

**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 1:00 p.m. – 4:20 p.m.

**Prerequisites:** None

**Instructor Name:** Michael P. Madden

**Instructor Phone:** (918) 293-5320

**Office:** HTED; Lab

**Instructor Email:** [mike.madden@okstate.edu](mailto: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**

**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 characteristics 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)*

<b>OSUIT Grading Scale</b>	
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.

### **SYLLUBUS ATTACHMENT**

View the Syllabus Attachment, which contains other important information, by visiting [http://osuit.edu/center/student\\_syllabus\\_information](http://osuit.edu/center/student_syllabus_information)

## **OPT 1304: Transtibial Prosthetics Course Schedule Tues/Thurs 1:00 p.m. – 4:20 p.m.**

9/7	Course Guidelines	Lecture
	Machine Check-Out	Lecture/Demo
	Lower Limb Anatomy	Lecture
	Structures	
	Landmarks	
	Amputation levels	
9/12	Lower Limb Anatomy	Lecture
	Transtibial Model	Lecture/demo
	Transtibial Model Fabrication	Lab

**OPT 1304: Transtibial Prosthetics**  
**Course Schedule**  
**M/W 8:30 a.m. – 11:50 a.m.**

9/14	Lower Limb Pathology Transtibial Model Fabrication	Lecture Lab
9/19	<b>Lower Limb Anatomy/Pathology Quiz</b> Transtibial Socket Designs PTB vs. TSB Transtibial Model Fabrication	<b>Quiz</b> Lecture Lab
9/21	Check Socket Fabrication Check Socket Fabrication	Lecture/demo Lab
9/26	<b>Transtibial Model due</b> Transtibial Biomechanics (Gait) Check Socket Fabrication	<b>Project due</b> Lecture Lab
9/28	<b>Check Socket due</b> Transtibial Two Stage Lamination PVA Bags Capping/Sheet PVA Transtibial Socket Fabrication	<b>Project due</b> Lecture Lab
10/3	Transtibial Two Stage Lamination Materials Lay-up Transtibial Socket Fabrication	Lecture/demo Lab
10/5	Socket Inserts Rationale Types Pathology Transtibial Socket Fabrication	Lecture Lab
10/10	<b>Prosthetic Sockets/Inserts Quiz</b> Research Paper Guidelines Transtibial Socket Fabrication	<b>Quiz</b> Lecture Lab
10/12	<b>Transtibial Socket 1<sup>st</sup> Lamination due</b> Transtibial Alignment Rationale Biomechanics Alignment of Laminated Socket	<b>Project due</b> Lecture Lab
10/17	Mid-term Exam Review Alignment of Laminated Socket	Lecture Lab
10/19	Alignment of Laminated Socket	Lab

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**M/W 8:30 a.m. – 11:50 a.m.**

10/24	Two Stage Lamination (2 <sup>nd</sup> Stage) Endoskeletal Exoskeletal Second Stage Lamination	Lecture/demo  Lab
10/26	Prosthetic Feet Second Stage Lamination	Lecture Lab
10/31	<b>Mid-term Exam</b> Prosthetic Components Suspension Options Second Stage Lamination	<b>Exam</b> Lecture Lecture Lab
11/2	<b>Dual-wall Lamination due</b> Single Stage Lamination Rationale Methods Materials Single Stage Lamination	<b>Project due</b> Lecture/Demo  Lab
11/7	Research Presentation Guidelines Single Stage Lamination	Lecture Lab
11/9	<b>Prosthetic Feet/Suspension Quiz</b> Single Stage Lamination	<b>Quiz</b> Lab
11/14	Exoskeletal Fabrication Single Stage Lamination <b>Single Stage Lamination due</b>	Lecture/demo Lab <b>Project due (end of class)</b>
11/16	Exoskeletal Fabrication Pelite Liner Fabrication Pelite Liner Fabrication	Lecture/demo Lecture/demo Lab
11/21	Syme's Prosthesis Syme's Prosthesis Pelite Liner Fabrication	Lecture Lab Lab
11/23	<b>Thanksgiving Break</b>	
11/28	Syme's Prosthesis	Lab
11/30	Final Exam Review Syme's Prosthesis	Lecture Lab
12/5	Syme's Prosthesis	Lab

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12/7	Syme's Prosthesis	Lab
12/12	<b>Transtibial Prosthetics Final Exam</b> Syme's Prosthesis <b>Syme's Prosthesis due</b>	Lab <b>Project due (end of class)</b>
12/14	Syme's Prosthesis Project break-down and cleaning	Lab

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