

PROSTHETICS AND ORTHOTICS (P&O)

Prerequisites: *Admission to the Prosthetics and Orthotics program, concurrent enrollment and completion of all prosthetics and orthotics course and Program Director's consent.*

HSC 5000. Interprofessional Education for the Health Sciences (1cr.). This course introduces students to the principles of interprofessional education and collaboration. The course is organized around the four competencies of values and ethics; roles and responsibilities; interprofessional communication; and teams and teamwork.

HSC-5001: Advanced Gross Human Anatomy w/Lab (6 crs.)

An advanced, detailed regional study of the structure of the human body with emphasis on the skeletal, muscular, cardiovascular, peripheral nervous, and respiratory systems. An introduction to functional anatomy and selected pathologies provide a basis for the future understanding of the kinetics of motion and of dysfunction. This course includes cadaver dissection, lectures, case studies, and computer-based learning.

HSC-5002: Functional Human Anatomy w/Lab (2 crs.)

This course introduces students to relevant medical, anatomical and basic biomechanical terminology. It will emphasize anatomical structures and function as they relate to the human body. Students will begin to use handling, palpation and problem solving skills to apply basic movement principles related to bone, muscle, joint and other structures.

HSC-5003: Patient Care Concepts I [Lab] (1 cr.)

This course provides the student with a foundation for interacting with consumers of rehabilitation services and with other healthcare professionals. This laboratory course introduces the student to basic concepts in patient care including: communication and building rapport, basic patient handling skills, clinical observation and assessment, aseptic technique, vital signs, positioning and draping, transition and transfer skills, common devices used in patient care, and working as a member of a healthcare team.

HSC-5006: Introduction to Research and Evidence-based Practice (2 crs.)

This course addresses the role of research in professional clinical practice including foundations of research, introduction to the research process, research sources utilization and dissemination, and principles and models of evidence-based practice.

HSC-5007: Research in the Health Professions (2 cr.)

This course addresses the conduct of research, applied research designs, human subjects protection, and planning, implementing and evaluating health professions research.

HSC-5010: Patient Care Concepts II w/Lab (2 crs.)

This course lays the foundation for patient care in rehabilitation settings (i.e. physical therapy, prosthetics & orthotics). Students will address examination and evaluation techniques and rationale related to anthropometric characteristics, physiologic responses, emergencies related to treatment, joint integrity, range of motion, goniometry, manual muscle testing, motor function and performance, posture/gait and gait deviations. It will also include the patient/client management model, documentation of history, objective measurements, treatment and goals.

HSC-5011: Biomechanics (2 crs.)

This course is an introduction to kinesiology by study of biomechanics, including statics, dynamics, strength of materials, and related aspects of human muscle mechanics and physiology. Emphasis will be placed on the importance of mechanical principles in relation to analysis of human body at rest and in motion with both normal and selected pathological examples. This course will prepare the physical therapy/prosthetic & orthotic students regarding application of biomechanics in a general physical therapy/prosthetic & orthotic practice with a clinical emphasis on musculoskeletal concerns. Biomechanics application to gait, exercise equipment and ergonomics will be utilized to prepare the students for clinical practice.

HSC-5013: Introduction to the Integumentary System (1 crs.)

This course will review skin anatomy and the wound healing process in relation to the etiology of common integumentary diagnoses. Identification of types wounds, the wound assessment process and wound relief measures will be presented. Wound dressing categories will be introduced and discussed in relationship to the wound assessment and patient function.

HSC-5014: Psychosocial Aspects of Disability (3 crs.)

An examination of the study of individual reactions to various disabling conditions, the adjustment process, cultural norms and expectations, and responses to the rehabilitation process. The psychological impact of disability will be examined by analyzing the individual's adjustment to disability and related issues pertaining to self-concept, self-worth, role fulfillment, and quality of life. Social aspects of disability will be studied by analyzing societal attitudes toward people with disabilities; discrimination and segregation issues; impact of disability on vocational and other social role functioning; and images of people with disabilities portrayed in the media and other cultural forms of expression. Particular attention will be placed on increasing awareness about environmental barriers that confront people with disabilities in our society. Treatment interventions, designed to minimize the impact of disability, will be emphasized throughout the course.

