SUBJECT DESCRIPTION FORM

SUBJECT CODE: HTI4235

SUBJECT TITLE: Upper Limb Prosthetics

CREDITS: 2

PRE-REQUISITES: HTI2121 Introduction to Biomechanics
HTI2122 Mechanics of Tissues and Biomaterials

CO-REQUISITES: HTI3141 Orthopaedics, Traumatology and Rehabilitation
HTI3115 Bioelectrical Techno. II -Electronics

RESPONSIBLE DEPARTMENT: Department of Health Technology & Informatics

RESPONSIBLE MEMBER OF THE ACADEMIC STAFF:
Dr. M. S. WONG

CONTACT HOURS:		
	Lecture and Tutorial	21 hours
	Laboratory	21 hours
	Total Contact	42 hours

RATIONALE:
This is part of the Prosthetics Studies, which provides students with the principles and practical laboratory experiences in the prescription, design, fabrication, fitting and evaluation of prosthetic devices. The series progressively integrate the health and engineering studies, which the students have taken as part of their academic studies. Those academic studies will form the basis for the derivation of the scientific principles used in the practice of upper limb prosthetics.

LEARNING OUTCOMES:
Students will be able to carry out the following procedures, in a safe manner, according to the patients' conditions.

- To assess the patients
- To prescribe prosthetic interventions
- To take measurement on the patients
- To design appropriate prosthetic devices
- To perform the technical process
- To fit the prostheses
- To evaluate the interventions
- To communicate with the patients effectively

SYLLABUS:
Detailed review of the relevant anatomy; introduction to amputation of the upper extremity, stump management; introduction to upper limb prosthetics; clinical assessment of upper extremity amputee; materials and components; biomechanics of upper limb prosthetics; upper limb prostheses for different disorders and clinical conditions - partial hand prostheses, wrist-disarticulation prostheses, below-elbow prostheses, through-elbow prostheses, above-elbow prostheses, shoulder-disarticulation prostheses, and intrascapulothoracic prostheses; body-powered mechanical prostheses, electrical prostheses, and myoelectric prostheses; measurement,

moulding, and fabrication of upper limb prosthetics; fitting and checkout of upper limb prosthetics.

TEACHING-LEARNING METHODS:
The 21 hours of lectures and tutorials will be supported by 21 hours of demonstrations, and hands-on practical experience. The subject is to integrate the theoretical knowledge and the technical skills in a way that is important to patient care and management. In this module, students would have ample opportunities to interact directly with real amputees. Students will need to go through step by step the clinical process of patient assessment, patient measurement, casting, cast rectification, fabrication, patient fitting, and patient evaluation. Besides the development of technical skills, emphasis is placed on the development of clinical judgement and the process of clinical problem solving. Direct feedback from the professional patients/subjects at various stages, as well as from the instructors throughout the process, would constitute important inputs to the learning experience. In the process, subjects will also learn how to interact with the patients. At the end of a practical series, students will be guided to critique the work of other fellow students under the facilitation of the instructor. This is done to maximize the learning experience by learning not only from one's own mistakes but also from those of the fellow students.

ASSESSMENT:
Each of the individual learning outcomes will be assessed as part of the integrated outcome demonstrated by the student in patient care. Individual prosthetics design and fitting projects will be assessed with direct feedback from the model patients/subjects at various stages, as well as from the instructors throughout the process. In the process, students will also learn how to interact with the patients. At the completion of assigned individual projects, students will be guided to critique the work of other fellow students under the facilitation of the instructor. This is done to maximize the learning experience by learning not only from one's own experience but also from those of the fellow students.
A final examination will be used to establish that the student has understood and can integrate the factual materials required to provide upper limb prosthetics service.

Continuous Assessment	60% (must pass)
Final Examination	40% (must pass)

REFERENCE MATERIALS:

1. American Academy of Orthopedic Surgeons. Atlas of Limb Prosthetics: surgical, prosthetic, and rehabilitation principles. St. Louis, Mosby, 1992.
2. Banerjee S.N. (ed.) Rehabilitation Management of Amputees. Williams and Wilkins, 1982.
3. Bender L.F. Prostheses and Rehab after Arm Amputation. CC Thomas, 1974.
4. Day H.J.B., Kulkarni J.R. and Datta D. Prescribing Upper Limb Prostheses, 1993.
5. Hoppenfeld S. Physical Examination of the Spine and Extremities. 1976.
6. Kostuik J.P. Amputation Surgery and Rehabilitation: the Toronto Experience. Churchill Livingstone, 1981.
7. Lusardi M. M. and Nielsen C. C., Orthotics and Prosthetics in Rehabilitation, Butterworth Heinemann, 2000.
8. Murdoch G. (ed.) Prosthetic and Orthotic Practice. Arnold, 1970.
9. Northwestern University Medical School, Prosthetic-Orthotic Center. Upper Limb Prosthetics for Prosthetists, 2003.
10. Robertson E. Rehabilitation of Arm Amputees and Limb Deficient Children. Bailliere Tindall, 1978.
11. Spaeth J.P. and Klotz, J.S. Handbook of Externally Powered Prostheses for the Upper Extremity Amputation, 1981.
12. Vitali M., Robinson K.P., Andrews B.G., Harris E.E., Redhead R.G. Amputations and Prostheses. 2nd Edition. Bailliere Tindall, 1986.
13. Shurr D.G, Michael J.W., Prosthetics and Orthotics, Prentice Hall, 2002
14. Weiss-Lambrou R. A Manual for the Congenital Below-Elbow Child Amputee, 1981.