

## SUBJECT DESCRIPTION FORM

**SUBJECT CODE:** HTI4237

**SUBJECT TITLE:** Spinal Orthotics

**CREDITS:** 2

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

**CO-REQUISITES:** HTI3141 Orthopaedics, Traumatology and Rehabilitation

**RESPONSIBLE DEPARTMENT:** Department of Health Technology & Informatics

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

**CONTACT HOURS:**

Lecture & Tutorial	21 hours
Laboratory	<u>21 hours</u>
Total Contact	42 hours

### **RATIONALE:**

This is part of the orthotics studies, which provides students with the principles and practical laboratory experiences in the prescription, design, fabrication, fitting and evaluation of orthotic 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 spinal orthotics.

### **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 orthotic interventions
- To take measurement on the patients
- To design appropriate orthotic devices
- To perform the technical process
- To fit the orthoses
- To evaluate the interventions
- To communicate with the patients effectively

### **SYLLABUS:**

Detailed review of the relevant anatomy; basic biomechanics of the spine and trunk; pathomechanics of spine; introduction to spinal orthotics; clinical assessment of the spine; materials and components; biomechanics of spinal orthotics; spinal orthoses for different disorders and clinical conditions. The head orthoses, cervical orthoses, lumbosacral orthoses, thoracolumbosacral orthoses, flexible orthoses, CTLS alignment orthoses are involved. The clinical measurements, moulding, cast rectification, and fabrication of spinal orthoses; fitting and checkout of spinal orthoses are included.

**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 opportunities to interact directly with some professional patients. 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 maximise the learning experience by learning not only from one's own mistakes but also from those of the fellow students. On-line learning and teaching mode will also be used.

**ASSESSMENT:**

Each of the individual learning outcomes will be assessed as part of the integrated outcome demonstrated by the student in patient care. Individual orthotics 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 spinal orthotics service.

Continuous Assessment	50% (must pass)
Final Examination	50% (must pass)

**REFERENCE MATERIALS:**

- Berger N., Edelstein J., Fishman S., Krebs D. and Springer W., Spinal Orthotics Manual (NYU), 1983.
- Blount W.P., The Milwaukee Brace, Williams and Wilkins, 1980.
- Bowker P., Condie D.N., Bader D.L. and Pratt D.J., Biomechanical Basis of Orthotic Management, 1993.
- 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.
- Cailliet R., Scoliosis: Diagnosis and Management, 1975.
- Goldberg B. and Hsu J.D., Atlas of Orthoses and Assistive Devices, 1997.
- James J.I.P., Scoliosis, 1976.
- Lusardi M. M. and Nielsen C. C., Orthotics and Prosthetics in Rehabilitation, Butterworth Heinemann, 2000.
- McRae R., Clinical Orthopaedic Examination, 1990.
- Redford J.B., Basmajian J.V. and Trautman P., Orthotics: clinical practice and rehabilitation technology, 1995
- Patwardhan A.G., Scoliosis: Making Clinical Decisions, 1989.
- Seymour R., Prosthetics and Orthotics: lower limb and spinal, Churchill Livingstone, 2002.
- Shurr D.G. Michael J.W., Prosthetics and Orthotics, Prentice Hall, 2002
- Spinal Orthotics for Orthotists, Prosthetic-Orthotic Center, Northwestern University Medical School, 1996.
- Sponseller P.D. and Stevens H.M. Handbook of Paediatric Orthopaedic, 1996.
- White III A.A. and Panjabi M.M. Clinical Biomechanics of the Spine, 1990.