Orthotics & Prosthetics Program
Course Descriptions for Class of 2021, Matriculating Fall, 2019

Didactic Phase Curriculum

Fall 1 Semester

OPANA 62101 Anatomical Sciences for O&P

This course is designed to provide the student an extensive background in the fundamentals of human anatomy through lecture, small group laboratory, and independent study formats. Structures of the central nervous system (spinal cord), upper and lower extremities, and additional elements of the musculo-skeletal system are described and illustrated in lecture followed by laboratory experiential learning that emphasizes the location, identification, function, and relationships of pertinent structures using cadavers, prosections, radiographic images, and static models. The course is intended to provide an anatomical basis for understanding the physical examination and structural changes associated with illness and injury of each major organ and body system explored.

OPCC 61101 Cultural Competency for O&P

Cultural Competency introduces students to issues surrounding cultural awareness and sensitivity pertaining to the diversity and uniqueness of populations to be encountered as health care practitioners through lectures, discussions, small group activities, and participation in community events. Specifically, the course explores personal bias, communication styles, belief systems, alternative health care practices, family roles, and the relationship of these issues to perceptions of culture and socioeconomic status.

HPHBC 62201 Health Behavioral Counseling

This course will explore the theory and practice of counseling for health behavior change with a focus on application of Motivational Interviewing skills to health-risk behaviors. The stages of behavior change will be introduced using the frameworks of the Transtheoretical Model, health/belief theories, and self-determination theory. Elements of the therapeutic alliance and the principles of harm reduction will be introduced along with aligning with the patient through strategic health behavior change counseling. Modeling through role play will be used to develop and refine the student's ability to identify behavioral risks, assess readiness for change, and use effective communication skills to elicit the patient's commitment to change. Observations of self-help and patient support group sessions will be used to further socialize students to the degree to which individuals are committed to change. Students will be prepared to incorporate the identification of risk and assessment of readiness to change into written reports of workups of patients in conjunction with Physical Examination courses. These experiences should help the student develop an intimate understanding of the process of change and thereby increase empathy for patients attempting to adhere to challenging treatment regiments and improve their own health behaviors.

OPBMA 62101 Biomechanics I

The study of normal human movement, performance and function through the application of biomechanical and motor control principles with emphasis on joints, moments, and ground reaction forces. Strategies include methods to study normal and pathological movements via gait analysis; the action and effects of external and internal forces on the musculoskeletal system; the body structure/function changes due to over-, under-, and non-use of body segments; and the influence of orthotic/prosthetic devices on skin integrity, muscular tissue, bone growth, posture, balance and mobility.

Biomechanics I introduces the study and practice of evaluating and quantifying normal human movement as it relates to activities of daily living. Approaches to the study of biomechanics include gross movements of the human body, musculoskeletal, and neuromuscular considerations for human movement, dynamic force distribution, materials behavior, and lever arms. Skills pertaining to goniometric observations and concepts of linear and angular kinematic and kinetic calculations are introduced. Biomechanics Fundamentals is part one of a two-part course spanning two semesters. Biomechanics Fundamentals begins with an introduction to biomechanics as a discipline and explores application to human movements. Functional anatomy of the spinal column, upper limb, and lower limb are covered with considerations given to orthotic and prosthetic clinical application. Students will be exposed to a variety of techniques for motion analysis including but not limited to: visual analysis, video analysis, and introduction to Zeno Walkway by Protokinetics.

OPMSS 62101 Materials Science and Selection for O&P

Material Science and Selection for O&P explores the materials used in the construction of orthotic and prosthetic devices, both custom and pre-fabricated, and strategies of selecting from among them for specific clinical uses. Classifications and properties of metals, plastics, foams, leather, and other materials are introduced and linked directly to specific application in devices and components in O&P. Choices for material properties are compared and contrasted. Numerous clinical and technical applications are exemplified throughout the course.

