AGEN 1001 WATER QUALITY ASSESSMENT AND MANAGEMENT

Credit Points 10

Legacy Code 300814

Coordinator Jack Isherwood (https://directory.westernsydney.edu.au/search/name/Jack Isherwood/)

Description Water is essential for all life on earth. This subject will equip students with skills in biological, chemical and physical water quality assessment for a sustainable water future. The subject introduces students to healthy natural waterways and contrasting degraded waters impacted by disturbance from human activities. A broad range of pollutants, their sources and the consequences for human health and the ecology of water ways will be investigated. Management strategies will also be examined based on the sound scientific assessment of water quality. Students in this subject will cover water quality legislation, regulation, policy, guidelines and develop competencies in water monitoring, regulation, treatment and management.

School Science

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

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 1 subject

Equivalent Subjects AGEN 2002 - Water Quality Assessment and Management

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Describe and select the physical, chemical and biological components as indicators of water quality.
2. Identify using physical, chemical and biological indicators when water is polluted and describe these pollutants including metals, polycyclic aromatic hydrocarbons, petrochemical (e.g. petrol, oils, greases), nitrates, phosphates, human and faecal waste.
3. Identify, describe and predict the origins, nature and impact of where water quality degradation may occur from industrial, commercial, residential, agricultural contamination at local, regional and national context. For example Stormwater runoff, leaking sewers in Sydney, dioxin release from the old Union Carbide site into Port Jackson and diffuse animal faecal pollution in areas such as Warragamba dam.
4. Design and plan field auditing protocols for pollution study.
5. Identify approaches put in place by the water authorities in terms of catchment management; water and sewage treatment; trade-waste management; stormwater management and treatment; land application (to minimise phytonutrients entering receiving waters); monitoring by health and water authorities.
6. Describe the basis of the legal framework used for water quality management, with particular reference to the Australian Drinking Water guidelines, and Australian and New Zealand Guidelines for Fresh and Marine Water Quality.
7. Interpret the results of water quality audits in the context of legal, regulatory compliance and scientific guidelines in water management issues and community accountability.
8. Explore the special issues of World and local water scarcity (with climate change implications), maintaining sustainable environmental flows, water recycling, stormwater harvesting, water-related health emergencies (boil-water alerts, Norovirus transmission), special ecological impacts (such as EDCs and hermaphrodism; biodiversity reduction) and important pollution case histories (eg: Minamata disaster).
9. Collect water samples aseptically and safely for a range of chemical and bacteriological analyses, specify tests required and the correct transportation medium and containers to ensure chain-or control during transportation with necessary documentation.
10. Gather, analyse and describe a variety of appropriate information sources.

Subject Content

Strategies for the identification and management of water, in the maintenance of water quality for recreational, domestic, industrial and agricultural uses, and for the protection of natural ecosystems.
Water pollution and water management, identification of specific water pollution threats associated with operations in the built environment. These will be placed in the context of water use and availability patterns as pertaining to Australia in general and to NSW in particular.
Assessment of indicators in the auditing of simple impacts on water quality in terms of domestic, recreational, agricultural and industrial uses, and ecosystem management needs.
Legislation and the interpretation of the legal framework used for water quality including drinking water management.
Field visit to sample water in various locations and/or waste water treatment and management sites.

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
Report - Communicating water science	2,000 words	30	N	Individual
Quiz - Multiple Choice and Short Answer Questions	1.5 hrs	30	N	Individual
Final Exam - Multiple Choice and Short Answer Questions	2 hours	40	N	Individual

Prescribed Texts

- James Edzwald Water Quality & Treatment: A Handbook on Drinking Water, American Water Works Association (e-book: https://www-accessengineeringlibrary-com.ezproxy.uws.edu.au/content/book/9780071630115/chapter/chapter3)

Teaching Periods