

Oklahoma State University Institute of Technology
Face-to-Face Common Syllabus
Summer 2018

OPT 1204 - UPPER EXTREMITY PROSTHETICS

Students review kinesiology, biomechanics, and nervous supply of the upper extremity; and practice safe lab procedures and material utilizations for varying designs of upper extremity prosthetic fabrication. Lecture is given on all levels of upper extremity amputation, conventional, principles of fabrication and harnessing. Repair/replacement and design criteria are covered, as are transhumeral and transradial external power components and techniques of fabrication and utilization properties of each.

Type of course: *Theory/Lab*

Credit Hours: 4; Total hours of theory per semester: 25;
Total hours of lab for the semester: 75; Total hours of clinical per semester: 0.

Class length - Full Semester

Class days and times: *Tuesday/Thursday 8:30 a.m. – 11:50 a.m.*

Prerequisites: *None*

Instructor Name: Michael P. Madden

Instructor Phone: (918) 293-5320

Office: HTED; Lab

Instructor email: mike.madden@okstate.edu

Contact: My preferred method of contact is e-mail. Please allow 24-48 hours to return your correspondence during the normal work week.

Instructor's Office Hours: Monday – Friday; 8:00 a.m. – 12:00 a.m.; 1:00 p.m. - 4:00 p.m.

School Name: Nursing and Health Sciences

Schools Main Phone: 918-293-5337

REQUIRED TEXT, REFERENCES, AND MATERIALS

Required: Shurr, Donald and John Michael. *Prosthetics and Orthotics*.

Sieg, Kay and Sandra Adams. *Illustrated Essentials of Musculoskeletal Anatomy*.

References: Goldberg, Bertam and John Hsu. *Atlas of Orthoses and Assistive Devices*.

Visible Body: <http://www.visiblebody.com>

Materials: N/A

Uniform/Tools: *Optional*

Upon completion of the course, students should:

Objectives	Assessment Method
Students will be able to:	
1.1 Identify bones of the skeletal system	Final Exam (F)
1.2 Identify major muscles of the skeletal system	Final Exam (F)
1.3 Identify major pathologies of the musculoskeletal system	Final Exam (F)
2.1 Utilize forms to modify models to correct measurements	Lab Project (F)
2.2 Utilize forms to assemble orthotic and prosthetic devices to correct measurements	Lab Project (F)
3.1 Wrap demonstration models to obtain impressions	Lab Project (F)
3.2 Repair and fill impressions with plaster	Lab Project (F)
3.3 Modify and finish models in preparation for fabrication activities	Lab Project (F)
4.1 Demonstrate the proper use of all machinery as described in the Machine Lab Safety Manual	Instructor Observation (F)
4.2 Wear safety glasses while using hand and power tools	Instructor Observation (F)
4.3 Utilize the appropriate personal protective equipment while using hazardous materials	Instructor Observation (F)
11.4 Summarize the characteristics, advantages, and disadvantages of major categories of transradial sockets	Quiz (F)
12.3 Summarize characteristics, advantages, and disadvantages of transradial suspension options	Final Exam (F)
13.1 Identify motions used in upper extremity body powered control systems	Quiz, Final Exam (F)
13.2 Identify the parts and functions of a Northwestern Figure 8 harness	Quiz (F)
13.3 Identify the components of a myoelectric control system	Final Exam (F)
14.1 Summarize the characteristics, advantages, and disadvantages of the major categories of upper extremity terminal devices	Quiz, Final Exam (F)

15.2 Bubble-form plastic over a prosthetic model with minimal wrinkles and artifacts	Lab Project (F)
15.2 Finish test socket with smooth trim lines and negligible damage to plastic	Lab Project (F)
17.1 Select and apply prosthetic textiles to a model	Lab Project (F)
17.2 Apply laminate to a prosthetic lay-up under vacuum	Lab Project (F)
17.3 Finish socket with negligible damage to lamination	Lab Project (F)
19.1 Construct a Northwestern Figure 8 harness	Lab Project (F)
19.2 Harness a transradial prosthesis to an upper extremity model	Lab Project (F)
19.3 Construct and apply a Bowden single control cable system to a transradial prosthesis	Lab Project (F)

Aspects of the course objective assessments may be used in the university's assessment of student learning. If applicable, an asterisk (*) above indicates this course is used in the university assessment program.

