Subject Description Form

Subject Code	BME5130
Subject Title	Advanced Prosthetics and Orthotics
Credit Value	3
Level	5
Responsible staff & Department/School	Dr Aaron LEUNG (BME) & Dr M S WONG (BME)
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject aims to provide an in-depth and wide exposure of various approaches in clinical assessment, design, fabrication, fitting & outcome measure in advanced prosthetics and orthotics, to incorporate evidence-based practice by initiating discussion on a number of literatures of research, and to keep abreast with the latest development in advanced prosthetics and orthotics.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Perform comprehensive assessment, evaluation and documentation in prosthetic and orthotic service; b. Incorporate evidence-based practice in prosthetic and orthotic service; c. Organize and manage different approaches in design, fabrication, and fitting of prostheses and orthoses; d. Understand the application of the latest prosthetic and orthotic technologies.
Subject Synopsis/ Indicative Syllabus	Principles in Prosthetics and Orthotics: Patient assessment; biomechanical design of prostheses and orthoses, materials and component options; checkout and evaluation of prosthetic and orthotic interventions; clinical documentation. Advanced Technology in Prosthetics and Orthotics: Latest prosthetic and orthotic designs, application of advanced components, materials and control strategies in prostheses and orthoses, analysis of kinetic, kinematic, and spatial-temporal parameters of movement of amputees and patients; computer-aided-design and manufacturing (CAD-CAM); 3D printing applications; device-body interface measurement. Critical review of various designs of prosthetic and orthotic interventions.
Teaching/Learning Methodology	This subject extends the knowledge in prosthetics and orthotics especially in patient assessment, prescription, design, fabrication and evaluation methods. Students are also required to review the literature, to compare and contrasting traditional beliefs / experiences with findings from previous research. In laboratory sessions, students will test and report how different parameters, which include designs of prosthesis / orthosis, and physical conditions of the patients, affect the functioning of the prosthetic / orthotic interventions.

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<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
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<tr><td rowspan="2">Specific assessment methods / tasks (Continuous assessment)</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. Student Case Presentation</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Written Assignment</td><td>40%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>3. Quizzes</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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<tr><td>Student Study Effort Expected</td><td>
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<tr><td>Class contact:</td><td></td></tr>
<tr><td>Lecture</td><td>24 Hrs.</td></tr>
<tr><td>Tutorial</td><td>6 Hrs.</td></tr>
<tr><td>Laboratory</td><td>9 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>□ Self-study</td><td>39 Hrs.</td></tr>
<tr><td>□ Assignment and paper preparation</td><td>39 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>117 Hrs.</td></tr>
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<tr><td>Reading List and References</td><td>
Essential References

American Academy of Orthopedic Surgeons. Atlas of Limb Prosthetics: surgical, prosthetic, and rehabilitation principles. St. Louis, Mosby, 1992.
Douglas G.S., et al. (eds.) Atlas of Amputations and Limb Deficiencies: Surgical, Prosthetic, and Rehabilitation Principles, 3rd Edition. American Academy of Orthopaedic Surgeons, 2004.
Carroll K. and Edelstein J.E. (eds.) Prosthetics and Patient Management: A Comprehensive Clinical Approach. Thorofare, NJ: SLACK Inc., 2006.
Lusardi M.M., and Nielsen C.C. (eds.) Orthotics and Prosthetics in Rehabilitation. 3rd Edition. St Louis, Mo.: Saunders/Elsevier, 2012.
Hsu J.D. et al. (eds.) AAOS Atlas of Orthoses and Assistive Devices. 4th Edition. Philadelphia: Mosby, 2008.
Aisen M.L. Orthotics in Neurologic Rehabilitation Demos, New York, 1992.
Seymour R. Prosthetics and Orthotics: Lower Limb and Spinal. Philadelphia: Lippincott Williams & Wilkins, 2002.
Bradford D.S., Lonstein J.E., Moe J.H., Ogilvie J.W. and Winter R.B., Moe's Textbook of Scoliosis and Other Spinal Deformities, 1987.
Patwardhan A.G., Scoliosis: Making Clinical Decisions, 1989. Jacobs M. and Austin N., Splinting: the hand and upper extremity, Lippincott Williams & Wilkins, 2003.

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	10. Shurr D.G, Michael J.W., Prosthetics and Orthotics. Prentice Hall, 2002. 11. White III A.A. and Panjabi M.M., Clinical Biomechanics of the Spine,1990. Supplementary References 12. Bowker P., Condie D.N., Bader D.L. and Pratt D.J., Biomechanical Basis of Orthotic Management, 1993. 13. McRae R., Clinical Orthopaedic Examination,1990. 14. Redford J.B., Basmajian J.V. and Trautman P., Orthotics: Clinical Practice and Rehabilitation Technology, 1995. 15. Sponseller P.D. and Stevens H.M., Handbook of Paediatric Orthopaedic, 1996. 16. Hunter J. and Schneider L., Rehabilitation of the Hand: Surgery and Therapy, 1995. 17. The Hand: Examination & Diagnosis, American Society for Surgery of the Hand, 1990. 18. The Hand: Primary Care of Common Problems, American Society for Surgery of the Hand, 1990.