

# AGEN 7008 WATER SUSTAINABILITY IN AGRICULTURE

**Credit Points** 10

**Coordinator** Jason Reynolds ([https://directory.westernsydney.edu.au/search/name/Jason Reynolds/](https://directory.westernsydney.edu.au/search/name/Jason%20Reynolds/))

**Description** Population growth, urbanisation and climate change have increased the competition for water and affected water available for agriculture. The growing demand for food must be obtained using existing water resources sustainably. This subject will focus on the current status, trends and challenges of agricultural water management; understanding the practical and technical aspects of crop water requirement; the allocation, distribution, governance and use of water in agriculture; water management at the farm and regional levels; crop water relations, crop yields and water productivity; irrigation, drainage, and salinity in cultivated areas; rainwater harvesting and crop water management in rainfed areas; the use of wastewater and other low quality waters in agriculture; groundwater management in agriculture and conjunctive use of groundwater and surface water; and the internet of things and digital technologies for managing water in agriculture.

**School** Science

**Discipline** Agriculture, Environmental and Related Studies, Not Elsewhere Classified.

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Postgraduate Coursework Level 7 subject

**Restrictions**

Must be enrolled in a postgraduate program

## Learning Outcomes

After successful completion of this Subject, students will be able to:

1. Critically examine the issues and challenges of agricultural water management.
2. Analyse crop water requirements and options for improving water productivity
3. Evaluate different technical innovations to improve water sustainability in agriculture.
4. Reflect on the sustainable water management principles at the farm and catchment levels.
5. Evaluate strategies for improving water and food security for and with key stakeholders including local indigenous communities and agricultural management authorities.

## Subject Content

The subject comprises four main topics:

**Workshop 1. Water sustainability in agriculture.**  
Sustainable and resilient agricultural systems depend on sustainable and resilient water management. The topics to be covered will include on-farm irrigation management concepts; water reuse and

management; and developing farm level water management plans for improving water productivity and sustainability in agriculture.

**Workshop 2. Water sustainability and markets.**  
Management of water resources in response to climate change, population growth, and economic development is a delicate balance. The limited supply of water has to meet the demands for agriculture, environment, and social and culture needs. The topics include water markets, water trading, water pricing and the balance between the demands for broadscale agricultural practice and environmental outcomes.

**Workshop 3. Water storages in agriculture.**  
Water storage systems play an important role in sustainable agricultural development. Reserves including groundwater, river storage, and dams provide storage capacity for agricultural using during droughts and diversified the cropping system. Topics include the basic concepts of water hydrology; participatory groundwater monitoring and water storages.

**Workshop 4. The Murray Darling Basin.**  
The Murray–Darling Basin is a system of interconnected rivers and lakes. Water is used for a variety of purposes and there are rules around how water is shared. Water from the Basin helps in the production of \$30 billion in agricultural production each year and 40% of Australia's farms are within the Basin. The topics covered include: The ancient origin of the basin, the chemistry of water sources, river management, and the future of the basin.

**Workshop 5. Agriculture on the Peri-Urban Fringe**  
The per-urban fringe experiences pressure from urban encroachment and competing water uses. Water can be re-used and recycled for agricultural purposes generating circular economies for nutrients. Topics include: water treatment, water chemistry, nutrients, and emerging contaminants of concern.

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/Group Task
Essay	500 words	40	N	Individual
Presentation	Two group presentations at 15 minutes each	30	N	Individual
Report	2,000 words	30	N	Individual

Teaching Periods

## Spring (2024)

### Hawkesbury

#### On-site

**Subject Contact** Jason Reynolds ([https://directory.westernsydney.edu.au/search/name/Jason Reynolds/](https://directory.westernsydney.edu.au/search/name/Jason%20Reynolds/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=AGEN7008\\_24-SPR\\_HW\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=AGEN7008_24-SPR_HW_1#subjects))