WATR7800 - Water and agricultural landscapes (2 units)

Integration module (Specialisation stream #3: Water, land and people)

Module description

Participants will develop the capacity to think broadly about and assess the positive and negative ecological, social and economic impacts of agriculture, and will be introduced to some tools that can help harmonise agricultural systems. The module methodology departs from the experience and expectations of each participant/student, 'back-casting' from their individual objectives and building a learning progress process along the Module that supports the participant to understand, filter and incorporate each learning activity into his/her own learning objectives. It is expected that participants will contribute substantially to discussions and workshops, proactively contributing their own experiences to support peer learning, enthusiastically absorbing the experiences of others, and actively seeking to connect what they hear, see and do with their own Personal Learning Objectives.

Module introduction

Participants will develop an understanding of how land use relates to the water cycle with examples on agricultural systems and principles of sustainable management at a range of scales, from soil profiles to global systems. They will be able to converse with agriculturalists as informed water managers. Principles of efficient irrigation water use and conservation of water in dryland systems and saline agriculture will be emphasised.

Intensification of land use has led to degradation of affected ecosystems and this unit will introduce participants to remediation techniques to counter land and water degradation through better management.

An understanding of agricultural water management and methods of environmental protection will prepare participants for problem-based learning (PBL) work. Interactive models will be utilised to assess the impacts of management decisions on water quality and farm productivity. Risk-based decision making of water management will be embedded into the module with an emphasis on linking management to governance. Alternative water use and urban encroachment on agricultural land will be examined.

Module delivery

- **Full-time** (on-campus) students, including international students, are required to enrol in this module in the summer semester. They are required to attend a seven day, Perth-based teaching block, including two days of field work. Preparation work may be undertaken beforehand online.
- **Part-time** (external) students are required to attend the same seven day, Perth-based teaching block including two days of field work. Preparation work may be undertaken beforehand online.

Mannum, South Australia

IWC Graduates receive a co-badged degree from four leading Australian universities, ranked among the top 1% of the best universities in the world for teaching and research. (QS World University Rankings).

Assumed background

This is a postgraduate course in general water science offered as part of the International WaterCentre Masters of Integrated Water Management, and one of two specialist courses for those participants following the 'Water, Land and People' stream. Participants are expected to have basic background knowledge through undergraduate science or engineering programs, however this is not essential. It is anticipated that the student group will have diverse range and depth of professional experience, including some participants with no postgraduate work experience. Participants must have successfully completed the Masters foundation modules: 'New perspectives project management', 'Science of water', 'Water, sustainability and development', and 'Water governance and policy'.

Learning objectives

After successfully completing this module participants are able to:

- Have an understanding of global trends for population growth, climate change, water demand and food security
- Understand key directions in water resource management for sustainable agriculture
- Understand the different modes of agricultural production for rain-fed and irrigated systems and their impacts on land management, water resources, ecosystems and community
- Have an overview of innovative solutions for efficient and effective use of water and land resources for different agricultural systems
- Understand the context of water redistribution in landscapes of different climate regions and its impact on agricultural practices and ecosystems
- Achieve a comprehensive view of the harmonisation of economic, social and ecological dimensions of agriculture
- Have an understanding of the integrative components of land and water management in an agricultural context.

Teaching staff

Lecturers for this module are drawn from the Centre of Excellence for Ecohydrology at The University of Western Australia.

Module Coordinator: Prof Jeff Camkin

Module Co-coordinator: A/Prof Susana Neto

Lead Lecturer: Prof Neil Coles

Lecturer: Prof Keith Smettem

Lecturer: Prof Mark Rivers

Lecturer: A/Prof Edward Hauck

Lecturer: A/Prof Ed Barrett-Lennard

Problem-Based Learning (PBL) projects

Parallel PBL projects and field trips run through the semester, comprising roughly 50% of the assessment weight. Full-time students complete two PBL projects per semester, while part-time students complete one PBL per semester.

PBL projects for the Integration semester comprise:

- **PBL3:** Integrated catchment management – developing strategies for change *(Individual project)*
- **PBL4:** Learning lessons from integrated water management in practice *(Individual project)*

Field trips

As part of this module (Water and agricultural landscapes), both full-time and part-time students also undertake:

- A one-day field trip to the Peel-Harvey Catchment and Harvey Irrigation Area, and
- A one-day field trip to Gnangara mound

These two day trips are part of a seven-day teaching block in Perth, undertaken during the summer semester.

For a complete list of field trips that participants undertake during the program, please refer back to "Field trips" on page 5 of this syllabus or visit the IWC website.