

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

**OPT 2324 Lower Extremity Orthotics**

*Lower Extremity Orthotics covers lab procedures, design, modification, fabrication, adjustment, and repair of lower extremity orthoses. Lab safety and procedures are emphasized. Review of the ankle, knee and hip complex is covered with particular attention placed on anatomy and biomechanics. A brief overview of standing systems and reciprocating gait orthoses are covered as well.*

**Course Purpose:** The purpose of Lower Extremity Orthotics is to help the learner attain the knowledge and fabrication skills required to successfully fabricate both below-the-knee and above-the-knee orthosis.

**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:** Monday/Wednesday 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](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:** 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:** 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:	OPT 2324
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)
1.4 Identify the major components and activities of the gait cycle	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)
7.1 Thermoform plastic over an AFO model with ankle joints	Lab Project (F)
7.2 Fabricate a plantarflexion stop on a thermoplastic articulating AFO	Lab Project (F)
7.3 Trim a solid ankle AFO to correct dimensions	Lab Project (F)
7.4 Sew and rivet a calf strap for a thermoformed AFO	Lab Project (F)
8.1 Create an AFO tracing with correct contours and clearances	Lab Project (F)
8.2 Bend aluminum uprights to match contours on drawing	Lab Project (F)
8.3 Correctly locate and rivet stirrup to shoe	Lab Project (F)
8.4 Correctly locate and rivet calf band to uprights	Lab Project (F)
8.5 Correctly attach and align ankle joints	Lab Project (F)
8.6 Sew and attach a calf strap for a conventional AFO	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:

- Participate in lectures and class discussion
- Understand and implement ALL safety procedures within O/P lab
- Participate in reading and research assignments
- Determine appropriate material selection and componentry selection.
- Complete project assignments
- Demonstrate professional behavior in lab situations.
- Participate in Oral presentations
- Give attention to differing designs, materials and components available in orthotic fabrication.
- Prepare and complete negative mold into positive model.
- Modify positive plaster models as dictated by specific criteria.
- Demonstrate appropriate inventory control of the lab.
- Understand properties of materials and components relating to patient size and activity levels.
  - Identify lower extremity anatomy.
  - Participate in class activities on patient measurement and Orthometry forms.
  - Manufacture, design, modify, adjust, and repair lower extremity orthoses.
  - Participate in discussions regarding professional responsibilities and scopes of practice in the Orthotic industry.

## **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)

<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**

Students' 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.m. on the day it is due. Due dates for all 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. (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](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

**OPT 2324: Lower Extremity Orthotics**  
**M/W 8:30 a.m. – 11:50 a.m.**

1/8	Course Guidelines Machine Check-Out	Lecture Lecture/Demo
1/10	Lower Limb Anatomy Structures Landmarks LE Model Fabrication Duplicating model Pouring plaster	Lecture  Lecture/Demo Lab Lab
1/15	<b>Martin Luther King Holiday</b>	
1/17	Lower Limb Anatomy Muscles Distal to Knee LE Model Modification Build-ups LE Model Fabrication	Lecture  Lecture/Demo  Lab
1/22	Solid Ankle AFOs Materials Trim Lines Varus/valgus control Standard Leaf-spring Vacuum-forming Solid Ankle AFO LE Model Fabrication Solid Ankle AFO Fabrication	Lecture     Lecture/Demo Lab Lab
1/24	Solid Ankle AFOs Finishing plastic Sewing Pads and Straps Riveting the Strap Solid Ankle AFO Fabrication	Lecture/Demo    Lab
1/29	<b>LE Anatomy Quiz</b> Principles of Metal AFO AFO Tracing Layout Correction and Clearances Solid Ankle AFO Fabrication AFO Tracing	<b>Quiz</b> Lecture Lecture/Demo   Lab Lab
1/31	<b>Solid Ankle AFO Due</b> Metal AFO Fabrication Stirrup Selection Stirrup Bending Metal AFO Fabrication/AFO Tracing	<b>Project Due</b> Lecture/Demo   Lab



**OPT 2324: Lower Extremity Orthotics**  
**T/R 1:00 p.m. – 4:20 p.m.**

2/5	Articulating Plastic AFO Alignment of the Ankle Joints Pathologies Joints and Components LE Model Fabrication Articulating AFO Fabrication Metal AFO Fabrication	Lecture Lecture/Demo  Lab Lab Lab
2/7	Metal AFO Fabrication Contouring the Uprights Articulating AFO Fabrication Metal AFO Fabrication	Lecture/Demo  Lab Lab
2/12	<b>AFO Quiz</b> Articulating AFO Fabrication Metal AFO Fabrication	<b>Quiz</b> Lab Lab
2/14	Muscles of the Thigh Articulating AFO Fabrication Metal AFO Fabrication	Lecture Lab Lab
2/19	Biomechanics of the Ankle/Knee Articulating AFO Fabrication	Lecture Lab
2/21	Articulating AFO Fabrication Metal AFO Fabrication	Lab Lab
2/26	Metal AFO Fabrication: Calf Band Contouring and Squaring Attachment to Uprights Metal AFO Fabrication	Lecture/Demo  Lab
2/28	<b>Articulating Plastic AFO Due</b> Metal AFO Fabrication	<b>Project Due</b> Lab
3/5	Midterm Exam Review Metal AFO Fabrication	Lecture Lab
3/7	<b>Midterm Exam</b> Metal AFO Fabrication	<b>Exam</b> Lab
3/12	Metal AFO Fabrication Squaring and Finishing Strap and Calf Band Cover Metal AFO Fabrication	Lab  Lab

**OPT 2324: Lower Extremity Orthotics**  
**T/R 1:00 p.m. – 4:20 p.m.**

3/14	Metal AFO Fabrication Preparing Shoe for Stirrup Attaching Stirrup to Shoe Metal AFO Fabrication	Lecture/Demo   Lab
3/19	<b>Spring Break</b>	
3/21	<b>Spring Break</b>	
3/26	Metal AFO Fabrication	Lab
3/28	KAFO Tracing Layout Correction and Clearances Hybrid KAFO Casting KAFO Tracing Metal AFO Fabrication	Lecture/Demo   Lecture/Demo Lab Lab
4/2	<b>Metal AFO Due</b>	<b>Project Due</b>
4/4	Hybrid KAFO Casting Metal KAFO Fabrication	Lecture/Demo Lab
4/9	Hybrid KAFO Fabrication Metal/Hybrid KAFO Fabrication	Lecture/Demo Lab
4/11	Standing Frames and Parapodiums Metal/Hybrid KAFO Fabrication	Lecture Lab
4/16	<b>Final Exam Review</b> Metal/Plastic Hybrid KAFO Metal/Hybrid KAFO Fabrication	Lecture Lecture/Demo Lab
4/18	<b>Final Exam</b> HKAFO and RGO Metal/Hybrid KAFO Fabrication <b>Metal/Hybrid KAFO Due</b> Lab Cleanup and Project Breakdown	Lecture Lab <b>Project Due</b> Lab

\*Schedule is subject to change at instructor discretion\*