OPFOP 63101 Foundations of O&P

The Foundations of Orthotics and Prosthetics class is designed to provide an introduction to major themes covered throughout the balance of the program. Lab safety, materials selection, technical activities, tool identification and selection, professionalism, Clinical communication, and safety of self and others. The course highlights topics essential to the learning and practice of O&P are emphasized. Foundations focuses on content that is used across core curriculum and is heavily biased to developing entry level competencies and best practices for future coursework in OP program. Concepts learned and skills developed in foundations provide the framework for success in the didactic year, clinical experiences, and professional practice.

OPPEA 62101 Physical Examination I

Physical Examination I introduces the study and scope of physical patient examinations. Physical exam diagnostic procedures are reviewed and practiced. Characterization of diseases of the human body commonly leading to orthotic and/or prosthetic care is also reviewed.

OPLOA 67101 Lower Limb Orthotic Management I

Lower Limb Orthotics 1covers a comprehensive range of orthotic management of all aspects of the lower limb below the knee. Examples of devices include orthoses for the ankle, foot, and various permutations thereof. Bony and muscle anatomy, surface anatomy, muscle physiology, kinesiology, weight-bearing strategies, and biometrics relative to the foot and ankle and gait are covered in depth. Pathologies and conditions commonly treated with footwear and orthoses of the feet and/or ankles are explored, historical orthotic approaches are reviewed, and modern treatment philosophies are covered in depth. Students learn about, observe, and then perform essential aspects of foot and ankle orthotic care including patient assessment and communication, device design recommendation, measurement and casting, component and material selection, positive model optimization, device fabrication, device application and fitting principles, gait deviation detection and classification, and patient device training including shoe wear, device maintenance, and patient follow up.

OPLPA 68101 Lower Limb Prosthetic Management I

Lower Limb Prosthetic Management 1(LLP I) covers a comprehensive range of prosthetic management of amputation levels of the lower limb through the tibia and points distal. Bony and muscular anatomy, surface anatomy, kinesiology, and biometrics relative to the lower limb are covered in depth with special attention on amputees. Conditions resulting in lower limb amputation are explored, historical prosthetic approaches to prosthetic practices are reviewed, and modern prosthetic devices, components, and approaches are covered in depth. Students learn about, observe, and then perform essential aspects of prosthetic care for amputees with an intact knee including patient assessment and communication, K-Level evaluation and designation, device design recommendation, measurement and casting, component and material selection, positive model optimization, device fabrication, prosthetic alignment and transfer, device application and fitting principles, gait deviation detection, patient device training, gait considerations, device maintenance, volume management, patient follow up, and more. LLP I also covers prosthetic foot evaluation and selection and prosthetic management specific to partial foot and Syme's amputees, children, soldiers, and bilateral amputees.

OPULO 64101 Upper Limb Orthotic Management

Upper Limb Orthotic Management covers a comprehensive range of orthotic management of all aspects of the upper limb. Devices include orthoses for the shoulder, elbow, forearm, wrist, hand, thumb, and/or fingers. Bony and muscular anatomy, surface anatomy, muscle physiology, kinesiology, and biometrics related to the provision of upper limb orthotic services are covered in depth. Students learn, observe, and then perform essential aspects of upper limb orthotic care including patient assessment and communication, device design recommendation, measurement and casting, component and material selection, positive model optimization, device fabrication, device application and fitting principles, patient device training, patient education, device maintenance, and patient follow up.

OPPAT 62101 Pathophysiology for O&P

Pathophysiology for O&P explores a range of diseases, trauma, movement disorders, congenital anomalies, and other conditions often indicated for orthotic and/or prosthetic intervention, as well as associated surgical, therapeutic, and pharmacological interventions. The goal for this course is to introduce the underlying causes, risk factors, natural history, and categorical biomechanical indications for these conditions that often warrant O&P intervention. Pathophysiology for O&P is scheduled and pulsed intentionally to coincide or precede analogous content in O&P core courses where these conditions are contextualized within the provision of comprehensive O&P clinical care.