HSC-5099: Capstone (3 crs.)

The student will conduct a systematic investigation of a clinical question related to practice, in consultation with a capstone advisor. This work may include more than one student with program approval. The completed capstone should present the nature of the problem or subject investigated, its significance to the profession or larger field of study, a discussion of the relevant literature, a clearly defined method for exploring the question of interest, and specific conclusions or recommendations. A formal paper and presentation are required.

MPO 5110: Introduction to Prosthetics and Orthotics (2 crs.)

This course provides an overview of the fundamental concepts that orthotics and prosthetics are founded on. The purpose of the course is to provide the student with a base knowledge that the subsequent clinical courses can build upon. The course covers: professional identity, terminology, history, scope of practice, materials, fabrication processes, component identification, a survey of common pathologies, basic clinical problem solving, orthosis and prosthesis classification and basic biomechanical principles. In addition, students will be introduced to basic research formulation through reading, processing, and discussion of relevant journal articles to the field of prosthetics and orthotics.

MPO 5190: Clinical Observation I (1)

This course examines the practical application of medicine, surgery and rehabilitation under the supervision of a variety of health care professionals. Students will be exposed to a multitude of diseases and conditions in hospitals, clinics and/or private practice settings. Although students will have the opportunity to rotate through few orthotic and prosthetic facilities, the emphasis of this first clinical rotation course is on the basics of prosthetics, orthotics, and medicine.

MPO-5210: Lower Limb Orthotics I w/Lab (3 crs.)

The topics covered in this course will include all elements of orthotic intervention of the lower extremity that are concerned with the lower leg and foot distal (i.e., below) to the knee. The major areas addressed in this course are: pedorthics, foot orthoses (FO), ankle foot orthoses (AFO), neuroprosthetics, examination of the foot and ankle, pediatric and adult orthotic management, technical fabrication methods, computer-aided-design/computer-aided-manufacture in orthotics (CAD/CAM), orthotic management of fractures, fit and function assessment. Students use each other as pseudo-patient models to fabricate and fit an array of custom orthoses.

MPO-5220: Lower-Limb Prosthetics I w/Lab (3 crs.)

This course examines the principles and practices of prosthetics as they relate to amputations distal to the knee. The course covers a diversity of topics that include: patient assessment, post-operative management, negative impression and measurement procedures, gait analysis, prosthetic alignment, fit and function assessments, fabrication procedures, computer-aided-design/computer-aided-manufacture in prosthetics (CAD/CAM), component and material selection, and principles of gait training. Professional patient/subject models are used to demonstrate the clinical fit and function of a prosthesis.

MPO-5230: Neuroscience for P&O (2 crs.)

This course will cover the areas of neuroscience specific to prosthetic and orthotic intervention. Specific topics include; neural anatomy (including the brain, spinal cord, peripheral nerves), physiology of neurons and neuronal firing, neural development, neuroplasticity (motor learning) and motor control of extremities. The motor control portion will focus on normal and pathological gait and upper limb movement with an emphasis on deficits routinely requiring P&O intervention.

MPO-5290: Clinical Rotation II (1 cr.)

This course examines the practical application of medicine, surgery and rehabilitation under the supervision of a variety of health care professionals. Students will be exposed to a multitude of diseases and conditions in hospitals, clinics, and/or private practice settings. Although students will have the opportunity to rotate through few orthotic prosthetic facilities the emphasis of the second clinical rotation course is on lower limb prosthetics (principles and practices of prosthetics as they relate to amputations distal to the knee) & lower limb orthotics (elements of orthotic intervention of the lower extremity that are concerned with the lower leg and foot distal (i.e., below) to the knee).

MPO-5310: Spinal Orthotics w/Lab (3 crs.)

