Master of Science in Prosthetics and Orthotics Program
School of Applied Physiology
Georgia Institute of Technology
Spring 2013 (v7, 1-11-13)

Course No. & Title: APPH 6983. Upper Limb Orthotics

Coordinator/Instructor: Christopher Hovorka, MS, CPO, LPO, FAAOP
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Credits: 3 credit hours

Class Meeting Times/Dates:
Mondays and Tuesdays (assigned off campus clinical rotation) + Wednesdays through Fridays (on-campus class) with some exceptions, see class schedule for details

(Note: There may be some exceptions in time due to unique clinical and technical procedures and so I ask that you be flexible and open minded to possible schedule changes)

Location of Class (also see class schedule):

a.) Lecture: Seminar Room 1271 and P&O Clinical Lab

b.) Laboratory: P&O Fabrication Labs

c.) Clinical Practicum: Georgia Hand, Shoulder and Elbow (GHSE)
1819 Peachtree Road, N.E., Suite 425
Atlanta, GA 30309

Directions to GHSE - *http://www.gahand.org/contact-us/locations_piedmont.php*

Honor Code:
Honesty is expected of all students in the MSPO program. For additional information about the Honor Code and for a complete copy of the text go to the Georgia Tech On-Line Catalog at *http://www.honor.gatech.edu*

Honor Pledge:
All students are required, when requested, to attach the following statement to any material turned in for a grade in any course in the MSPO education program. ***"On my honor, I pledge that I have neither given nor received inappropriate aid in the preparation of this assignment."***

Course Description:
The physical, functional and (some portions of psychological) deficits of upper limb physical impairment will be investigated and will include topics in: the causes and levels of clinical pathology resulting in functional impairments and/or movement impairment of the fingers and/or, hand and/or, wrist and/or, forearm and/or, elbow and/or, proximal arm and/or, shoulder and/or scapulohumeral joints.

Students will engage in the process of patient assessment (involving patient history taking, physical examination), formulation of a treatment plan and delivery of a treatment plan. The process of creating and fitting upper limb orthoses as part of a treatment plan for persons will include: history and physical examination, formulation of the orthotic prescription recommendation, the measurement, impression taking (casting), positive model creation and rectifications, thermoforming, assembly, static and dynamic fitting, normal and pathomechanical movement analysis, and adult (geriatric), pediatric, and sports considerations of upper limb impairments will be investigated and applied.

Oral presentation and written handout assignments include: patient history and physical examination, overview of clinical pathology, clinical case study, patient/orthosis fitting, orthotic prescription recommendation, third party billing considerations, and literature reviews.

Technical assignments will include patient history taking, physical examination, assessment and measurement of neuromusculoskeletal function. Students will utilize a variety of instruments to assess patient neuromusculoskeletal function and tools/machinery including orthotic components to fabricate custom molded orthoses and to alter custom fit upper limb orthoses and subsequently apply the principles discussed/demonstrated in lecture and laboratory. Models and human subjects will be evaluated, measured, cast, and fit with a variety of upper limb orthoses.

Relationship to the Curriculum Design:
This course expands upon the foundation biomechanics, kinesiology, human pathology and general clinical patient assessment knowledge and skills developed in the first three (3) semesters of the MSPO program. These knowledge and clinical/technical skill domains are expanded in this course in order to develop entry-level competency as an orthotist.

Course Goals:
1. Students will formulate and implement a safe and effective upper limb orthotic treatment plan using various approaches of measurement and impression taking as part of the process for selection and/or creation of orthosis designs
2. Students will assess a patient (in a rehabilitation clinic) who has an upper limb pathology and will formulate and present an optimal clinical rehabilitation management approach

Course Objectives:
The course objectives are the same as outlined in syllabi for lower limb orthotics and spinal orthotics courses as they relate to the upper limb.

Teaching/Learning Experiences:
These are the same as outlined in syllabi for lower limb orthotics and spinal orthotics courses.