OPCPA 62101 Clinical Practice Management I

This course is designed to introduce students to concepts that are second- and third-order removed from direct provision prosthetics and orthotics services for patients. Clinical documentation is covered in great detail, as are Letters of Medical Necessity (LMN's), with examples for source materials for both types of documentation being drawn from concurrent core O&P course projects. While each core O&P course covers coding concepts relative to that practice area, CPM I covers the historical derivation of L-Codes, which Federal governmental agencies perpetuate them and how, and how they are maintained, updated, and/or augmented over time. Finally, Clinical Outcome Measures are also introduced to complement direct provision of clinical services and to provide content for the other types of documentation provided. These concepts are built upon and otherwise deepened with CPM II in the subsequent Spring 1 semester.

OPPED 64101 Pedorthic Management

Pedorthic Management covers orthotic management of the foot and ankle. Devices covered will be those distal to the malleoli. Examples of devices include therapeutic shoes, accommodative foot orthoses, functional foot orthoses, and subtalar control foot orthoses. The course provides an overview of custom shoe wear, as well as shoe modifications. Bony, muscle, and neurological anatomy will be covered, along with pathology of the foot and ankle. Although historical treatment options will be reviewed, the focus of the course will be modern clinical applications. Foot and lower limb pathologies, kinesiology, gait analysis, and orthotic treatment will be explored. Students will learn about, observe, and the perform essential aspects of pedorthic management to include patient evaluation and initial assessment, impression taking, device design, positive model modification, material selection, device fitting, device modification, and patient outcome assessment.

Spring 1 Semester

OPHRM 62201 Health Research Methods

This course introduces the participant to research methods used in clinical and community-based research, evidence-based practices used to evaluate potential treatment alternatives, and critical evaluation of current published literature. The course uses lectures, practice exercises and online activities to involve the learner in research proposal development

and the interpretation of research performed by others. Assignments assist in learner application and reinforcement of information presented during lecture and the text and articulate knowledge gained promoting constructive criticism and critical reflection.

OPETH 62201 Medical Ethics

Medical Ethics focuses the development of ethical principles and standards in the practice of medicine and other types of healthcare delivery. It has emphasis in case-based scenarios and discussion groups to effectively teach and model ethical principles. This course has three components: (1) lectures, (2) small group sessions, and (3) clinical ethics rounds, and it combines students from multiple disciplines to ensure the fullest breadth and depth of clinical care is covered.

OPPEB 62202 Physical Examination II

Physical Examination II begins with instruction of detailed Range of Motion and Manual Muscle Testing (ROM/MMT) of the complete lower limb and assessment for such. It continues with physical exam concepts applied to orthotic and/or prosthetic care and distributed with the corresponding "core" orthotic / prosthetic courses.

OPBMB 62202 Biomechanics II

Biomechanics continues the study and practice of evaluating and quantifying human movement through simple and complex means begun in Biomechanics I. Established, "low-tech," clinically-relevant measures and clinical outcomes instruments that individual practitioners may perform on a regular basis with minimum initial investment begin this course. Both quantitative and qualitative varieties are explored, including surveys. Students also gain experience evaluating novel instruments not yet validated for use in O&P. Biomechanical principles and clinical O&P concepts are applied to gait / movement studies of moderate- to high-tech approaches, up to and including fully-equipped motion-analysis laboratory. Application of fundamental biomechanical principles to clinical practice is accomplished through presentation of clinical scenarios and corresponding biomechanical rationales for orthotic and/or prosthetic intervention.

OPLOB 64202 Lower Limb Orthotic Management II

Lower Limb Orthotic Management covers a comprehensive range of orthotic management of all aspects of the lower limb involving the knee joint and points proximal. Examples of devices covered include orthoses for the hip and knee. Also, this course integrates principles of bracing the lower limb below the knee as indicated. Bony and muscle anatomy, surface anatomy, muscle physiology, kinesiology, weight-bearing strategies, and biometrics relative to the knee and hip and gait are covered in depth, and reviewed as indicated for the distal portions of the leg. Pathologies and conditions commonly treated with orthoses of the hip and knee are explored, historical orthotic approaches are reviewed, and modern treatment philosophies are covered in depth. Students learn about, observe, and then perform essential aspects of lower limb orthotic care including patient assessment and communication, device design recommendation, measurement and casting, component and material selection, positive model optimization, device fabrication, device application and fitting principles, gait deviation

detection and diagnosis, patient device training including shoe wear, device maintenance, and patient follow up.

