OPT 105 Upper Extremity Orthotics

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Office Hours: M-R 8:00 – 9:00 AM

Course Description:
The course is designed to provide students with the knowledge and skills necessary to fabricate plastic and metal upper extremity orthoses. Upper extremity skeletal structures and biomechanical principles of upper extremity orthoses are also integrated throughout the course. Interpretation and application of upper extremity orthome try will be covered. Variations of upper extremity orthoses and fracture orthoses will also be covered. Fitting of off the shelf upper extremity orthoses is also integrated into the curriculum.

IAI number: N/A

Credit and Contact Hours
* Credit Hours 3
* Lecture/Demonstration 1
* Lab/Studio/Clinical 4

Prerequisites:
OPT 100

Books, Supplies, and Supplementary Materials
- Required Textbooks/Reading list
  No text required. Materials provided by program director
- Supplementary texts/materials
  All supplementary materials developed and provided by program director
- Other resources utilized:
  Curriculum from Northwestern University’s Prosthetic Orthotic Center

Methods of Instruction:

Lecture
Laboratory
Clinical Rotations

Student Learning Outcomes

1. Gather the necessary tools, instruments and materials to fabricate various upper extremity orthoses
2. Select proper materials for a given upper extremity orthosis intervention
3. Fabricate various types of upper extremity orthoses with skill and accuracy
4. Identify anatomical landmarks necessary to fabricate upper extremity orthoses
5. Modify upper extremity orthosis casts for proper contours, alignment and biomechanical effect
6. Describe and discuss various trim line options for upper extremity orthoses
7. Take an impression for a basic upper extremity orthosis
8. Take measurements and delineation for an upper extremity orthosis
9. Fit and adjust basic upper extremity orthoses
General Education Student Learning Outcomes
Students must be able to:
  Math: Calculate percentages, perform metric to English conversions, apply linear measurements with respect to human anatomy, perform basic geometric right angle lay out.
  English and language skills:
  Communicate verbal and written concepts in a clinical and laboratory environment.

Graded Assignments and Policies
Graded Assignments:
Laboratory projects are separated into technical and clinical sections. Each project is graded according to category. Quizzes and exams are given throughout the course. Attendance is taken and counted as part of the grade.

The following schedule is an estimate of the work that will be included in the final point total; should items be eliminated the same percentages will stand for the adjusted point total. The student’s grade is based on the individuals completed and corrected work.

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Number</th>
<th>Points</th>
<th>Total</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Projects</td>
<td>7</td>
<td>10</td>
<td>70</td>
<td>A</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5</td>
<td>20</td>
<td>100</td>
<td>B</td>
</tr>
<tr>
<td>Final Written</td>
<td>1</td>
<td>50</td>
<td>50</td>
<td>C</td>
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<tr>
<td>Final Project</td>
<td>1</td>
<td>50</td>
<td>50</td>
<td>D</td>
</tr>
<tr>
<td>Class Participation</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>F</td>
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Grading Policy

Major Tests and Quizzes:
Student performance will be evaluated throughout the semester through the use of section quizzes; project evaluation check lists; midterm and final exams.

Classroom Policies and Procedures
A. General Information

Students must become familiar with the lab safety rules and abide by those rules. Students who are unable to follow the safety rules will not be allowed to continue in the program.

Complete all assignments and projects in a timely manner.

Wear proper clothing for surface anatomy sessions.

Homework assignments are required to be completed prior to the next class session. Homework assignments consist primarily of iCampus video presentations that are essential to understanding and preparing for laboratory projects for the next class meeting.

Open laboratory times are available each semester. The instructor will provide students with the open lab times at the beginning of each semester. Every effort should be made to complete projects during the allotted class time.

Since orthotics and prosthetics is a medical field, a clean and neat appearance is essential. Sleeveless shirts, short pants, or clothing of questionable taste, etc. are not acceptable in the O/P lab.

B. Attendance Policy:

Attendance is essential for the student to develop the sequentially presented skills. If absence is unavoidable, notify the instructor prior to a scheduled class. Because many of the projects build from
what was done in previous class work, it is advisable to attend each class. Attendance is taken and class participation is counted as part of the grade.

Attend all classes. Do not make appointments during scheduled class times (doctors, dentist, personal, business, etc.).

An excused absence may be allowed in the case of personal illness, family emergency, transportation difficulties or as previously arranged with the instructor.

C. Make-up Policy

All work assigned will be due by the assigned date; late work may be accepted at a penalty to the student. The penalty is one-half (1/2) credit for the late assignment. The grade will be on a total point system with points assigned to each activity assigned to the class.

