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>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 the use 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
- Mobility Devices
- Prosthetics and Orthotics Technology
- Evaluation and Training Technology
- 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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Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d		
1. Assignments, lab reports and/or presentations	70 %	√	√	√	√		
2. Quiz	30 %	√	√	√			
Total	100 %						

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.

Student Study Effort Expected

Class contact:	
▪ Lectures/Tutorial/Seminar	33 Hrs.
▪ Laboratories	6 Hrs.
Other student study effort:	
▪ Self-study	47 Hrs.
▪ Assignments and laboratory reports	40 Hrs.
Total student study effort	126 Hrs.

Reading List and References

1. Dejan Popovic and Thomas Sinkjaer, *Control of Movement for the Physically Disabled*, Springer, 2000.
2. MacLachlan M. and Gallagher P. *Enabling Technologies – Body Image and Body Function*, Churchill Livingstone, 2004.
3. Scherer M.J., Assistive Technology: Matching Device and Consumer for Successful Rehabilitation, American Psychological Association (APA), 2002.
4. Teodorescu H.L. and Jain L.C., Intelligent systems and technologies in rehabilitation engineering, CRC Press, 2001.
5. Daniel J. DiLorenzo, Joseph D. Bronzino, Neuroengineering, 2007.
6. Bruce F. Katz, Neuroengineering the Future: Virtual Minds and the Creation of Immortality, 2008.
7. Akay M (Editor), Handbook of Neural Engineering, Wiley, 2007.
8. Webster JG (Editor), Bioinstrumentation, John Wiley & Sons, 2009.
9. Hu XL, Intelligent Biomechatronics in Neurorehabilitation, Elsevier, 2019.