OPLPB 68202 Lower Limb Prosthetic Management II

The Lower Limb Prosthetic Management II course comprehensively covers the full scope of practice for the prosthetic management of individuals with unilateral and bilateral amputations at or proximal to the knee joint. Additionally, the course addresses the management of patients presenting with hip disarticulations and hemi-pelvectomy amputations. The course covers standard and progressive surgical techniques, pre and post-operative prosthetic management and patient-centered multidisciplinary rehabilitation strategies and considerations for lower limb amputees at or proximal to the knee joint. Comprehensive patient evaluations will be performed and practiced; including thorough medical history, psycho-social and physical assessments as well as observational and measured gait analyses. The course requires accountable patient care including detailed documentation, patient education, outcomes measurement, and goal setting. This process culminates in the creation of prosthetic recommendations, in depth justifications of medical necessity, cross disciplinary treatment plans, and follow up care strategies.

The course delves deeply into foundational interface design principles and mechanics as well as discussing progressive interface adaptations for individual patient presentations with amputation at or proximal to the knee joint. Patient measurements for computer aided designs, plaster casting techniques and mold rectifications are performed. Material selection, prosthetic fabrication, component selection and assembly are performed for assessed patients in replicated clinical settings. The foundations of alignment progressions (bench, static, and dynamic), gait deviation analysis and biomechanics are addressed and performed. Thorough coverage and practice of the management of gait deviations through alignment and modifications of interface mechanics are performed throughout the course.

OPSCO 66201 Spinal & Cranial Orthotic Management

Spinal & Cranial Orthotic Management covers a comprehensive range of orthotic management of the head and all spinal levels. Examples of devices include orthoses for the cervical, thoracic, lumbar, and sacral levels, alone and in combinations, cranial molding helmets, and face masks. Bony and muscle anatomy, surface anatomy, muscle physiology, kinesiology, and biometrics relative to the spine and head are covered in depth. Pathologies and conditions commonly treated with spinal orthoses are explored, historical orthotic approaches are reviewed, and modern treatment philosophies are covered in depth. Students learn about, observe, and then perform essential aspects of spinal and cranial orthotic care including patient assessment and communication, device design recommendation, measurement and casting, component and material selection, positive model optimization, device fabrication, device application and fitting principles, patient device training, device maintenance, and patient follow up. Importance of proper patient compliance is highlighted.

OPULP 68201 Upper Limb Prosthetic Management

Upper Limb Prosthetic Management covers a comprehensive range of prosthetic management of all amputation levels of the upper limb. Bony and muscle anatomy, surface anatomy, surgical amputation techniques, muscle physiology, kinesiology, and biometrics relative to the upper limb are covered in depth. Pathologies and conditions resulting in upper limb amputation are explored, historical prosthetic devices and approaches are reviewed, and modern prosthetic philosophies and components are covered in depth. Students learn about, observe, and then perform essential aspects of upper limb prosthetic care including patient assessment and communication, device design recommendation, terminal device categorization and selection, measurement and casting, component and material selection, positive model N2 optimization, device fabrication, prosthetic alignment and transfer, device application and fitting principles, patient device training, device maintenance, and patient follow up.

Upper Limb Prosthetic Management is divided into two units. The first focuses on prostheses for amputation levels below the elbow, including transradial, wrist-disarticulation, partial hand, and finger levels. The second unit covers prostheses for amputation levels at and above the elbow, including elbow disarticulation, transhumeral, shoulder disarticulation, and scapula-thoracic levels.