(Please asterisk the assignment above if utilized for the assessment assignment.)

COURSE ACTIVITIES

In this course students will:

- Develop communication skills required to function within a professional facility.
- Participate in lectures and class discussions.
- Participate in guest lecture discussions.
- Participate in oral presentations.
- Participate in reading and research assignments.
- Conduct academic research (open UE prosthetic technical topic) and present research to the class.
- Understand and implement ALL safety procedures within O/P lab.
- Consider lab and machinery safety in relation to fabrication of UE prostheses.
- Demonstrate professional behavior in lab situations.
- Complete UE prosthetic fabrication projects safely and expediently.
- Construct UE prostheses in keeping with techniques and principles of fabrication presented.
- Recognize differing designs, materials and components available in prosthetic fabrication.
- Demonstrate ability to select appropriate material and components.
- Understand properties of materials and components relating to patient size and activity levels.
- Use vertical alignment jig and associated tools to transfer and complete UE designs.
- Understand appropriate terminal devices for various needs and activities.

- Prepare and complete negative mold into positive model.
- Modify positive plaster models as dictated by specific criteria.
- Demonstrate ability to determine appropriate lay-up constructs in socket fabrication.
- Practice appropriate adjustment and repair techniques to UE prostheses.
- Demonstrate appropriate check out of prosthesis prior to delivery.
- Demonstrate appropriate inventory control of the lab.

EVALUATION - GRADES WILL BE BASED ON THE QUALITY AND COMPLETION OF THESE TASKS: *(NOTE-Please indicate the course specific evaluations.)*

- 30% Quizzes/Tests/Exams
- 60% Fabrication Projects*
- 10% Homework and Research Projects (if assigned)

OSUIT Grading Scale	
A	= 90% -100%
B	= 80% -89%
C	= 70% -79%
D	= 60% -69%
F	= 59% & below

*The student’s grade for this assignment will be used in the university’s assessment of student learning. A 70% competency or higher receives a Pass rating. This Pass/Fail rating is independent of the student’s course grade.

Daily and/or weekly quizzes, small weekly assignments and similar type projects: Normal return time to student by next class meeting or no later than one (1) week.

Extensive assignments, large lab projects, extensive quizzes, exams and similar type projects: Normal return time to students in one (1) to two (2) weeks.

AUTHORIZED TOOLS

Students may use any/all course materials, including books and notes, while participating in classroom activities. All quizzes and written assignments are to be completed independently; no collaboration with classmates is permitted and any instance of such will be considered academic dishonesty.

LATE WORK

All work (projects, reports and presentations) must be submitted by 11:50 a.m. on the day it is due. Due dates for work is on your outline, so there should be no surprises. Late work will be penalized 5% for every day it is late. Work is considered late after 11:50 a.m. on the day it is due unless I advise you otherwise, or you have an excused absence on the due date. No tests, assignments, presentations or papers will be accepted after 3 days of original due dates. I reserve the right to modify this policy depending on individual circumstances.

TESTING

Tests may be administered in person or online through D2L. Please make arrangements in advance if you know you will miss a scheduled test. The availability of make-up exams for unexcused absences will be at the instructor's discretion.

CLASSROOM AND LAB CONDUCT

An instructor or member of the OSUIT staff must be present when students are working in the lab. Only students in the program are allowed in the lab. Use of the machine labs is not allowed until students complete the Lab and Machine Safety Checkout. Professional behavior is expected in the classroom and the labs at all times. Use of profane and sexually based language will not be tolerated.

Students may wear scrubs or casual clothing appropriate for working in the lab. No open toed shoes, high heels or sandals are allowed. All shirts must have sleeves. No ties, long necklaces or any other potentially dangerous items that could cause injury to the student or others are allowed in the lab. Hair longer than the collar must be tied back while working in the lab.

DRESS CODE (REQUIRED)

Field trips, seminars and guest speakers: Casual Professional

For women, this means blouses and pants, skirts or dresses. The hemlines of dresses and skirts must fall below the knee. Blouses must have sleeves and cover the midriff (no tube tops, t-shirts, tank tops or transparent fabrics). For men, this means slacks and sport shirts (no sleeveless shirts or t-shirts). For both sexes, casual dress shoes are required (no sandals). No head covers are allowed.

