Subject Description Form

<table>
<tr><td>Subject Code</td><td>BME5134</td></tr>
<tr><td>Subject Title</td><td>Rehabilitation Engineering</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>5</td></tr>
<tr><td>Responsible staff & Department/School</td><td>Dr Xiaoling HU (BME), Dr Eric W. C. TAM (BME) & Dr Aaron K. L. LEUNG (BME)</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>BME3115 Bioelectrical Technology II – Electronics;
BME3141 Orthopaedics, Traumatology and Rehabilitation;
or equivalent</td></tr>
<tr><td>Objectives</td><td>This subject aims to provide students a good background on current engineering solutions and their limitations for persons who suffer from physical or sensory impairments.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

a. Apply fundamental knowledge of engineering in rehabilitation
b. Apply analytical skills to assess and evaluate the need of the end-user
c. Conduct patient/technology evaluation via theuse of modern instrumentation
d. Develop self-learning initiatives and integrate learned knowledge for problem solving</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>This subject is concerned with the application of engineering solutions for people with disabilities. Rehabilitation is multi-disciplinary in nature and the team approach is the preferred clinical approach in the provision of rehabilitation engineering devices. The ideal team consists of medical and health professionals and rehabilitation engineers. This subject is appropriate for professionals concerned with rehabilitation.

The contents of this subject covers:
- Augmentative and Alternative Communication Devices
- Sensory Aids for Hearing and Visual Impairments
- Seating and Mobility Devices
- Prosthetics and Orthotics Technology
- Evaluation and Training Technology
- CAD/CAM Application in Rehabilitation
- Human-Machine Interface and Universal Design
- Emerging Technologies</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lecture, laboratories and/or presentations
<table>
<tr><td rowspan="2">Teaching/learning methodology</td><td colspan="6">Intended subject learning outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Lectures</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Labs</td><td></td><td>√</td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>3. Presentations</td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td></tr>
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<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Assignments, lab reports and/or presentations</td><td>70 %</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Quiz</td><td>30 %</td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
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Different assignments and lab experience and/or presentations were used to guide the students towards the learning objectives of this course. Students are expected to demonstrate their learned knowledge through the quiz.
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<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>□ Lectures/Tutorial/Seminar</td><td>33Hrs.</td></tr>
<tr><td>□ Laboratories</td><td>6Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>□ Self-study</td><td>63Hrs.</td></tr>
<tr><td>□ Assignments and laboratory reports</td><td>40Hrs.</td></tr>
<tr><td>Total student study effort</td><td>142Hrs.</td></tr>
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<tr><td>Reading List and References</td><td>

1. Cook A.M. and Hussey S.M., Assistive Technologies: Principles and Practice, Mosby, USA, 1995.
2. Cooper R.A., Rehabilitation Engineering Applied to Mobility and Manipulation, Institute of Physics Pub., 1995.
3. Dejan Popovic and Thomas Sinkjaer, Control of Movement for the Physically Disabled, Springer, 2000.
4. Gray D.B., Quatrano L.A., Lieberman M.L., Designing and using Assistive Technology – the human perspective, Brooks, 1998.
5. MacLachlan M. and Gallagher P. Enabling Technologies – Body Image and Body Function, Churchill Livingstone, 2004.
6. Mann W.C. (ed). Smart Technology for Aging, Disability, and Independence – The State of The Science, Wiley, New Jersey, 2005.
7. Muzumdar A. Powered Upper Limb Prostheses – Control, Implementation and Clinical Application. Springer, 2004.
8. Scherer M.J., Assistive Technology: Matching Device and Consumer for Successful Rehabilitation, American Psychological Association (APA), 2002.
9. Smith R.V. and Leslie J.H., Rehabilitation Engineering, CRC Press, 1990.
10. Teodorescu H.L. and Jain L.C., Intelligent systems and technologies in rehabilitation engineering, CRC Press, 2001.
11. Webster J.G. et al (eds.), Electronic Devices for Rehabilitation, Chapman and Hall, U.K., 1985.
12. Zollars J.A., Special Seating: An Illustrated Guide, Otto Bock Orthopaedic Industry, Inc., Minneapolis, MN, USA, 1996.

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