Evaluation Methods (include Weighting):
50% - Examinations covering didactic and clinical applied theory and procedures
33% - Clinical/Technical Proficiency (patient assessment, measurement, impression taking, problem solving, technical design, fabrication, alignment and fitting of upper limb orthoses)
17% - Presentation of a person with clinical pathology affecting upper limb(s)

Instructional Methods:
Lecture, laboratory and clinical rotation experience incorporating theoretical and applied demonstrations, models, human subjects and technical fabrication assignments.

Independent Assignments:
These assignments are designed to enhance the student's problem solving and organizational skills and to enhance their abilities in communication. They are also designed to develop core knowledge and skills required in the management of patients with upper limb dysfunction.

a.) Readings
Students are required to complete all collateral readings in advance of lectures/laboratories. The instructor will highlight concepts that are presented in assigned readings.

b.) Fabrication/Fit/Alignment of Orthoses
Students will evaluate patient models (classmates at Ga Tech and persons with clinical pathology at GHSE) and will fabricate and fit a variety of orthoses.

c.) Oral Presentation/Written Handout
Students will be required to formulate and deliver an oral presentation and provide a written handout of an assigned clinical pathology that may require treatment with an upper limb orthosis (see "Presentation: Optimizing Clinical Judgment Factors").

OUTLINE FOR PRESENTATION:
OPTIMIZING CLINICAL JUDGMENT FACTORS (Clinical Case Study)
15 MINUTE Presentation should cover the following topics and answer clinical-practice relevant questions (detailed below)
Note: Students should provide written handout for all audience members. The handout should contain all essential information from the presentation and a complete list of references.

I. Incidence of the condition
- How often will an orthotist encounter the condition?

II. Etiology/Pathophysiology of the condition
- What should the orthotist understand about the condition and its impact upon relevant systems of the body?

III. Description of the signs and symptoms
- What are the most important limitations in function due to the condition?

IV. Medical management of the condition
- How is the condition optimally treated?

A. Goals and objectives of treatment
- What are the main goals and objectives of treatment?

B. Biomechanical controls of orthosis design(s)
- What is the ideal limb/joint alignment?
- How and in what manner should forces be applied upon the limb by the orthosis?
- Which of the seven (7) orthotic biomechanical controls that should be applied in the orthosis design?

C. Detailed description of orthosis design(s) and implementation plan
- How do you create the optimal orthosis and what does it look like?

D. Patient education and follow up plan
- How do you optimally manage the patient to utilize the orthosis to ensure the desired treatment outcome?

E. Billing codes and rationale
- What is your itemized bill for services and what is the justification to defend your treatment plan to the third party payer?

V. Prognosis
- What research supports your approach to assessment and treatment of the patient?
- Be prepared to comment on the strengths and weaknesses of the evidence

VI. References
- Report all reference citations, borrowed images, etc. according to the format in the Journal of Prosthetics and Orthotics in any issue on or after 2010

GRADING OF PRESENTATION
A grading form will be provided

GRADING OF UPPER LIMB ORTHOSES FABRICATION AND FITTING ASSIGNMENTS
An evaluation and grading form will be provided

WEIGHT OF EACH ASSIGNMENT IN OVERALL COURSE GRADE:

Type of assignment	Number of Assignments	Points	Total	% Grade
Fabricate/fit/align upper limb orthoses:				
Custom molded low temp plastic WHO/WHFO (Jan 10)	1	50	50	~6
Custom molded high temp plastic WHO (Jan 23)	1	150	150	~17
Custom fit plastic articulated EWHO (Jan 24)	1	50	50	~6
Fit/align prefab orthoses: (arm slings, Fx orthosis, SEWHO, WHFO, etc.) (Jan 28)	1	50	50	~6
Quizzes (Written) (Jan 9, 10, 11, 18, 24)	6	25	150	~17
Presentation: Optimizing Clinical Judgment Factors (Jan 29)	1	150	150	~17
Final Exams (written, oral, practical) (Feb 1)	3	100	300	~33
TOTAL			900	

Course Grade	Percentage	Points
A	(90-100%)	≥765
B	(80-89%)	680-764
*C	(70-79%)	585-679
D	(60-69%)	510-584
F	(<60%)	<510

*Overall course grade lower than C is unsatisfactory. Consult the MSPO student handbook regarding final course grade lower than C and the ramifications.

