Course Descriptions: Orthotics and Prosthetics Masters Curriculum

SEMESTER 1

HAP030L - Human Anatomy and Physiology **3 Credit Hours**

This course will present core knowledge of the gross anatomy and physiology. Students will demonstrate an anatomical and functional understanding of the human body. The integrated gross anatomy laboratory exercises will address related basic science issues.

INP030 - Introduction to Pathology **3 Credit Hours**

This course will present the basic concepts of disease processes in the human body. The knowledge of disease processes will be helpful in the differential diagnosis process and the development of a treatment plan that include realistic goals and is consistent with prognosis of the disease. The course will address General Pathology, which deals with the basic principles and characteristics of disease processes that may involve any tissue or organ of the body and underlie all diseases, and Systemic Pathology, which deals with the pathophysiologic processes that affect specific tissues and organ systems of the body. A clinical pathological approach i.e., ability to understand, interpret and correlate patients' clinical signs and symptoms with the underlying pathophysiologic process will be emphasized.

ACN030 - Applied Clinical Neuroanatomy **3 Credit Hours**

This course will present the human motor control systems and various neurophysiological theories and principles which are applied in the rehabilitation of patients with neurological dysfunction. Emphasis will be placed on progressive and non-progressive neurological disorders throughout the adult life span. Students will review and practice evaluation, treatment, and documentation principles for the disorders presented. Case studies will be utilized to emphasize problem solving and clinical decision-making in patient care.

CGA030L - Clinical Gait Analysis **3 Credit Hours**

This course will present the fundamental principles of static and dynamic movement in able-bodied persons and persons with lower limb pathology. This course will introduce the mechanical and biomechanical principles integrated with anatomical and neuromuscular knowledge to provide an understanding of static and dynamic human movement. The biomechanics of human ambulation will be broken down into kinematic and kinetic data during all phases of the gait cycle using instrumented analysis equipment as well as clinical observational analysis. The students will be introduced to pathologic gait and begin to correlate gait deviations because of clinical pathologies to the pathomechanics of gait analysis. Clinical simulations in this course introduce the students to patient encounters and require a display of professionalism, knowledge of the roles & responsibilities and the Scope of Practice of a certified prosthetist/orthotist (CPO). The experience gained from this course will be used as foundational knowledge of understanding pathological gait for the remaining clinical didactic courses in the program and.

ILS010L - Introduction to Laboratory Skills and Materials in Prosthetics and Orthotics **1 Credit Hour**

This course will present an introduction to equipment and tools used in the fabrication of prostheses and orthoses. Proper safety techniques and operating procedures in the laboratory environment are stressed. Prosthetic and orthotic material characteristics are introduced.

CET010L - Clinical Evaluation Tools **1 Credit Hour**

This course will present a focus on utilizing medical evidence and patients' exam to support clinical practical decisions. This course is clinically based on instruction in selection of the prescription criteria. The course will help students gather and document appropriate clinical data required for good practical decisions. The laboratory portion will focus on patient assessment skills and documentation requiring students to display of professionalism, knowledge of the roles & responsibilities and the Scope of Practice of a certified prosthetist/orthotist (CPO).

SEMESTER 2

OMU030L - Orthotic Management of the Upper Limb **3 Credit Hours**
Prerequisite: Successful completion of semester 1

This course will present a comprehensive prosthetic patient care and practice management for short- and long-term orthotic patient management of the upper extremity in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.
3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in orthotic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and custom fit orthotic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of a custom molded WHO.
- Design principles of upper extremity prosthetic systems specific to transradial and transhumeral levels including figure of 8 & 9 harness systems, anatomical suspension variants and single and dual control cable systems.

- Justification of prosthetic design and treatment recommendations using evidence based practice including pathology, biomechanics, socket design, coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

OMS030L - Orthotic Management of the Spine 3 Credit Hours
Prerequisite: Successful completion of semester 1

This course will present a comprehensive orthotic patient care and practice management for short- and long-term patient management of the spine and cranium in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.
3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in orthotic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and custom fit orthotic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of a custom molded TLSO.
- Application of technology including CAD/CAM. CAD is utilized in the modification/rectification of a positive model. CAM is utilized in the fabrication of the intended device.
- Justification of orthotic design and treatment recommendations using evidence based practice including pathology, biomechanics, coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

OML040L - Orthotic Management of the Lower Limb 1 4 Credit Hours
Prerequisite: Successful completion of semester 1

This course will present a comprehensive lower limb orthotic patient care and practice management for short- and long-term patient management distal to the knee in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.
3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in orthotic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and custom fit orthotic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of custom molded orthotic devices including FO's, UCBL, articulated and non-articulated AFO's.
- Justification of orthotic design and treatment recommendations using evidence based practice including pathology, biomechanics, coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

PML140L - Prosthetic Management of the Lower Limb 1 4 Credit Hours
Prerequisite: Successful completion of semester 1

