Description: Freshwater Ecology

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
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<tr>
<td>BIO</td>
<td>3308</td>
<td>25259</td>
<td>2, 2003</td>
<td>ONC</td>
<td>1.00</td>
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Academic Group: FOSCI
Academic Org: FOS002
HECS Band: 2
ASCED Code: 010905

STAFFING
Examiner: Andrew Le Brocque
Moderator: Neil McKilligan

PRE-REQUISITES
Pre-requisite: BIO2208

OTHER-REQUISITES
Prerequisites 62221

RATIONALE
Freshwater is Australia's scarcest renewable resource. It is therefore important that science and engineering students have the knowledge necessary for an ecological approach to water resource management. The course is designed to provide the theoretical knowledge and practical skills necessary to analyse the physical, chemical and biological properties of freshwater ecosystems.

SYNOPSIS
The course provides detailed knowledge of the interactions between physical, chemical and biological processes in aquatic ecosystems, and the influence of human activities on these processes. The main theoretical aspects are: characteristics and concepts of lotic and lentic aquatic ecosystems at different temporal and spatial scales; the structure of aquatic plant and animal communities that include biofilms, periphyton, macrophytes, phytoplankton, zooplankton, benthic macroinvertebrates and fishes; nutrient cycling, trophic structure and aquatic productivity; wetland, riparian and catchment management and ecosystem health. This theory provides a framework for applied freshwater topics: macroinvertebrates as biomonitors; blue-green algae, salinity, eutrophication and other current water management issues; freshwater aquaculture systems, and effluent control. Practical work will include compulsory extended field studies. This course is offered in odd years only.
OBJECTIVES

On completion of this course students will be able to:

- describe the distinctive features of Australian inland waters and have a basic knowledge of the aquatic communities located in the limnetic and benthic regions of lotic and lentic ecosystems;
- demonstrate a sound knowledge of the interactions between physical and chemical processes in streams, rivers, lakes and dams;
- analyse and describe the factors affecting the growth of phytoplankton, zooplankton and benthic invertebrate and plant assemblages;
- describe the causes and consequences of eutrophication, salinisation and other management issues;
- demonstrate a sound knowledge of freshwater aquacultural systems and water quality control;
- demonstrate an understanding of the effects of organic and toxic wastes on aquatic systems;
- identify a wide variety of lotic macroinvertebrates and plankton;
- analyse and communicate effectively the results of field and laboratory work using a style common to scientific reports;
- demonstrate competence in practical work, in both the field and laboratory, in freshwater ecology.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Physical, chemical and biotic characteristics of fresh waters - physical characteristics; - chemical characteristics; - biota;</td>
<td>45.00</td>
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<tr>
<td>2. Analysis of freshwater physical, chemical and biotic data - data transformation in ecology; - bio-statistical and numerical analysis;</td>
<td>10.00</td>
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<td>3. Ecology of freshwater systems - primary productivity &amp; carbon flow; - wetlands; - freshwater parasites - Australian fish</td>
<td>23.00</td>
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<tr>
<td>4. Introduction to freshwater aquaculture - species and aquacultural systems; - physical and chemical aspects; - sustainability &amp; management of aquacultural systems - parasites and diseases in aquaculture and natural freshwater systems</td>
<td>11.00</td>
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<tr>
<td>5. Bioassessment and water management issues - species and aquacultural systems</td>
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TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

**REFERENCE MATERIALS**

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


**STUDENT WORKLOAD REQUIREMENTS**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Examinations</td>
<td>4</td>
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<tr>
<td>Field Trips or Excursions</td>
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<tr>
<td>Laboratory or Practical Classes</td>
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<tr>
<td>Lectures</td>
<td>26</td>
</tr>
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<td>Private Study</td>
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<td>Report Writing</td>
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ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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<tr>
<td>REPORT 1</td>
<td>20.00</td>
<td>20.00</td>
<td>Y</td>
<td>26 Aug 2003</td>
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<tr>
<td>1.5HR CLOSED THEORY TEST</td>
<td>25.00</td>
<td>25.00</td>
<td>Y</td>
<td>02 Sep 2003</td>
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<tr>
<td>REPORT 2</td>
<td>25.00</td>
<td>25.00</td>
<td>Y</td>
<td>07 Oct 2003</td>
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<tr>
<td>2HR CLOSED THEORY EXAM</td>
<td>30.00</td>
<td>30.00</td>
<td>Y</td>
<td>END S2</td>
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</tbody>
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NOTES:

. Examination dates will be available during the Semester. Please refer to the examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
   It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2 Requirements for students to complete each assessment item satisfactorily:
   To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item. To complete the examination satisfactorily, students must obtain at least 50% of the marks available for the examination. To complete the practical component satisfactorily, students must submit all of the nominated practical reports and obtain at least 50% of the marks available for each report submitted.

3 Penalties for late submission of required work:
   If students submit assignments after the due date without prior approval then a penalty of up to 20% of the total marks gained by the student for the assignment will apply for each working day late.

4 Requirements for student to be awarded a passing grade in the course:
   To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by: (i) satisfactorily completing the examination and assignments; and (ii) obtaining at least 50% of the total weighted marks available for all summative assessment items.

5 Method used to combine assessment results to attain final grade:
   The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.

6 Examination information:
   In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will normally be held during the examination period at the end of the semester of the next offering of this course, although at the discretion of the examiner, in consultation with the student(s) an alternative date may be arranged.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL http://www.usq.edu.au/SECARIAT/calendar/Part5/ or in the printed version of the current USQ Handbook.

ASSESSMENT NOTES

9 In order to attend laboratory classes, students must provide and wear appropriate personal protective equipment. This shall include a laboratory coat, closed in shoes, and safety glasses. Such equipment must be approved by supervising staff. Failure to provide and wear the appropriate safety equipment will result in students being excluded from classes.

10 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner. Students must retain a copy of each item submitted for assessment. If requested by the Examiner, students will be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being made. In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.

11 A Course Assignment Cover Sheet, signed by the student must be attached to all submitted assignments. Failure to do so may result in the assignment not being graded.