HYDROLOGIC AND ENVIRONMENTAL MODELLING

OBJECTIVES

Ref	19. Objectives of the curricular unit
O1	Understand natural fluid systems, specially as agents for erosion, transport and dispersion of environmental pollution.
O2	Build an understanding of the covers use and conservation of water and edaphic resources, and the control of hazards.
O3	Develop models aimed at simulations, predictions, and ultimately sustainable environmental management.

SYLLABUS

Ref	20. Syllabus	Contact hours
CT1	Watershed Runoff and Erosion Modelling: Hydrologic factors; Distributed models; Runoff Hydrographs; Flow in hillslope and natural channels; Water erosion; Empirical and process based models; Sensitivity and uncertainty analysis; and Critical review and intercomparison of existing models.	
CT2	Computer Methods Applied to Water Quality Modelling: Characterisation of lotic and lentic ecosystems; Completely Mixed Systems; and Incompletely Mixed Systems.	
CT3	Air Pollution: Sources and effects of air pollutants; and Interaction with water and edaphic resources.	
CT4	Watershed Management: Integration of various aspects of anthropogenic impacts on the environment, including terrestrial, atmospheric, and aquatic systems using GIS and remote sensing application in watershed management; and Integrated watershed management (e.g. flood, land degradation, pollution, hydroecology).	
	Total (hours)	
	ECTS	

BIBLIOGRAPHY AND OTHER REFERENCES

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Akan, A., Houghtalen, R. J. (2003). Urban hydrology, hydraulics and stormwater quality: engineering applications and computer modeling. John Wiley & Sons, New Jersey.
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Chow, V.T., Maidment, D., Mays, L.W. (1988). Applied Hydrology, McGraw-Hill, New York.
De Nevers, N. (2000). Air Pollution Control Engineering. 2nd Edition, Waveland Press, Illionois.
Fifield, JS. (2004). Designing for Effective Sediment and Erosion Control On Construction Sites. 2nd Edition, Forester Press, CA.

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Hardisty, J, Taylor, DM., Metcalfe, SE. (1993). Computerised Environmental Modelling: A Practical Introduction Using Excel, John Wiley & Sons, New York.
Johnson, L. (2009). Geographic Information Systems in Water Resources Engineering. CRC Press, Boca Raton.
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Thomann, RV., Mueller, JA. (1987). Principles of Surface Water Quality Modeling and Control. Harper Collins Publisher, NY.