Lab: Scrubs or casual clothing. Shirts must have sleeves. Closed toe shoes required. No head covers.

Lecture classroom: Scrubs or casual clothing. No head covers.

Internship: Scrubs or dress as dictated by your internship site.

UNIVERSITY & COURSE EXPECTATIONS

It is the responsibility of each OSUIT student to read, abide by and maintain a copy of the syllabus for this course. Syllabi are available on the OSUIT website.

Students understand that excerpts or portions of their work may be utilized for institutional assessment purposes. The purpose of institutional assessment is for verification of student learning and program improvement. Every effort will be made to keep this information confidential.

AMERICANS WITH DISABILITIES ACT (ADA)

According to the Americans with Disabilities Act, each student with a disability is responsible for notifying the University of his/her disability and requesting accommodations. If you think you have a qualified disability and need special accommodations, you should notify the instructor and request verification of eligibility for accommodations from the Office of Academic Accommodations/LASSO Center. Please advise the instructor of your disability as soon as possible, and contact The LASSO Center, located in the Noble Center for Advancing Technology – NCAT, top floor, and 918-293-4855 to ensure timely implementation of appropriate accommodations. Faculty have an obligation to respond when they receive official notice of a disability but are under no obligation to provide retroactive accommodations. To receive services, you must submit appropriate documentation and complete an intake process during which the existence of a qualified disability is verified and reasonable accommodations are identified.

ACADEMIC DISHONESTY

Academic dishonesty or misconduct is neither condoned nor tolerated at OSUIT. Any student found guilty of academic dishonesty or misconduct shall be subject to disciplinary action. Academic dishonesty and/or misconduct includes, but is not limited to, the following actions: (1) Plagiarism: the representation of previously written, published, or creative work as one's own; (2) Unauthorized collaboration on projects; (3) Cheating on examinations; (4) Unauthorized advance access to exams; (5) Fraudulent alteration of academic materials; (6) Knowing cooperation with another person in an academically dishonest undertaking. Students are required to actively protect their work against misuse by others. For details, refer to The OSUIT Student Handbook (Student Rights and Responsibilities Governing Student Behavior) available online at http://www.osuit.edu/academics/forms/student_rights_responsibility.pdf.

ATTENDANCE POLICY FOR FACE-TO-FACE COURSES

A primary component of OSUIT's Mission is "to prepare and sustain a diverse student body as competitive members of a world-class workforce." Regular and consistent attendance not only aids in academic success, dependable attendance is a requirement in today's real-world employment; therefore, regular and consistent attendance is a requirement in all OSUIT courses.

Definitions: Absent: Failing to attend all or a significant portion of a class or lab session.

- A. Students may not be marked as absent if missing class for situations such as, but not limited to
1. participating in a required university activity such as a field trip;
 2. fulfilling a military obligation;
 3. a mandatory court appearance;
 4. death in the immediate family;
 5. extreme illness or accident to oneself or immediate family. Instructors, at their discretion, may require proof of such events.
- B. It is the responsibility of the student to contact and inform the instructor and/or department in advance of such excused absences whenever possible.
- Tardy: Arriving late to class as defined by the individual class instructor. Faculty, at their discretion, may equate three tardies to equal one absence.

Procedures:

Early Intervention

- A. Any student who misses 10% of an individual course (or earlier at faculty discretion) during a regular fifteen-week semester, or the equivalent portion of time in a shorter session, will have their name submitted by that course instructor to the OSUIT Early Alert System for retention intervention.
- B. At the point the Early Alert is issued, the student *must* meet with their assigned faculty advisor or designated faculty/staff member within seven (7) academic calendar days for counseling on how to improve their attendance and academic success.

Excessive Absences

- A. The University reserves the right to administratively withdraw any student from an individual course who misses 20% of that course, whether excused or unexcused, and, in the opinion of the instructor, the student does not have a reasonable opportunity to be successful in the course.
- B. Students should be aware any of the following may impact their financial aid:
 - 1. being administratively withdrawn from a course
 - 2. dropping a course
 - 3. their last date of attendance in a course

Please see OSUIT Policy 2-021 for full details and procedures.

SYLLABUS ATTACHMENT

View the Syllabus Attachment, which contains other important information, by visiting http://osuit.edu/center/student_syllabus_information

COURSE OUTLINE

See attached schedule.