The spinal orthotics course provides an overview of orthotic management of the trunk, head and neck. The topics covered in this course are: cervical orthoses (CO), thoracic lumbo-sacral orthoses (TLSO), lumbo-sacral orthoses (LSO), sacral orthoses (SO), scoliosis management, post-operative management of the spine, cranial helmets, thermal injuries of the face and extremities. Students use each other as pseudo-patient models to fabricate and fit an array of custom orthoses. However, professional patient models will be used for some elements of the course.

MPO-5320: Cranial Seminar (1 cr.)

This course examines the principles and practices of orthotics as they relate to deformational plagiocephaly and other head shape deformities. The emphasis of this course will be on the terminology, cranial anatomy, evaluation process, and techniques associated with cranial orthoses.

MPO-5340: Pathology in P&O (3 crs.)

This course will provide an introduction to general pathology. A systematic study of specific disease processes, their clinical manifestations and medical/surgical management will be explored. Emphasis will be placed on those diseases that produce neuromuscular and/or musculoskeletal dysfunction.

MPO-5390: Clinical Rotation III (1 cr.)

This course examines the practical application of medicine, surgery and rehabilitation under the supervision of a variety of health care professionals. Students will be exposed to a multitude of diseases and conditions in hospitals, clinics and private practice settings. Although students will have the opportunity to rotate through few orthotic & prosthetic facilities, the emphasis of the third clinical rotation course is on spinal orthotics, and reinforcement of clinical rotation II in lower limb prosthetics (principles and practices of prosthetics as they relate to amputations distal to the knee) & lower limb orthotics (elements of orthotic intervention of the lower extremity that are concerned with the lower leg and foot distal (i.e., below) to the knee). In addition clinical rotations may include specialty clinics in the areas of: multiple sclerosis, muscular dystrophy, scoliosis, spina bifida, cerebral palsy, stroke rehabilitation, sports medicine, and diabetic foot.

MPO 5399: Professional Seminar in P&O (1 cr.)

This course will expose students to new theories and treatment techniques that are utilized by prosthetic and orthotic practitioners. Advanced training in a technique may also be covered in this seminar. Students may enroll in and receive credit for this class up to four times.

MPO-6410: Lower Limb Orthotics II w/Lab (3 crs.)

This course is a continuation of Lower Limb I that focuses on orthotic management of disorders that afflict the proximal (i.e., nearer to the center of the body) limb regions that include the knee, hip, pelvis and trunk. Topic areas covered in this course are: knee ankle foot orthoses (KAFO's), knee orthoses (KO), hip knee ankle foot orthoses (HKAFO's), reciprocating gait orthoses (RGO's), externally powered orthoses, sport orthoses and pediatric and adult orthotic management. Students use each other as pseudo-patient models to fabricate and fit an array of custom orthoses.

MPO 6420: Applied Clinical Research (1 cr.)

This course is designed to introduce or reintroduce students to the basic and advanced concepts, techniques, and principles of critical inquiry using applied clinical research. The focus will be on understanding quantitative aspects of clinical research literature. Topics to be investigated include measurement theory and the scientific method; the research process, experimental design, hypothesis construction and testing, measurement scales, sampling, indices of validity and reliability, statistical analyses, and critical evaluation of occupational language of statistics and what those statistics mean.

MPO-6430: Lower Limb Prosthetics II w/Lab (3 crs.)

This course examines the principles and practices of prosthetics as they relate to amputations proximal to the knee and include: transfemoral amputations, knee disarticulations, and hip disarticulations. The course covers the following topics: patient assessment, post-operative management, negative impression and measurement procedures, gait analysis, prosthetic alignment, fit and function assessments, fabrication procedures, computer-aided-design/computer-aided-manufacture in prosthetics (CAD/CAM), component and material selection and principles of gait training. Professional patient/subject models are used to demonstrate the clinical fit and function of prostheses.

MPO-6440: Advanced Prosthetics and Orthotics Technologies (3 crs.)

This course exposes the student to the latest in advanced technologies seen in modern clinical practice. Specific topics include; Computer aided design and manufacture of prosthetic/orthotic devices, microprocessor (MP) controlled P&O systems (MP knee/feet, MP knee orthoses, exo-skeletons, direct neural control of prostheses, etc.), advanced prosthetic suspension systems, and osteo-integrated prostheses. Students will also discuss how these technologies are changing clinical care and the ethical use of these technologies.