Required Clothing, etc.:

- Laboratory coat
  Landau Style #3163 WWT (white, 65% polyester, 35% cotton) ¾ length

Required Tools:

- Clinical and Fabrication tools are assigned to each student by Georgia Tech. Each tool must be returned at the end of semester – any items damaged beyond reasonable use and/or any lost items are to be replaced with equivalent quality tools, etc. at the student's expense

Required Supplies:
The necessary supplies for this course will be provided by Georgia Tech

All required clothing and most clinical tools (if student prefers unique tools) are available for purchase at: Engineers Bookstore, 748 Marietta Street NW, Atlanta, GA 30318 Phone: 404-221-1669, web site: www.engrbookstore.com

Required Liability Insurance:
Professional Liability (Malpractice) Insurance is provided for each MSPO student as part of a group plan with the broker, Seabury & Smith of Chicago, IL

Required Health Insurance:
Proof of medical insurance is required. Students who do not possess an accident/sickness/health policy are responsible for payment for any medical services rendered.

REQUIRED TEXTBOOKS:

1. **(provided as PDF)** Sieg KW, Adams SP. Illustrated Essentials of Musculoskeletal Anatomy. Gainesville, Florida; Megabooks; 2002 ISBN 0935157042

2. (**student responsibility**) Neumann DA. *Kinesiology of the Musculoskeletal System Foundations for Physical Rehabilitation.* 2nd ed. St. Louis: Mosby; 2010 ISBN 9780323039895

3. (**student responsibility**) Coppard BM, Lohman H. *Introduction to Splinting A Clinical Reasoning & Problem Solving Approach.* 3rd ed. St. Louis: Mosby Elsevier; 2008. ISBN 9780323033848

4. (**student responsibility**) Hsu JD, Michael JW, Fisk JR. *AAOS Atlas of Orthoses and Assistive Devices*. 4th ed. Philadelphia: Mosby Elsevier; 2008. ISBN 9780323039314

5. **(provided as PDF)** Sarmiento A, Latta LL. *Functional Fracture Bracing A Manual*. Philadelphia: Lippincott Williams & Wilkins

Note:

- *The above textbooks will also be available on TWO HOUR RESERVE at the Georgia Tech Price Gilbert Memorial Library*
- *Other readings from textbooks or journals may be assigned as announced*

ADDITIONAL RESOURCES THAT PROVIDE GOOD REFERENCE:

Norkin CC, White DJ. *Measurement of Joint Motion A Guide to Goniometry*. 3rd ed. Philadelphia: F.A. Davis Company; 2003. ISBN 0803609728

Kendall FP, McCreary EK, Provance PG, Rodgers MM, Romani WA. *Muscles Testing and Function with Posture and Pain*. 5th ed. Philadelphia: Lippincott Williams & Wilkins; 2005.

Field D. *Anatomy Palpation & Surface Markings.* 3rd ed. Oxford: Butterworth Heinemann; 2002 ISBN 0750646187

Moore KL, Dalley AF. *Clinically Oriented Anatomy*. 4th ed. Baltimore: Lippincott Williams & Wilkins; 1999. ISBN 0683061410

COURSE CALENDAR:

***Course Instructor reserves the right to change or modify content & schedule presented in this course**

****Note Rot= Clinical Rotation off campus at Georgia Hand, Shoulder and Elbow (GHSE)**
C = Class in School of Applied Physiology Building

