

Oklahoma State University Institute of Technology
Face-to-Face Common Syllabus
Fall 2017

OPT 1304 Transtibial Prosthetics

Transtibial Prosthetics covers physical deficits that result from limb loss following transtibial amputation. Different levels of transtibial and partial foot amputation, management, prosthetic materials and components, lab safety and equipment techniques, as well as principles of fabrication, suspension and static alignment are also covered.

Course Purpose: The purpose of Transtibial Prosthetics is to help the learner attain the knowledge and fabrication skills required to successfully fabricate transtibial prosthesis.

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 Format: Face-to-Face

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 p.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

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

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

References: Wilson Jr., Bennett. *A Primer on Limb Prosthetics*.

Salter, Robert. *Textbook of Disorders and Injuries of the Musculoskeletal System*.

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 lower extremity	Anatomy Quiz (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 Fill impressions with plaster	Lab Project (F)
3.2 Modify models in preparation for fabrication activities	Lab Project (F)
4.1 Use all machinery as described in the Machine Lab Safety Manual	Instructor Observation (F)
4.2 Utilize the appropriate personal protective equipment while using tools and hazardous materials	Instructor Observation (F)
11.1 Summarize the characteristic of a PTB transtibial socket	Final Exam (S)
11.2 Summarize the characteristics of a TSB transtibial socket	Final Exam (S)
12.1 Summarize the advantages and disadvantages of transtibial suspension options	Final Exam (S)
14.2 Summarize the characteristics of the major categories of prosthetic feet	Quiz, Final Exam (F)
14.4 Assemble components for a transtibial prosthesis	Lab Project (F)
15.1 Bubble-form plastic over a prosthetic model with minimal wrinkles and artifacts	Lab Project (F)
15.2 Finish test socket with negligible damage to plastic	Lab Project (F)
16.1 Establish correct coronal, sagittal, and transverse plane relationships between components	Lab Project (F)
17.1 Select and apply prosthetic textiles to a lower extremity 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)

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
- Write a research paper (open transtibial 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 transtibial prostheses
- Demonstrate professional behavior in lab situations
- Complete transtibial fabrication projects safely and expediently
- Construct transtibial 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 of transtibial designs
- Understand appropriate bench alignment in relation to available prosthetic feet
- 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 transtibial 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*

60%*Fabrication Projects**

10%.....*Homework and Research (if assigned)*

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

*Grades include adherence to safety procedures and cleaning up after each lab day.

*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.

RECOMMENDED STUDENT COMPETENCIES/SKILLS

Student success will be enhanced by familiarity with hand and power tools, the ability to read measurements in both imperial (foot/inch) and metric units, and working knowledge of electronic communication programs and techniques such as Microsoft Word and file download and attachment processes.

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 are 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. (Fall 2013)

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.

OPT 1304: Transtibial Prosthetics
Tues/Thurs 8:30 a.m. – 11:50 a.m.

1/4	Course Guidelines Machine Check-Out Lower Limb Anatomy Structures Landmarks Amputation levels	Lecture Lecture/Demo Lecture
1/9	Lower Limb Anatomy Transtibial Model Transtibial Model Fabrication	Lecture Lecture/demo Lab
1/11	Lower Limb Pathology Transtibial Model Fabrication	Lecture Lab
1/16	Lower Limb Anatomy/Pathology Quiz Transtibial Socket Designs PTB vs. TSB Transtibial Model Fabrication	Quiz Lecture Lab
1/18	Check Socket Fabrication Check Socket Fabrication	Lecture/demo Lab
1/23	Transtibial Model due Transtibial Biomechanics (Gait) Check Socket Fabrication	Project due Lecture Lab
1/25	Check Socket due Transtibial Two Stage Lamination PVA Bags Capping/Sheet PVA Transtibial Socket Fabrication	Project due Lecture Lab
1/30	Transtibial Two Stage Lamination Materials Lay-up Transtibial Socket Fabrication	Lecture/demo Lab
2/1	Socket Inserts Rationale Types Pathology Transtibial Socket Fabrication	Lecture Lab
2/6	Prosthetic Sockets/Inserts Quiz Research Paper Guidelines Transtibial Socket Fabrication	Quiz Lecture Lab

OPT 1304: Transtibial Prosthetics
Tues/Thurs 8:30 a.m. – 11:50 a.m.

2/8	Transtibial Socket 1st Lamination due Transtibial Alignment Rationale Biomechanics Alignment of Laminated Socket	Project due Lecture Lab
2/13	Mid-term Exam Review Alignment of Laminated Socket	Lecture Lab
2/15	Alignment of Laminated Socket	Lab
2/20	Two Stage Lamination (2 nd Stage) Endoskeletal Exoskeletal Second Stage Lamination	Lecture/demo Lab
2/22	Prosthetic Feet Second Stage Lamination	Lecture Lab
2/27	Mid-term Exam Prosthetic Components Suspension Options	Exam Lecture Lecture
3/1	Dual-wall Lamination due Single Stage Lamination Rationale Methods Materials Single Stage Lamination	Project due Lecture/Demo Lab
3/6	Research Presentation Guidelines Single Stage Lamination	Lecture Lab
3/8	Prosthetic Feet/Suspension Quiz Single Stage Lamination	Quiz Lab
3/13	Exoskeletal Fabrication Pelite Liner Fabrication	Lecture/demo Lecture/demo
3/18	Exoskeletal Fabrication Single Stage Lamination Single Stage Lamination due	Lab Lab Project due (end of class)
3/20	Spring Break	
3/22	Spring Break	

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Tues/Thurs 8:30 a.m. – 11:50 a.m.

3/27	Exoskeletal Fabrication Pelite Liner Fabrication Pelite Liner Fabrication	Lecture/demo Lecture/demo Lab
3/29	Syme's Prosthesis Syme's Prosthesis Pelite Liner Fabrication	Lecture Lab Lab
4/3	Syme's Prosthesis Exoskeletal Fabrication	Lab Lab
4/5	Final Exam Review Syme's Prosthesis Exoskeletal Fabrication	Lecture Lab Lab
4/10	Syme's Prosthesis Exoskeletal Fabrication	Lab Lab
4/12	Syme's Prosthesis Exoskeletal Fabrication	Lab Lab
4/17	Transtibial Prosthetics Final Exam Syme's Prosthesis due Exoskeletal Prosthesis due	Project due (end of class) Lab
4/19	Project break-down and cleaning	Lab

**** Schedule is subject to change at the instructor's discretion ****