This course will present a comprehensive prosthetic patient care and practice management for short- and long-term patient management distal to the knee in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.
3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in prosthetic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and

custom fit prosthetic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of custom molded prosthetic sockets including PTB and TSB socket designs.
- Justification of prosthetic design and treatment recommendations using evidence based practice including pathology, biomechanics, socket design coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

SEMESTER 3

OML240L - Orthotic Management of the Lower Limb 2 4 Credit Hours
Prerequisite: Successful completion of semester 2

This course will present a comprehensive lower limb orthotic patient care and practice management for short- and long-term patient management of the lower extremity in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.
3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in orthotic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and custom fit orthotic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of custom molded orthotic devices such as a GRAFO and KAFO.
- Justification of orthotic design and treatment recommendations using evidence based practice including pathology, biomechanics, coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

PML240L - Prosthetic Management of the Lower Limb 2 4 Credit Hours
Prerequisite: Successful completion of semester 2

This course will present a comprehensive prosthetic patient care and practice management for short- and long-term patient management of the lower extremity in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.
3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in prosthetic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and custom fit prosthetic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of custom molded prosthetic sockets including a Quadrilateral socket and an Ischial Containment socket.
- Application of technology including CAD/CAM. CAD is utilized in the modification/rectification of a positive model. CAM is utilized in the fabrication of the intended device.
- Justification of prosthetic design and treatment recommendations using evidence based practice including pathology, biomechanics, socket design coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

PMU030L - Prosthetic Management of the Upper Limb 3 Credit Hours
Prerequisite: Successful completion of semester 2

This course will present a comprehensive prosthetic patient care and practice management for short- and long-term patient management of upper extremity amputations in the pediatric, adult and geriatric populations.

Didactic instruction includes:

1. Patient (pt.) assessment/evaluation.
2. Formulation of a treatment plan.

3. Implementation of a treatment plan.
4. Follow up on a treatment plan.
5. Practice management including documentation, coding and interdisciplinary communication.
6. Promotion of competency and enhancement of orthotics practices and healthcare ethics.

Laboratory instruction includes:

- Pt. assessment/evaluation technique including impression taking.
- Application of biomechanical principles in prosthetic design.
- Device fitting principles & troubleshooting for custom molded, custom fabricated and custom fit prosthetic devices.
- Creation of a positive model of patient anatomy.
- Positive model modification and rectification.
- Fabrication of custom molded transradial and transhumeral prosthetic sockets.
- Design principles of upper extremity prosthetic systems specific to transradial and transhumeral levels including figure of 8 & 9 harness systems, anatomical suspension variants and single and dual control cable systems.
- Justification of prosthetic design and treatment recommendations using evidence based practice including pathology, biomechanics, socket design, coding, material science and international standards of care.
- Documentation of all pt. interactions, clinical decision making and applicable interdisciplinary communication.
- Relevant case studies will be discussed to facilitate clinical problem-solving skills.

CPS040L - Contemporary Practice and Synthesis **4 Credit Hours**
Prerequisite: Successful completion of semester 2

This course will present the student with several graded realistic clinical simulations to provide the student with feedback with respect to their ability to complete a patient evaluation process competently; their ability to integrate and apply foundational knowledge and patient information to direct potential orthotic and/or prosthetic management; their ability to apply the necessary skills and procedures, including fabrication, to provide orthotic and/or prosthetic care; their ability to develop and implement an effective follow-up plan to assure optimal fit and function of the orthosis or prosthesis and monitor the outcome of the treatment plan; their ability to identify and observe policies and procedures regarding human resource management, physical environment management, financial management and organizational management as well as articulating the importance of personal and professional development.

CLR010 - Clinical Research **3 Credit Hour**
Prerequisite: Successful completion of semester 2

This course will present the student with an in-depth understanding of the research process. The student will develop techniques used in scientific research to critically

evaluate scientific papers with regard to the measurements and methods used. The course emphasizes a conceptual understanding of how different research designs can be instituted to answer a variety of questions relevant to the field of Orthotics and Prosthetics. Emphasis is placed on building a foundation for future professional practice and stresses the importance of research for informed decisions and evidence-based practice as well as the importance of ethical research conduct. Students will search, read, and analyze literature that validates current practice. Students will also learn basic steps related to the design of research projects.

SEMESTER 4

CLR020 - Clinical Rotation **2 Credit Hours**
Prerequisite: Successful completion of semester 3

This course will present real world clinical experience to augment formal classes. This course provides clinical rotation hours off-site, in which students observe, assist, and practice patient care and device fabrication in an environment that prepares them for an orthotic or prosthetic residency. Students are placed at a clinical agency to practice skills under close supervision of an American Board Certified (ABC) prosthetist/orthotist. Students are required to document patient interactions and case analysis of their clinical experiences, and to present case studies to an audience of peers.

MAP030 - Master's Project **1 Credit Hours**
Prerequisite: Successful completion of semester 3

This course will present individual work culminating in a professional practice-oriented report suitable for the requirements of the Professional Track of the Master of Science program in Orthotics and Prosthetics.