Class	Date Time Notes	Topics and Activities	Instructor Location Reading
Rot1	Jan 7 Mon	Clinical Rotation at Ga Hand, Shoulder, Elbow (GHSE) (**Gloria Cho, Rebecca Patterson**)	Dan Acker GHSE, Midtown, Atlanta
Rot2	Jan 8 Tues	Clinical Rotation at Ga Hand, Shoulder, Elbow (GHSE) (**Joseph Azzarello**)	Dan Acker GHSE, Midtown, Atlanta
Cls1	Jan 9 Wed 10:00-5:30 All-bring loose fitting t-shirt and lab coat Women - wear athletic bra or jog bra Men – be prepared to remove your shirt	10:00-10:45 Lecture: **Course Introduction** ▪ Course overview and review syllabus ▪ Discuss assignments 10:45 –12:00 Lecture/Clinical Lab: **Workshop 1 of 3 (Elbow/Forearm, Quiz #1):** ▪ Introduce guest instructor ▪ 3-Day workshop overview ▪ Introduction to OT profession ▪ Interdisciplinary communication of OT and P&O to optimize patient care ▪ Terminology ▪ Overview anatomy and surface landmarks	Chris Hovorka Dan Acker Scott French Morning – Seminar Room 1271 Afternoon - Room TBA *1.) (*PDF) *Illustrated Essentials of Musculoskeletal Anatomy,* 4th ed. p. xi-xiii, 6-10, 25-45, 63-64, 67-70

		12:00-1:00 School of AP Brown Bag Lunch Seminar (in Auditorium) 1:00-3:15 Lecture/Clinical Lab: Elbow and Forearm ▪ Anatomical structures (continued) – bones, ligaments ▪ Overview arthrokinematics ▪ Overview muscles powering the elbow and forearm ▪ ROM and muscle testing ▪ Common pathologies ▪ Overview of treatments of pathologies 3:15-3:30 Break 3:30-4:45 Lecture/Clinical Lab: Complete elbow/forearm 4:45-5:30 Wrap Up and Quiz #1 (elbow/forearm)	*2.) Kinesiology of the Musculoskeletal System* Ch 6: Elbow and Forearm, p. 173-215 Focus readings in the chapter on the figures and tables since they provide a good summary of main points covered.
Cls2	Jan 10 Thurs 9:00-5:30 (this class may end early) All-bring loose fitting t-shirt and lab coat Women - wear athletic bra or jog bra Men – be prepared to remove your shirt	**Workshop 2 of 3 (Hand, Digits, Wrist, Splinting Lab, Quiz #2):** 9:00-12:00 Lecture/Clinical Lab: Hand and Digits ▪ Overview of anatomy and surface landmarks ▪ Overview of hand biomechanics ▪ Grasp and pinch patterns ▪ ROM and muscle testing (digits) ▪ Highlight some representative pathologies affecting the hand 12:00-12:30 Lunch 12:30-3:00 Lecture/Clinical Lab: Wrist ▪ Overview of anatomy and osteokinematics ▪ Overview of anatomy and surface landmarks ▪ Overview of wrist biomechanics ▪ ROM and muscle testing ▪ Highlight some representative pathologies affecting the wrist 3:00-4:00 Low Temp Orthoses Clinical/Technical Fabrication Lab: Custom low temperature thermoplastic orthosis fabrication and fitting lab	Chris Hovorka Dan Acker (Dan needs to leave at 4:00 p.m.) Seminar Room 1271 *1.) (*PDF) *Illustrated Essentials of Musculoskeletal Anatomy*, 4th ed. p. xi-xiii, 6-10, 28-57, 68-73 *2.) Kinesiology of the Musculoskeletal System* Ch 7: Wrist p. 216-243 Ch 8: Hand p. 244-297 Focus readings in the chapter on the figures and tables since they provide a good summary of main points covered. (PDFs): *3.) Introduction to Splinting*, 3rd ed. Ch 1: Foundations of Splinting, p. 3-14 Ch 3: Splinting Processes, Tools, and Techniques, p. 29-52 4.) (PDF) Custom Low Temperature Finger/Thumb/Hand Splint Evaluation and Grade Form