D. Extra-credit Policy

Students have the opportunity to gain extra credit through special projects, assistance in lab set up and other fabrication projects as determined by the department head. All extra credit must be scheduled and approved by the department head. Students may apply the agreed upon credit to projects, quizzes or exams.

E. Final Exam Information

Final exams are given during final exam week. Exams consist of a written exam and a laboratory practical.

F. Academic Honor Code

The objective of the academic honor code is to sustain a learning-centered environment in which all students are expected to demonstrate integrity, honor, and responsibility, and recognize the importance of being accountable for one's academic behavior. Students who are found in violation of the academic honor code will be required to meet with the program director to determine the severity of the penalty. This may include dismissal from the program, remediation in the form of specific assignments or other measures that are determined by the department head.

G. College Statement about grades of “F” and withdrawal from class.

- Students may withdraw from a course by processing an add/drop form during regular office hours through the Registration and Records Office at Main Campus or Romeoville Campus, or by phone at 815-744-2200. Please note the withdrawal dates listed on your bill or student schedule. Every course has its own withdrawal date. Failure to withdraw properly may result in a failing grade of “F” in the course.
- At any time prior to the deadline dates established, an instructor may withdraw a student from class because of poor attendance, poor academic performance or inappropriate academic behavior, such as, but not limited to, cheating or plagiarism.

H. Intellectual Property

Students own and hold the copyright to the original work they produce in class. It is a widely accepted practice to use student work as part of the college’s internal self-evaluation, assessment procedures, or other efforts to improve teaching and learning and in promoting programs and recruiting new students. If you do not wish your work to be used in this manner, please inform the instructor.

I. Student Code of Conduct

Each student is responsible for reading and adhering to the Student Code of Conduct as stated in the college catalog.

J. Sexual Harassment

Joliet Junior College seeks to foster a community environment in which all members respect and trust each other. In a community in which persons respect and trust each other, there is no place for sexual
harassment. JJC has a strong policy prohibiting the sexual harassment of one member of the college community by another. See Catalog or Student Handbook.

K. Student Support [http://jjc.edu/services-for-students/pages/default.aspx](http://jjc.edu/services-for-students/pages/default.aspx)

   a. Disability Services: [http://jjc.edu/services-for-students/disability-services/Pages/default.aspx](http://jjc.edu/services-for-students/disability-services/Pages/default.aspx).

   b. Tutoring: [http://jjc.edu/services-for-students](http://jjc.edu/services-for-students)

   c. Counseling and Advising: [http://jjc.edu/services-for-students/counseling-advising](http://jjc.edu/services-for-students/counseling-advising)

   d. Academic Resources: [http://jjc.edu/services-for-students/academic-resources](http://jjc.edu/services-for-students/academic-resources)

   e. Support Programs: [http://jjc.edu/services-for-students/support-programs-services](http://jjc.edu/services-for-students/support-programs-services)

   f. Technology Support: [http://jjc.edu/services-for-students/Pages/technology-support.aspx](http://jjc.edu/services-for-students/Pages/technology-support.aspx)

L. Safety

Students with an impaired ability to concentrate may jeopardize safety in this classroom for themselves, their classmates and their instructor. If your ability to concentrate is impaired you should discuss this matter with your instructor prior to operating equipment or performing a laboratory procedure. Students are responsible for reporting to their instructor any condition that would impair the ability to concentrate. Failure to notify your instructor of this issue may be a violation of the Student Code of Conduct.

For safety purposes, students are required to wear closed shoes at all times.

Safety glasses must be worn in all designated areas.

### Topical Outline

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<tr>
<th>Week</th>
<th>OPT 105 Upper Extremity Orthotics</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Upper Extremity function and biomechanics</td>
<td>Review of functional anatomy of the upper extremity. Terminology specific to upper extremity orthotic management. Review anatomy of the upper extremity. Objectives: 1. Identify anatomical landmarks of the upper extremity 2. Explain conceptual difference between upper extremity and lower extremity structure 3. Define the relationship of proximal stability and grasp and release</td>
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<tr>
<td>Week 2</td>
<td>Upper Extremity Measurements and Orthometry Upper Limb Orthotic Components</td>
<td>Lecture/Demonstration of the upper extremity. Interpretation of upper extremity orthometry forms. Preparation for fabrication. Laboratory project; measurements and orthometry Objectives: 1. Identify various upper limb orthoses</td>
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</tbody>
</table>
2. Explain the purpose and function of upper limb orthotic components
3. Identify and relate anatomical structure to an upper extremity orthometry form
4. Locate anatomical landmarks for the purpose of gathering measurement data

