at four levels: (1) the policy level, where decisions are made on overall planning and development of the country's water resource, (2) the management level, where water management personnel require in-depth knowledge of interactions of the components of water resources to perform their work effectively, (3) the academic level, where future water professionals need to learn and acquire skills to address issues and challenges in sustainable water management, and (4) the engineering level, where engineers are trained and skilled to meet the future technological challenges of water related problems. In all four levels, training courses on

concept, principles and exposure to integrated planning and practices can also provide an effective means of required professional enhancement. Especially the training and the academic curriculum needs to be framed with interdisciplinary emphasis and methodological strategies that the future professionals acquire perception and required skills needed for sustainable water management.

The represented model master curriculum concept has been developed close to stored curriculum database information from Exceed partner universities and is thus reflecting the current educational standard and master course offers which cover different water related scientific disciplines.

Effectively, the model master concept could help establishing a respective master curriculum on SWM in the course of the planning and implementation of a new UNESCO Water Chair at the Mekele University (Ethiopia). A successful implementation in this respect can definitely be considered as one major outcome of the Exceed network cooperation.

ANNEX

The following tables present the preliminary analysis of master course information stored in the database. The analysis was upgraded with master curriculum data available from other universities (see table), which offer multi-disciplinary education in water science and management. In some cases, the frequency of sub-categories is almost congruent with the frequency that can be found in curriculum data of Exceed partner universities.

At the time of data acquisition and data analysis the required data from Aleppo, Alexandria, Botswana, and Malawi were not available.

Frequency of sub-categories I-X covered within courses belonging to the 1st main category **"Water Science & Engineering"**

Main category: Water Science & Engineering										
University	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
FU Sao Carlos										
PCU Rio de Janeiro	2	2	2				1			
UG Guadalajara	6	3	4	4	2	3	1	3		1
UNAM	2	5				4		3		
UN San Juan	3		1		1			1		
UF Pernambuco		1			1					
UF Santa Maria	6	5	3		2		5			
USP Sao Paulo										
Ain Shams	7	8	6	6	2	4	3	1	1	
Akdeniz	4		4	3	2	3	4	4		
Alexandria										
Konya / Selcuk										
MU Mansoura										
MU Mutha	3	6	1		1		1	1		
UA Aleppo										
UJ Jordan	3	1								
YTU Yildiz										
UCAE Bahir Dar	6	2					3	1		
MU Maseno	1			1	1			1		
MU / EIT Mekelle	1	3	1							
UdeO Ouagadougou	1	1	2				2			
UdeK Kara										
UdeL Lomé	1			1	2	2	1	2		
UB Botswana										
UM Malawi										
AIT	7	7	3	1	4	3	2	3	1	1
BAU Bogor	5	2	2		4		3		1	
GMU Gadjah Mada										
MCMC Ho Chi Minh	1	1					1		1	
TU Tongji		1			1					
WRU Hanoi	3	1	1		1		1	1		1
TUBS	5	6	3	1	1	1	3	3	1	1
Subcategory in total	**67**	**55**	**33**	**17**	**25**	**20**	**31**	**24**	**5**	**4**
Tufts University, USA	4	14	3		2					
University of Dresden, Germany	1	6	2		3		1	1	1	
ProWater TUBS, Germany	1	5	1		1					
Kristianstad University, Sweden	2									

I	Hydrology
II	Hydraulic Engineering
III	Hydrogeology
IV	Meteorology & Oceanography
V	Floods & Drought
VI	Coastal Engineering
VII	Erosion & Sedimentation
VIII	River & Coastal Morphology
IX	Salination
X	Desalination

Frequency of sub-categories I-XI covered within courses belonging to the 2nd main category **"Biological Aspects of Water, Health & Nutrition"**

Main category: Biological Aspects of Water, Health & Nutrition											
University	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**
FU Sao Carlos		1		2							
PCU Rio de Janeiro										1	
UG Guadalajara	3	2	1	2	2	1		1	1	6	
UNAM			1	2	1	1				2	
UN San Juan	1	1	1	2	2						1
UFP Pernambuco										1	
UFSM Santa Maria		1				1			1	2	1
USP Sao Paulo	2	1				2				1	
Ain Shams	2	1	1	2	1			3		1	
Akdeniz	1			1		2	1			1	
Alexandria											
Konya / Selcuk						1	1				1
MU Mansoura	1					1		1			
MU Mutha	1	1	1	3	2	4			1	4	4
UA Aleppo											
UJ Jordan		2								1	
YTU Yildiz											
UCAE Bahir Dar	1	1		2	2						1
MU Maseno						1					1
MU / EIT Mekelle											
UdeO Ouagadougou	1	1		1	1	1	1				1
UdeK Kara											
UdeL Lomé	1	1		2	1	1		2			2
UB Botswana											
UM Malawi											
AIT	4	3	4	1	2	6	3			2	
BAU Bogor	4	4	3	6	6	2	1	2	2	1	4
GMU Gadjah Mada	1	1			2				1		4
MCMC Ho Chi Minh	1	1		1	2	6	2			3	2
TU Tongji	2	1	1	3	2	2	1			1	2
WRU Hanoi			2		1						
TUBS	2	3	2		2	3		2			4
Subcategories in total	**28**	**26**	**17**	**30**	**29**	**35**	**10**	**11**	**6**	**27**	**28**
Tufts University, USA	9	2	1	2		3	1	1			
University of Dresden, Germany	1		1								2
ProWater TUBS, Germany	2			2		1				2	
Kristianstad University, Sweden	3			1		3					