		4:00-4:15 Break 4:15-4:45 **Quiz #2** (hand, digits, wrist, splinting)	
Cls3	Jan 11 Fri 10:00-6:15 This class will end later than usual All- bring loose fitting t-shirt and lab coat Women - wear athletic bra or jog bra Men – be prepared to remove your shirt	**Workshop 3 of 3 (Conclude Splinting, Brachial Plexus, Upper Quarter, Shoulder, Quiz #3 & #4):** 10:00-10:30 Wrap Up Clinical/Fabrication Lab: Discussion and Wrap UP How to correct the fit of upper limb orthoses Evaluate each student's FO and WHO low temperature plastic splints and grade fit/function 10:30-12:30 Lecture/Clinical Lab: ▪ Nerves of the upper limb (peripheral nerves, brachial plexus) ▪ Common nerve pathologies ▪ Common orthotic interventions for nerve pathologies 12:30-1:00 Lunch 1:00-5:00 Lecture/Clinical Lab: Upper Quarter and Shoulder ▪ Overview of shoulder/upper quarter anatomy and surface landmarks ▪ Overview of shoulder/upper quarter biomechanics ▪ ROM and muscle testing (shoulder/upper quarter) ▪ Overview of common pathologies to the shoulder/upper quarter ▪ Clinical examination, therapeutic exercise and other treatments 5:00-5:30 Wrap up and review for Quiz #3 and #4 5:30-6:15 **Quiz #3** (brachial plexus), **Quiz #4** (upper quarter/shoulder)	Dan Acker Chris Hovorka Seminar Room 1271 and P&O Clinical Lab *1.) (*PDF) *Illustrated Essentials of Musculoskeletal Anatomy,* 4th ed. p. xi-xiii, 4-27, 58-68, 73-79 *2.) Kinesiology of the Musculoskeletal System* Ch 5: Shoulder Complex p. 121-172 Focus readings in the chapter on the figures and tables since they provide a good summary of main points covered. *2.) (*PDF) *Illustrated Essentials of Musculoskeletal Anatomy,* 4th ed. Focus on brachial plexus and peripheral nerves of the upper limb, p. 73-79.
Rot3	Jan 14 Mon	Clinical Rotation at Ga Hand, Shoulder, Elbow (GHSE) (**Tim Kunz, Scott Thach**)	Dan Acker GHSE, Midtown, Atlanta
Rot4	Jan 15 Tues	Clinical Rotation at Ga Hand, Shoulder, Elbow (GHSE) (**Darren Bolger, Kier Book**)	Dan Acker GHSE, Midtown, Atlanta
Cls4	Jan 16 Wed 9:00-5:30 This class	**Principles of ULOs, WHO - Evaluate, Cast, Pour, Strip** 9:00-9:30 Lecture: Review Quiz #3 and #4 results and address any questions	Chris Hovorka Scott French (availability TBD due to assist with LLO II course) Morning - Seminar Room 1271