OPTTP 63201 Transition to Practice

This course is designed to provide directed, pre-clinical training to students during the didactic year in order to ensure proper achievement of baseline clinical competencies prior to entering the clinical phase of their training. The course is a practical assessment course which includes a series of sequenced, graded clinical interactions designed to develop clinical skills related to: patient interaction and bed side manner, proper physical assessment, interviewing skills, formulation of a treatment plan, proper follow-up, ethical care, and adherence to sound social and business practices. Although graded assessments occur throughout the coursework, this course culminates in an Objective Skill Clinical Examination, or OSCE. The OSCE is a high-stakes exam that assess each of the basic competencies through a series of simulated clinical experiences. OSCE exams are video-recorded through simulation laboratories allowing students the opportunity to view their own interactions and learn from the experiences.

OPPMB 62201 Clinical Practice Management II

This course conveys and applies modern administrative and documentation principles related to the provision of comprehensive prosthetic and orthotic care. It introduces students to professional issues related to contemporary clinical practice and exposes them to proper terminology for use in the medical and healthcare field. Students demonstrate proper techniques and develop competence in coding, justification, and in the development of the clinical chart. Practice and business management topics and resources are also addressed in this course as well as an introduction and framework for addressing ethical concerns that arise as part of clinical care and business practice in the orthotics and prosthetics profession.

Clinical Phase Curriculum

Fall 2 Semester

OPORA 62101 O&P Research I

O&P Research I (OPR I) continues the efforts from Health Research Methods for O&P on developing and executing the research project. Students are expected to work with their research advisor(s) to independently organize research planning, data collection, data analysis, and manuscript preparations. The class is assembled at the mid-point of the semester for progress checks and group discussions about research topics and projects. Critiques by fellow students and instructors / mentors are performed resulting in direct feedback for each project. Students gather again at the end of the semester to submit the required deliverables of the project and discuss project progress with advisors and current and adjacent class cohorts.

OPCRA 78101 Clinical Rotation I

Clinical Rotation I is the first four-month clinical rotation in the completion of the dual 18-month OP residency. Residents will work with clinical preceptors and the clinical coordinator to ensure development of skills, direct and indirect supervision as deemed appropriate, completion of the NCOPE residency competencies, and any patient exposure required to round out the residency experience. Residents will be required to submit case logs representing their experience at the clinical site and keep in contact with the clinical coordinator. Residents will be assessed according to NCOPE evaluation form submitted by the clinical preceptors. This rotation will emphasize the development of technical competency.

OPCRB 78102 Clinical Rotation II

Clinical Rotation II is the second four-month clinical rotation in the completion of the dual 18-month OP residency. Residents will work with clinical preceptors and the clinical coordinator to ensure development of skills, direct and indirect supervision as deemed appropriate, completion of the NCOPE residency competencies, and any patient exposure required to round out the residency experience. Residents will be required to submit case logs representing their experience at the clinical site and keep in contact with the clinical coordinator. Residents will be assessed according to NCOPE evaluation form submitted by the clinical preceptors.

OPCSA 71101 Clinical Seminar I

Clinical Seminar I is a 1-credit hour, distance-learning course designed to run concurrently with Clinical Rotation I. This seminar will focus on reviewing foundational principles and introducing advanced clinical practice of lower limb prosthetics. The Clinical Seminars series meets bi-weekly via ZOOM Meeting and/or other web-based, synchronous platforms. In addition to exploring student perspectives on transitioning to residency phase from the classroom, and addressing any concerns voiced by students, faculty-moderated presentations and discussions are led regarding exposure to and acquisition of technical skills within field-based experiences. Guest speakers may present from anywhere online access is

granted, and current events and/or routine Program matters are also reviewed with the students.

