

Syllabus

Fall 2007

**Research in Prosthetics and Orthotics**

義肢與矯具學研究

Course Number: 548 M0950

Course Objective:

The research of biomedical science and engineering has advanced in recent years, which has obviously been reflected on the progress in the technical and clinical aspects of prosthetics and orthotics (P&O). This course will take students to explore some of the researchable areas in P&O. The objective of this course is to learn the background and the tools of research in P&O. The research topics will cover research fundamentals, normal human locomotion, human joint biomechanics, pathological gait and orthotic intervention, control and design of orthotic and prosthetic devices. Students will write a research proposal during the semester. The research proposal will be turned in and presented in the end of this course.

Journals:

*Prosthetics and Orthotics International*

*Journal of Biomechanics*

*Archives of Physical Medicine & Rehabilitation*

*Journal of Bone and Joint Surgery*

*Gait and Posture*

*Journal of Prosthetics and Orthotics*

*Journal of Rehabilitation Research and Development*

*Physical Therapy*

*Biomechanics: The magazine of body movement and medicine*

Software:

Endnote A book keeper for articles, manuscripts,....

## On-line Resources:

<http://www.lib.ntu.edu.tw/> National Taiwan University Library Electronic resources for journals, Medline data bases, and books.

<http://scholar.google.com.tw/> Google Scholar A search engine for academic articles

<http://portal.isiknowledge.com/portal.cgi?DestApp=WOS&Func=Frame&Init=Yes&SID=H2ld@P73EGM8L7Ecl4o> Web of Science A search engine for authors, citations, articles....

<http://cme.cancer.gov/clinicaltrials/learning/humanparticipant-protections.asp> Human Participant Protections Education for Research Teams This free, web-based course presents information about the rights and welfare of human participants in research. The two-hour tutorial is designed for those involved in conducting research involving human participants. It satisfies the NIH human subjects training requirement for obtaining Federal Funds. You will have the option of printing a certificate of completion from your computer upon completing the course.

Time: F 9:30-12:00

Classroom: 水源校區輔研中心

Instructor:

Prof. Liang-Wey Chang (章良渭), 水源校區輔研中心

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義肢與矯具學研究  
Research in Prosthetics and Orthotics (3-0)

Tentative Coverage

1. Terminology and Concepts
2. Critical Review of the Literature
3. Research Hypothesis and Design
4. Normal Human Locomotion
5. Human Joint Biomechanics
6. Pathological Gait
7. Orthotic Intervention
8. Prosthetic Design
9. Prosthetic Control
10. Research Presentation

**Course Conduct:**

Mid Term	20%
Final Exam (Presentation)	20%
Certification of Human Participant Protections Education	10%
Research Project	50%

義肢與矯具學研究  
548 M0950 Research in Prosthetics and Orthotics (3-0)

Tentative Schedule

WEEK	TOPIC (date(s))
1	Introduction; P&O research and contents (9/21)
2	P&O Cases; Terminology and concepts (9/28)
3	Literature Review and Research Design (10/05)
4	Research involving Human Subjects and Experimental Design (10/12)
5	Experiment Design: Biostatistics (10/19)
6	Functional Assessment I (10/26)
7	Functional Assessment II (11/02)
8	Human Movements I (11/09)
9	Human Movement II (11/16)
10	Mid-Term (11/23)
11	Joint Biomechanics (11/30)
12	Functional Restoration (12/07)
13	P&O Intervention (12/14)
14	The Patient-Devices Interface (12/21)
15	P&O Design (12/28)
16	P&O Control (1/04)
17	Cutting Edge Emerging Research (1/11)
18	<b><u>FINAL EXAMINATION</u></b>