	may go overtime so be prepared for a long day Bring loose fitting t-shirt and lab coat	9:30-12:00 Lecture: Overview of Upper Limb Orthotics ▪ Orthosis designs, force applications and other treatment principles ▪ Orthoses as treatment for common pathologies affecting the upper limb 12:00-12:30 Lunch 12:30-5:00 Clinical Lab and Fabrication Lab: Patient model evaluation and casting for WHO ▪ Demonstration by instructor ▪ Students evaluate and cast each other's dominant upper limb for WHO ▪ (Cast wrist/hand in functional position, 3-jaw chuck prehension, forearm pronated) ▪ Assemble cast ▪ Pour cast ▪ Strip exterior cast (do not leave exterior cast on overnight because it will be very difficult to strip the following day) ▪ All students' casts MUST be stripped and ready for modification by end of today *5:00-5:30 Lab clean up *(*this class may go overtime due to variability in student casting progress*)	Afternoon – P&O Clinical and Plaster Labs *1.) Atlas of Orthoses and Assistive Devices*, 3rd ed. Ch 12: Biomechanics of the Upper Limb, p. 169-178 Ch 13: Principles and Components of Upper Limb Orthoses, p. 179-190 Ch 21: Orthoses for Overuse Disorders of the Upper Limb, 287-296 2.) (PDF) Patient Examination and Impression Taking for an EWHO (Handbook) – focus on WHO 3.) (PDF) WHO Positive Model Rectification (Handbook) 4.) (PDF) WHO Evaluation and Grade Form
Cls5	Jan 17 Thurs 9:00-5:30 Wear scrubs and loose fitting t-shirt and lab coat	**WHO - Rectify, Vacuum Form** 9:00-10:00 Lab Discuss and demonstrate (if needed) WHO positive model rectifications 10:00-2:30 Lab Students rectify WHO positive models Lunch is taken when each student has available time 2:30-3:00 Lab Demonstrate vacuum forming WHO utilizing 5/32" copolymer 3:00-5:30 Lab Students vacuum form WHO using 5/32" copolymer	Chris Hovorka Scott French P&O Plaster, Thermoforming Labs Seminar Room 1271 (for Quiz #5) 1.) (PDF) WHO Positive Model Rectification (Handbook) 2.) (PDF) WHO Evaluation and Grade Form

		▪ WHO positive models MUST be vacuum formed before end of day	
Cls6	Jan 18 Fri 10:00-5:30 Wear scrubs and loose fitting t-shirt and lab coat	**WHO - Align, Contour, Install Wrist Joint, Quiz #5** 10:00-10:45 Wrap up and **Quiz #5** (orthosis designs and orthoses as treatment for upper limb pathologies) 10:45-11:15 Lab Review orthotic ulnar side wrist joint alignment, side bar contouring and installation principles 11:15-2:00 Lab Students align orthotic wrist joint, contour side bars, install side bars Lunch Eat lunch according to available time 2:00-3:00 Lab: Instructor demonstrates fitting articulated WHO to a patient model 3:00-5:00 Lab: Students complete metal contouring/installation and begin initial fitting of WHO 5:00-5:30 Lab clean up ▪ All students' MUST have wrist joint and side bars contoured and installed by end of today	Chris Hovorka Scott French P&O Thermoforming, Grinding, Assembly and Clinical Labs 1.) (PDF) WHO Positive Model Rectification (Handbook) 2.) (PDF) WHO Evaluation and Grade Form
Rot4	Jan 21 Mon	Martin Luther King Holiday Clinical Rotation at Ga Hand, Shoulder, Elbow (GHSE) **(David Spain)**	Dan Acker GHSE, Midtown, Atlanta
Rot5	Jan 22 Tues	Clinical Rotation at Ga Hand, Shoulder, Elbow (GHSE) (**Joshua Kessler, Chas Hoppe**)	Dan Acker GHSE, Midtown, Atlanta
Cls7	Jan 23 Wed 9:00-5:30 Students should wear the WHO that they are fit with for the remainder	**WHO – Finish, Fit, Grade, Assess Motion Controls, Lessons Learned** 9:00-12:00 Lab: Trim, finish and fit articulated WHO 12:00-1:00 School of AP Brown Bag Lunch Seminar (in Auditorium)	Chris Hovorka Scott French (availability TBD due to assist with LLO II course; also he needs to leave by 5 pm) P&O Thermoforming, Grinding, Assembly and Clinical Labs 1.) (PDF) WHO Evaluation and Grade Form

