Description: Biomedical Engineering

<table>
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<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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<td>ELE</td>
<td>3509</td>
<td>21169</td>
<td>1, 2003</td>
<td>ONC</td>
<td>1.00</td>
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Academic Group: FOENS
Academic Org: FOES04
HECS Band: 2
ASCED Code: 039903

STAFFING
Examiner: John Grant-Thomson
Moderator: Jim Ball

PRE-REQUISITES
Pre-requisite: ELE1301 and ELE1502

OTHER-REQUISITES
Pre-requisite: 70335+70326

SYNOPSIS
In most modern societies an important component of health care is the hospital. In the last decade, these organisations have become more reliant on scientific methods and technological devices in the management and comprehensive delivery of their routines. Biomedical engineers provide the necessary technical support for the operation and development of these services. These services include the principles and applications of therapeutic medical devices to assist the body in its function, together with clinical measurement to assess human performance. This is unique among the engineering fields in that it not only requires technical training, but also clinical and social interfacing to be fully effective. Biomedical Engineering has been designed as a course that reflects this integrated concept in engineering, and introduces students to situations typical of current technological change involving man/machine interaction.

OBJECTIVES
On completion of this course, students should be able to:

- demonstrate a knowledge of basic human anatomy;
- describe the fundamental mechanisms of human physiology, highlighting the features of clinical significance when considering the function of organ systems;
• appreciate bioelectric signals and their use in clinical measurement both from in-vivo and in-vitro origins;
• develop an awareness for human engineering and its role in prosthetics and orthotics;
• identify and describe the techniques used in medical imaging;
• interpret patient safety specifications and their relevance in the clinical environment.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>1. Anatomy</td>
<td>5.00</td>
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<tr>
<td>2. Physiology</td>
<td>10.00</td>
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<tr>
<td>3. Signals and Transducers</td>
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<tr>
<td>4. Prosthetics and Orthotics</td>
<td>20.00</td>
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<td>5. Therapeutic Devices</td>
<td>20.00</td>
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<tr>
<td>6. Medical Imaging</td>
<td>15.00</td>
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<td>7. Electromedical Safety</td>
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</table>

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.

1982, AS2500-1982 *Guide to the Safe Use of Electricity in Patient Care*, Standards Association of Australia,
Bronzino, J. D. 1992, *Management of Medical Technology*, Butterworths,

STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Examinations</td>
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<td>Lectures</td>
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<td>Private Study</td>
<td>81</td>
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<td>Tutorials or Workshops</td>
<td>42</td>
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ASSESSMENT DETAILS

<table>
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<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>TEST 1 - 1 HR SHORT ANSWER</td>
<td>300.00</td>
<td>30.00</td>
<td>Y</td>
<td>07 Apr 2003</td>
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<tr>
<td>TEST 2 - 1 HR MULTIPLE CHOICE</td>
<td>100.00</td>
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<tr>
<td>2 HOUR CLOSED EXAMINATION</td>
<td>600.00</td>
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</table>

NOTES:
- The Examiner will advise students of the date of the test during the semester.
- The Examiner will advise students of the date of the test during the semester.
- Student Administration will advise students of the dates of their examinations during the semester.

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 (or at least a grade of C-) for each assessment item.

3 Penalties for late submission of required work:
   Not applicable.

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 satisfactorily completing all summative assessment items (the examination and assignments), as stated in 2 above.

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 (or grades) 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 be held during the examination period at the end of the semester of the next offering of this course.
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

1 Students who have undertaken all of the required assessments in a course but who
have failed to meet some of the specified objectives of a course within the normally
prescribed time may be awarded the temporary grade: IM (Incomplete - Make up).
An IM grade will only be awarded when, in the opinion of the examiner, a student
will be able to achieve the remaining objectives of the course after a period of
non-directed personal study.

2 Students who, for medical, family/personal, or employment-related reasons, are
unable to complete an assignment or to sit for an examination at the scheduled time
may apply to defer an assessment in a course. Such a request must be accompanied
by appropriate supporting documentation. One of the following temporary grades
may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete
Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred
Make-up).

3 The Faculty of Engineering and Surveying does not offer supplementary
examinations.