OPT 1204: Upper Extremity Prosthetics
Tues/Thurs 1:00 p.m. – 4:20 p.m.

5/3	Course Guidelines Below the Elbow Limb Anatomy Bones Landmarks Tool Kit/PPE/Machine Safety	Lecture Lecture Lecture
5/8	Upper Limb Anatomy Planes of Motion Muscles of the Forearm and Hand Upper Limb Pathology Amputation Levels Transradial Model Transradial Model Fabrication: Open Lab	Lecture Lecture Lecture/demo Lab
5/10	Transradial Socket Designs Test Socket Fabrication Test Socket Fabrication: Open Lab	Lecture Lecture/demo Lab
5/15	Transradial Anatomy/Pathology Quiz Terminal Devices/Wrist Units Test Socket Fabrication: Open Lab	Quiz Lecture Lab
5/17	Test Socket Due Transradial Socket Lamination Materials Lay-up Transradial Socket Lamination: Open Lab	Project due Lecture/demo Lab
5/22	Transradial Socket Lamination: Open Lab	Lab
5/24	Memorial Day Holiday	
5/29	Terminal Devices/Wrist Units Quiz Transradial Alignment Double-wall Lamination Foaming and Shaping Outer Lamination Transradial Socket Lamination: Open Lab	Quiz Lecture/demo Lecture/demo Lab
5/31	Transradial Socket Lamination Due Transradial Suspension Flexible Hinges Figure 8 Harness Outer Lamination/Harnessing: Open Lab	Project due Lecture Lab

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6/5	Outer Lamination/Harnessing Due Figure 8 Harness Quiz Transradial Cabling Transradial Cabling: Open Lab	Project Due Quiz Lecture/demo Lab
6/7	Self-Suspending Socket Designs Northwestern Meunster Otto Bock Transtibial Cabling: Open Lab	Lecture Lab
6/12	Transradial Socket 1 Due* Harness Due* Humeral Cuff and Cabling *End of class Humeral Cuff and Cabling: Open Lab	Project Due Project Due Lecture/Demo Lab
6/14	Above the Elbow Limb Anatomy Muscles Proximal to Elbow Humeral Cuff and Cabling: Open Lab	Lecture Lab
6/19	Humeral Cuff and Cabling: Open Lab	Lab
6/21	Humeral Cuff and Cabling: Open Lab Transradial Socket 1 Due	Lab Project Due
6/26	Summer Break	
6/28	Summer Break	
7/3	Summer Break	
7/5	Summer Break	
7/10	Mid-Term Exam Review Humeral Cuff and Cabling: Open Lab	Lecture Lab
7/12	Mid-Term Exam Single Pivot Hinges Single Pivot Hinges Fabrication Alignment Joint Spacer Single Pivot Hinges: Open Lab	Exam Lecture Lecture/demo Lab

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7/17	Single Pivot Hinges Fabrication Contouring Outer Lamination Single Pivot Hinges: Open Lab	Lecture/demo Lab Lab
7/19	Single Pivot Hinges: Open Lab	Lab
7/24	Transhumeral Anatomy Review Single Pivot Hinges: Open Lab	Lecture Lab
7/26	Transhumeral Anatomy Quiz Transhumeral Amputation Socket Design Suspension TH Flexible Inner Socket Fabrication Single Pivot Hinges: Open Lab	Quiz Lecture Lecture/Demo Lab
7/31	Single Pivot Hinges Due TH Flexible Inner Socket: Open Lab	Project Due Lab
8/2	TH Flexible Inner Socket: Open Lab	Lab
8/7	TH Flexible Inner Socket Due TH Laminated Socket TH Laminated Socket: Open Lab	Project Due Lecture/Demo Lab
8/9	Assembling the TH Prosthesis TH Laminated Socket: Open Lab	Lecture/Demo /12 Lab
8/14	TH Laminated Socket: Open Lab	Lab
8/16	TH Laminated Socket: Open Lab	Lab
8/21	UE Prosthetics Final Exam Review TH Laminated Prosthesis: Open Lab TH Laminated Prosthesis Due	Lecture Lab Project Due
8/23	UE Prosthetics Final Exam TH Laminated Prosthesis: Open Lab Project Break-down and Cleaning	Exam Lab Lab