I	Ecology & Ecosystem Dynamics
II	Eco-hydrology
III	Eco-hydraulics
IV	Ecosystem Degradation & Resilience
V	Ecosystem Valuation
VI	Water & Health
VII	Water Diseases & Epidemiology
VIII	Food & Nutrition
IX	Biochemical analytical methods
X	Microbiological & biochemical aspects
XI	Ecotoxicology

Frequency of sub-categories I-XII covered within courses belonging to the 3rd main category
"Chemical Aspects of Water, Environmental & Anthropogenic Aspects"

Chemical Aspects of Water, Environmental & Anthropogenic Aspects												
University	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
FU Sao Carlos	2	6	1				5				1	5
PCU Rio de Janeiro	1		2			2		2				
UG Guadalajara	2	2	1		1	2	6	3	2			3
UNAM	3	3	3				3				1	3
UN San Juan	1	1					2	1	1		4	2
UFP Pernambuco			3				5	1	1		1	2
UFSM Santa Maria	2	1	2	1	1	9	7	1	7		1	6
USP Sao Paulo	1	2	2	1			6					3
Ain Shams	1	1	4	1		2	5	1			8	6
Akdeniz			3				2	2				7
Alexandria												
Konya / Selcuk	1		3	1	1		3		2			2
MU Mansoura												
MU Mutha	6	1	7	3	1		4	4	4		1	8
UA Aleppo												
UJ Jordan	1		2	1	1	1	1	1	5	1	1	4
YTU Yildiz												
UCAE Bahir Dar						1					3	
MU Maseno	1	1	2			1	2		1		1	1
MU / EIT Mekelle												
UdeO Ouagadougou	1	1	1		1	1		1			2	2
UdeK Kara												
UdeL Lomé	1		3	1	1		1				3	1
UB Botswana												
UM Malawi												
AIT	2	6	2		1	5	5	2			9	6
BAU Bogor		1	2		1	6	2				13	6
GMU Gadjah Mada	2		3	3	4	1		2	1			2
MCMC Ho Chi Minh	1	8	7	1	1	2	7	1	1		7	6
TU Tongji	4	3	2		1		6				2	4
WRU Hanoi						1					3	2
TUBS	5	4	6	2	2	3	5	1	2	1	3	6
Subcategories in total	**38**	**41**	**61**	**15**	**17**	**37**	**77**	**23**	**27**	**2**	**64**	**87**
Tufts University, USA			1			2				2	3	6
University of Dresden, Germany		3		1		3	1					5
ProWater TUBS, Germany				1	1	3	2		1			4
Kristianstad University, Sweden		5				1	1	1			1	3

I	Origin and processes of water pollution
II	Rural, urban and industry issues
III	Pollution analyses
IV	Fate and behaviour of xenobiotica
V	Influence of micropollutants
VI	Soil sciences
VII	Wastewater treatment
VIII	Remediation
IX	Chemical analytical methods
X	Irrigation & Agriculture
XI	Planning, design and construction
XII	Water Quality & Water Chemistry

Frequency of sub-categories I-VI covered within courses belonging to the 4th main category **"Water Management, Social, Political & Legal Aspects"**

Social, Political & Legal Aspects / Water Management						
University	**I**	**II**	**III**	**IV**	**V**	**VI**
FU Sao Carlos	1					1
PCU Rio de Janeiro	1					
UG Guadalajara						
UNAM						1
UN San Juan	1		2	1	1	4
UFP Pernambuco					1	1
UFSM Santa Maria						2
USP Sao Paulo						
Ain Shams		1	2	2	1	8
Akdeniz		1	1			1
Alexandria						
Konya / Selcuk						
MU Mansoura						
MU Mutha					1	1
UA Aleppo						
UJ Jordan			1		2	2
YTU Yildiz						
UCAE Bahir Dar	2			1	1	4
MU Maseno						1
MU / EIT Mekelle						
UdeO Ouagadougou	2	1				2
UdeK Kara						
UdeL Lomé	3	3	2			6
UB Botswana						
UM Malawi						
AIT	9		1	4		9
BAU Bogor	1		2	3		13
GMU Gadjah Mada	1					
MCMC Ho Chi Minh	8					7
TU Tongji	4	1	1	2		1
WRU Hanoi		1	4		1	5
TUBS		1	1	1		4
Subcategories in total	**33**	**9**	**17**	**14**	**8**	**73**
Tufts University, USA			3		1	11
University of Dresden, Germany	1	1				7
ProWater TUBS, Germany				1	1	5
Kristianstad University, Sweden						2

I	Development studies
II	Peace and Conflict Research
III	International Water Policy between conflict and development
IV	International Water and Climate Protection Policy
V	Legal aspects of water
VI	Water Management & economic aspects