

MASTER OF SCIENCE IN INTEGRATED WATERSHED MANAGEMENT

AGE 856	Principles Of Integrated Water Resources Management
Course content (including topics)	Examination of Integrated Water Resources Management (IWRM), its basic principles and the key concepts. IWRM in space, time and by sector. Overview of water demand per sector. Systems approach and problem analysis in IWRM. Management skills and economic principles for pricing and cost recovery
AGE 857:	Policy and Interventions in Watershed Management
Course content (including topics)	The value of water. Institutions and the law: Local and national water law and institutions. Water legislation in Eastern Africa and international water courses. Land tenure issues in watersheds. Policy interventions in watershed management. Environmental planning and management policies in a watershed. Conservation education with emphasis on Eastern Africa
AGE 858:	Mapping, Field and laboratory Techniques
Course content (including topics)	Practical unit focusing on mapping, field and laboratory techniques. The map as a model of geographic data: Scale, Geodetic datum, Coordinate and projection systems, Thematic Maps: soil, drainage, vegetation, land use; Field techniques, Participatory and social research techniques; Soil and water measurements
AGE 859:	Computing for Watershed Management
Course content (including topics)	Current computer hardware and its operation, basic computer procedures, word-processing, data entry and spreadsheets, retrieval and analysis using standard software packages, operating and application of statistical software in designing research, data management and analysis. The role and character of research; Planning a research project; purpose, sources of background information, research design and proposal writing. Data collection and quality control. Analysis of results. Presentation and interpretation of results. Publication procedures.
AGE 860	Watershed Degradation and Rehabilitation

Course content (including topics)	Dynamics of watershed degradation. Soil, water and wind erosion, rainfall erosivity, soil erodibility and soil loss prediction. Soil and water pollution, wastewater and drainage systems. Surface cover and deforestation. Microbial degradation and cycling of pesticides and heavy metals. Effects of fire and grazing. Climate change and impact on water and other resources in the watershed. Reclamation and management of salt affected soils. Management and rehabilitation of degraded watersheds.
AGE 861:	Remote Sensing and Geographical Information Systems
Course content including topics	Aerial photography: concepts and principles. Photogrammetry and geometric corrections, air photo interpretation and its application. Remote Sensing: principles, platforms and sensors, visual interpretation and digital image processing. Applications of remote sensing data for monitoring of environmental resources. Land use/land cover, flood assessment and impacts. Geographical Information Systems: data input, management, retrieval, analysis and presentation. Practicals based on relevant software applications.
AGE 862	Socio-Economic, Legal, & Administrative Aspects of Watershed Management
Course content (including topics)	Concepts of ethics, socio-cultural aspects, socio-economic aspects and issues, gender and equity. Water users, contestations and resolutions; water security vs. water independence. Virtual water. Administrative aspects in watershed management. Conflicts in implementing relevant laws. Transboundary waters. Socio-economic and legal concerns; the Ozone layer, biological diversity, hazardous waste, desertification, climate change and pollution. Rights to a decent environment. Role of stakeholders: communities, institutions, government, and others. Case studies from Eastern Africa.
AGE 863	Demand and Supply of Watershed Resources
Course content (including topics)	Sustainability concept in a watershed. Resource survey in a watershed; soils, water, minerals, and forests. Overview of resource demand and supply. Water quality, demand, uses and supply. Potential environmental impact of resource use. Environmental auditing, optimal utilization of environmental resources. Environmental externality and environmental public goods. Economics of technological choices and alternatives: concepts, indicators, measurements and applications. Environmental standards, environmental economics, policy options, and the integrated management of environmental resources.

AGE 864	Hydrological Processes and Watershed Modelling
Course content (including topics)	The Hydrologic Cycle and human influence on Hydrologic cycle; Precipitation forms and spatial- temporal distribution and intensity; Evaporation and Evapo-transpiration; measurements and estimation methods; Infiltration process; Measurements and infiltration equations; water flow and retention in the unsaturated zone. Methods of infiltration estimation. Surface water runoff, hydrographs, floods and low flows; Variable Source Area Concept; Ground Water recharge and discharge processes; Erosion and sediment transport and siltation processes; Experimental investigations of Hydrological processes. Major hydrological processes and field measurement techniques. Watershed parameters and their derivation. Watershed modelling. Hydrological response units.
AGE 865	Watershed Use, Planning and Management
Course content (including topics)	Management and planning tools, watershed management plans, management skills, process design and organization design. Water user groups; Transboundary waters; conflicts, principles and options. Sustainability in watershed management. Generating income from watershed resources. Experiences from East Africa. Any relevant case studies.
AGE 866	Environmental Impact Assessment In A Watershed
Course content (including topics)	Historical background of Environmental Impact Assessment (EIA) - including Social Impact Assessment (SIA); Requirements, Principles, Guidelines and core values for EIA and SIA; Stakeholder involvement and Public Participation in the EIA process; Methods of Impact Identification and Analysis; Preparation of Environmental Impact Statement (EIS) and/or Reporting; Environmental Monitoring and EIA policies and Legislation in Eastern Africa
AGE 867	Watershed Evaluation
Course Description	Students will be introduced to a specific watershed and will work as a group. They will be expected to use the acquired knowledge, techniques and tools to identify the problems and produce a research proposal for the selected watershed. The students will be expected to use the developed research proposal to carry out research in the watershed. Students will also be introduced to the selected Watershed to enable familiarisation and conceptualisation of their final

	Master's Thesis to be undertaken in AGE 890.
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