	of the day and until the next class	1:15-4:00 Lab: **Final graded fittings of WHO** (20 minute assessment of each type of biomechanical motion control design) • Wrist hold • Wrist flexion stop • Wrist extension stop • Wrist free • Wrist extension resist • Wrist flexion resist • Wrist adjustable ROM stop (ratchet) • Wrist adjustable ROM stop (dial and screw) 4:00-5:00 Lecture/Lab: Lessons Learned: WHO Fabrication, Fitting Discuss problems, challenges or other lessons learned to achieve optimal fit of the WHO • Students wear their WHO from end of day until tomorrow's class • formulate a list of comments regarding fit • research 1 clinical pathology indication and 1 contraindication for their assigned articulated WHO biomechanical motion control device • prepare to report on your findings tomorrow (cover any sharp edges or prominences on WHO to prevent injury during prolonged wear) 5:00-5:30 Lab clean up	
Cls8	Jan 24 Thurs 9:00-5:30 Wear your WHO and bring to class Wear or bring scrubs and loose fitting t-shirt and lab coat	**Finish WHOs, EWHO Fit/Grade, Quiz #6** 9:00-11:00 Lecture: **Wear Feedback and Clinical Indic./Contraindic. of Articulated WHOs:** ▪ 10 minutes each (maximum) ▪ Students discuss wearing experience of the WHO and report on indication/contraindication of assigned WHO design 11-12:15 Lecture: ▪ Overview of EWHO and arm sling designs and treatment indications, contraindications 12:15-12:45 Lunch	Chris Hovorka Scott French Scott French needs to leave at 5 p.m. Morning – Seminar Room 1271 Afternoon - P&O Grinding, Assembly and Clinical Labs Seminar Room 1257 (Quiz #6) *1.) Atlas of Orthoses and Assistive Devices*. 3rd ed. Ch 17: Orthoses for the Arthritic Hand and Wrist, p. 227-247 Ch 19: Functional Bracing of Selected Upper Limb Fractures, p. 261-269 2.) (PDF) Brinckmann P, et al. Locating the axis of rotation when fitting an elbow orthosis. *Prosthet Orthot Int* 2007:31:1:36-44

		12:45-4:45 Lab: EWHO Fitting and Evaluation ▪ Demonstrate diagnosing how to adjust the EWHO for appropriate fit (unfinished EWHO #1) ▪ Demonstrate assembly and proper fit of EWHO and Arm Sling to a patient model (finished EWHO #2) ▪ Students assess fit and diagnose EWHO to patient models ▪ Students adjust EWHO to match appropriate dimension and function to patient model ▪ Students fit EWHO and arm sling to a patient model ▪ Final graded fitting of EWHO and arm sling (10 minute individual appointments with instructor) 4:45-5:00 Break 5:00-5:30 Wrap up and **Quiz #6**	3.) (PDF) Hijmans JM, et al. Elbow orthoses: a review of the literature. *Prosthet Orthot Int.* 2004:28:263-272 4.) Parent-Weiss N, et al. Static progressive forearm rotation contracture management orthosis. A study of 28 patients. *J Prosthet Orthot* 2006:18:3:63-67. (**Accessible on line**) 5.) (PDF) Fabrication of the EWHO: Arm Section and Elbow Joint (Handbook) 6.) (PDF) Custom Fit EWHO Evaluation and Grade Form 7.) (PDF) Arm Sling Application Instructions 8.) (PDF) EWHO Fitting Instructions
	Jan 25 Fri	**Residency Workshop for 2nd Year MSPO Students (NO ULO CLASS)**	
Cls9	Jan 28 Mon 9:00-5:30 Wear or bring scrubs and loose fitting t-shirt and lab coat Each student selects an upper limb orthosis to wear for the remainder of the day and night and be prepared to discuss fit experience tomorrow	**Graded Fit Prefabricated (Custom Fit) ULOs** 9:00 – 12:00 Lecture: Overview of pathologies involving the upper limb due to central and peripheral nerve disorders and other traumas including principles of orthotic treatment 12:00-1:00 Lunch 1:00-2:15 Lecture: Prefabricated upper limb orthoses – ▪ Overview of various orthosis designs, indications, contraindications, fitting procedures ▪ Mobile Arm Support ▪ FO, WHO, WHFO ▪ Short opponens ▪ Long opponens ▪ Antispasticity resting ball splint ▪ Graded tension articulated joint orthosis designs (Ultraflex and similar designs) ▪ Counterforce orthosis (EO) ▪ Tenodesis orthosis (WHO) w/ wrist ratchet and telescoping adjustable wrist ▪ Humeral fx orthosis ▪ SEWHO (Gunslinger and Airplane alignments)	Chris Hovorka Scott French (Ben Lucas has TT course so machine room and assembly lab will be shared with 1st year MSPO students today) Morning - Seminar Room 1271 Afternoon – P&O Grinding, Assembly and Clinical Labs 1.) (PDF) *Functional Fracture Bracing A Manual* Introduction, p 1-11 Ch 1: Functional Bracing of Diaphyseal Humeral Fractures, p. 12-63 Ch 2: Functional Bracing of Diaphyseal Ulnar Fractures, p. 66-78 Select readings on management of both bone forearm fractures, etc. p. 150-156 and 163-173