MPO-6490: Clinical Rotation IV (1 cr.)

This course examines the practical application of medicine, surgery and rehabilitation under the supervision of a variety of health care professionals. Students will be exposed to a multitude of diseases and conditions in hospitals, clinics, and/or private practice settings. Although students will have the opportunity to rotate through few orthotic & prosthetic facilities, the emphasis of the fourth clinical rotation course is building upon specific course work focusing on spinal orthotics, lower limb prosthetics (principles and practices of prosthetics as they relate to amputations proximal & distal to the knee) & lower limb orthotics (elements of orthotic intervention of the lower extremity that are concerned with the upper & lower leg and foot. In addition, clinical rotations may include specialty clinics in the areas of: multiple sclerosis, muscular dystrophy, scoliosis, spina bifida, cerebral palsy, stroke rehabilitation, sports medicine, diabetic foot, general orthopaedics, cardiology, endocrinology, neurology, orthopaedic radiology, rheumatology, pediatric orthopaedics, pediatric neurology, and physiatry.

MSPO-6510: Upper Extremity Orthotics w/Lab (3 crs.)

The upper extremity orthotic course is tied closely to the respective prosthetics course during the same term. The parallels in considering functional tasks in management of the upper extremity and the design implications in prescription formulation are uniquely linked. Orthotic management of pathologies that affect the shoulder, elbow, wrist, and hand are presented in this course. As with the other orthotic courses, students use each other as pseudo-patient models to fabricate and fit custom orthoses for the wrist, hand, elbow, and shoulder; as well as exposure to a multitude of prefabricated custom-fitted devices.

MPO-6520: Upper Extremity Prosthetics w/Lab (3 crs.)

This course examines the principles and practices of prosthetics as they relate to amputations of the upper extremity and include: transhumeral, transradial, partial hand amputations, shoulder disarticulations, congenital anomalies, and myoelectric prostheses. The course covers the following topics: patient assessment, post-operative management, negative impression and measurement procedures, gait analysis, prosthetic alignment, fit and function assessments, fabrication procedures, computer-aided-design/computer-aided-manufacture in prosthetics (CAD/CAM), component and material selection, and principles of gait training. Professional patient/subject models are used to demonstrate the clinical fit and function of prostheses.

MPO-6530: Practice Management and Administration in P&O (2 crs.)

This course examines prosthetic and orthotic practice management in the current health care environment. Topics to be discussed are practice management, clinical reasoning, integration of evidence-based practice into clinical relevant decision-making, and synthesis of relevant information. There will be an emphasis on documentation and coding skills. Various other topics will be addressed such as professional scope of practice, professional identity, reimbursement, licensure/certification, health care economics, codes of ethics, and marketing.

MPO-6590: Clinical Rotation V (1 cr.)

Students will be allowed to pick a site of their choice that matches their interest in orthotics and prosthetics. This course examines the practical application of medicine, surgery and rehabilitation under the supervision of a variety of health care professionals. Students will be exposed to a multitude of diseases and conditions in hospitals, clinics, and/or private practice settings. Although students will have the opportunity to rotate through few orthotic & prosthetic facilities, the emphasis of the fifth clinical rotation course is on adult and pediatric orthotics & prosthetics (specifically upper extremity). Students should also be exposed to spinal orthotics, lower limb prosthetics (principles and practices of prosthetics as they relate to amputations proximal & distal to the knee) & lower limb orthotics (elements of orthotic intervention of the lower extremity that are concerned with the upper & lower leg and foot. In addition, clinical rotations may include specialty clinics in the areas of: multiple sclerosis, muscular dystrophy, scoliosis, spina bifida, cerebral palsy, stroke rehabilitation, sports medicine, diabetic foot, general orthopaedics, cardiology, endocrinology, neurology, orthopaedic radiology, rheumatology, pediatric orthopaedics, pediatric neurology, and physiatry.