| Week 3 | HO Fabrication  
| Thumb Adduction Stop  
| 2nd MP Abduction Spring Assist | Lecture/Demonstration of HO fabrication. Fabrication of spring assist, thumb adduction stop. Laboratory project.  
**Objectives:**  
1. Identify the components of a hand orthosis  
2. Describe the purpose of a hand orthosis  
3. Fabricate a basic metal hand orthosis |

| Week 4 | Fitting and Modification of Metal HO  
| Project Critique | Lecture/Demonstration, fitting of hand orthosis, evaluation of fit, modification of orthosis. Critique.  
**Objectives:**  
1. Identify correct fitting parameters of a basic hand orthosis  
2. Adjust the fit of a hand orthosis to maximize biomechanical objectives |

| Week 5 | HO Thermoplastic Rationale and Impression | Lecture/Demonstration impression, measurements for polymer HO. Laboratory project.  
**Objectives:**  
1. Take a plaster of paris impression for a basic hand orthosis  
2. Position the hand for function and use |

| Week 6 | HO; Fill Impression and Modify | Lecture-demonstration; Preparation of impression, fill and modify. Laboratory project.  
**Objectives:**  
1. Prepare a hand orthosis impression for filling  
2. List techniques for finger reinforcement for filling a hand orthosis |

| Week 7 | Fabrication Techniques, HO | Lecture/Demonstration; fabrication of thermoplastic HO. Laboratory fabrication project.  
**Objectives:**  
1. Identify component sections for a one piece polymer hand orthosis  
2. Apply pattern to cast for fabrication of a polymer hand orthosis  
3. Fabricate a polymer hand orthosis |

| Week 8 | Fitting and Modification of Polymer HO  
| Project Critique | Lecture/Demonstration, fitting of hand orthosis, evaluation of fit, modification of orthosis. Laboratory Project Critique  
**Objectives:**  
1. Identify fitting parameters for a hand orthosis  
2. Modify a hand orthosis to meet the biomechanical objectives of a hand orthosis |

| Week 9 | Metal WHO MP Extension Stop  
| IP Extension Assist  
| Measurements and Orthometry | Lecture/Demonstration; MP extension stop, IP extension assist. Laboratory project.  
**Objectives:**  
1. Measure for a metal WHO  
2. Locate anatomical landmarks for measurement of a metal WHO |

| Week 10 | Fabrication Techniques, WHO  
<p>| MP Extension Stop | Lecture/Laboratory, fabrication of WHO metal system, fabrication of MP extension stop, IP extension assist. |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Objectives</th>
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<tbody>
<tr>
<td>11</td>
<td>Fitting, Modification and Critique of Metal WHO, MP Extension Stop, IP Extension Assist</td>
<td>Lecture/Demonstration, fitting and modifications of WHO, MP extension stop and IP extension assist. Laboratory Project Critique. Objectives: 1. Identify fitting parameters for a metal WHO 2. Modify a metal WHO to meet biomechanical objectives</td>
</tr>
<tr>
<td>12</td>
<td>Measurements, Impression WHO Polymer</td>
<td>Measurements and impression WHO polymer, lecture/lab. Objectives: 1. Perform impression technique for a polymer WHO 2. Place the hand in the functional position for meeting biomechanical objectives</td>
</tr>
<tr>
<td>13</td>
<td>WHO Polymer Fabrication</td>
<td>Lecture/ Laboratory demonstration, fabrication, modifications trim lines. Laboratory project. Objectives: 1. Fabricate a polymer WHO 2. Identify trim line variations of polymer WHO’s</td>
</tr>
<tr>
<td>14</td>
<td>WHO Polymer Fitting and Critique</td>
<td>Lecture/Laboratory fitting and modification of basic WHO custom polymer system. Objectives: 1. Identify proper fit and function of a custom WHO 2. Modify a WHO to meet biomechanical objectives</td>
</tr>
<tr>
<td>15</td>
<td>HO, EO and SEWHO systems. Off the Shelf Upper Extremity Systems Modifications, Fitting, and Critique</td>
<td>Lecture/Demonstration review of pre-fabricated systems. Modifications and critique. Laboratory Project. Objectives: 1. Identify various off the shelf WHO and SEWHO systems 2. Fit and modify off the shelf upper extremity systems</td>
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<tr>
<td>16</td>
<td>Wrist Driven and Powered Upper Extremity Orthotic Systems</td>
<td>Lecture/Demonstration of body powered and external powered orthotic systems. Course Review and project finalization. Objectives: 1. Identify various powered WHO systems 2. Explain the function of a wrist driven WHO</td>
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<tr>
<td>Final Exam Week</td>
<td>Final Exam</td>
<td>Final Exam. Problem solving (Lab Practical)</td>
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**Effective Date:** 1-16-2012