		2:15-5:30 Lab: **Graded fit of prefabricated ULOs** ▪ WHOs: ▪ Wrist Cock Up Splint (WHO) ▪ Short and long opponens WHO ▪ Articulated WHO "Tenodesis" w/ wrist ratchet and telescoping adjustable wrist ▪ Fx Orthosis: ▪ Humeral Fx Orthosis ▪ SEWHO (Gunslinger and Airplane)	*2.) Introduction to Splinting*, 3rd ed. Ch 11: Mobilization Splints: Dynamic, Serial Static and Static Progressive Splinting, p. 235-244 Ch 14: Antispasticity Splinting, p. 308-329 *3.) Atlas of Orthoses and Assistive Devices*. 3rd ed. Ch 14: Upper Limb Orthoses for the Stroke and Brain Injured Patient, p. 191-202 Ch 16: Upper Limb Orthoses for the Person with Spinal Cord Injury, p. 203-217 Ch 20: Protective Equipment to the Upper Limb in Sport, p. 271-285 4.) (PDF) Custom Fit Orthoses Evaluation and Grade Form 5.) (PDF) Tips on Fitting Pre-Fab Upper Limb Orthoses
Cls10	Jan 29 Tues 9:00-5:30 Dress professionally	**Prefab ULOs Wear Feedback** **Student Presentations - Optimizing Clinical Judgment Factors** **Final Exams Review** 9:00-9:45 Each student briefly discusses wearing experience of a prefab ULO from the previous day 9:45-11:30 Student Presentations 11:30-1:00 Lunch 1:00-4:30 Student Presentations 4:30-5:30 Final Exams Review	Dan Acker Chris Hovorka Seminar Room 1271 1.) Presentation Grade Form
	Jan 30 Wed	No Class – Preparation for Final Exams	
	Jan 31 Thurs	No Class – Preparation for Final Exams	
Cls11	Feb 1 Fri 9:00-6:00 Dress professionally	**Comprehensive Final Exams** a.) Written Exam (9:00-11:30) (Rm 115) (include questions from student presentations of optimizing clinical judgement factors) b.) Oral & Practical Exams (12:30-6:00 p.m.) by appointments (Rm 115 & 117) c.) Course evaluation – at conclusion of practical exam	Chris Hovorka Scott French Written Exam – Seminar Room 1271 Oral and Practical Exams – Rooms TBA

Cls 12	Feb 8 Fri 10:00-12:00	**Final Exams Results** Distribute graded final exams, review students' performance, discuss strategies for utilizing knowledge/skills in future clinical practice	Chris Hovorka Seminar Room 1271