OPCSB 71102 Clinical Seminar II

Clinical Seminar II is a 1-credit hour, distance-learning course designed to run concurrently with Clinical Rotation II. This seminar will focus on reviewing foundational principles and introducing advanced clinical practice of upper limb prosthetics and spinal orthotics. The Clinical Seminars series meets bi-weekly via ZOOM Meeting and/or other web-based, synchronous platforms. In addition to exploring student perspectives on transitioning to residency phase from the classroom, and addressing any concerns voiced by students, faculty-moderated presentations and discussions are led regarding exposure to and acquisition of technical skills within field-based experiences. Guest speakers may present from anywhere online access is granted, and current events and/or routine Program matters are also reviewed with the students.

Spring 2 Semester

OPORB 62202 O&P Research II

O&P Research II continues efforts from OPR I on the individual research projects. Midway through, students present progress on their projects and preliminary results to classmates and mentors. Critiques and suggestions are offered on statistical analyses and results sections by students and faculty. Students individually gather remaining data, compute results, and construct remaining sections with mentors. Students gather one more time at the end of the semester to submit the required elements of the project and for class presentation of project progress to current and adjacent class cohorts.

OPCRC 78203 Clinical Rotation III

Clinical Rotation III is the third, 4-month clinical rotation in the completion of the dual, 18-month OP residency. Residents will work with clinical preceptors and the clinical coordinator to ensure development of skills, direct and indirect supervision as deemed appropriate, completion of the NCOPE residency competencies, and any patient exposure required to round out the residency experience. Residents will be required to submit case logs representing their experience at the clinical site and keep in contact with the clinical coordinator. Residents will be assessed according to NCOPE evaluation form submitted by the clinical preceptors.

OPCSC 71203 Clinical Seminar III

Clinical Seminar III is a 1-credit hour, distance-learning course designed to run concurrently with Clinical Rotation III. This seminar will focus on reviewing foundational principles and introducing advanced clinical practice of lower limb orthotics. The Clinical Seminars series meets bi-weekly via ZOOM Meeting and/or other web-based, synchronous platforms. In addition to exploring student perspectives on transitioning to residency phase from the classroom, and addressing any concerns voiced by students, faculty-moderated presentations and discussions are led regarding exposure to and acquisition of technical skills within field-based experiences. Guest speakers may present from anywhere online access is

granted, and current events and/or routine Program matters are also reviewed with the students.

Fall 3 Semester

OPORC 62103 O&P Research III

O&P Research III contains the last milestones of the research project, including creation, polishing, and presenting posters and written manuscripts. This class then meets periodically when students present their work to each other and faculty for critique. Upon approval by their Research Advisor, students prepare posters of their projects to display at the annual Health Professions Research Day in November attended by numerous members of multiple health care professions from around the region. Final master's papers are due by the end of the semester.

OPCRD 76104 Clinical Rotation IV

Clinical Rotation IV is the fourth clinical rotation in the completion of the dual 18-month OP residency. Residents will work with clinical preceptors and the clinical coordinator to ensure development of skills, direct and indirect supervision as deemed appropriate, completion of the NCOPE residency competencies, and any patient exposure required to round out the residency experience. Residents will be required to submit case logs representing their experience at the clinical site and keep in contact with the clinical coordinator. Residents will be assessed according to NCOPE evaluation form submitted by the clinical preceptors.

OPCRE 76105 Clinical Rotation V

Clinical Rotation V is the final clinical rotation in the completion of the dual 18-month OP residency. Residents will work with clinical preceptors and the clinical coordinator to ensure development of skills, direct and indirect supervision as deemed appropriate, completion of the NCOPE residency competencies, and any patient exposure required to round out the residency experience. Residents will be required to submit case logs representing their experience at the clinical site and keep in contact with the clinical coordinator. Residents will be assessed according to NCOPE evaluation form submitted by the clinical preceptors.

OPCSD 71104 Clinical Seminar IV

Clinical Seminar IV is a 1-credit hour, distance-learning course designed to run concurrently with Clinical Rotation IV. This seminar will focus on preparation for navigating a career in orthotics and prosthetics with an appreciation for leadership and lifelong learning. The Clinical Seminars series meets bi-weekly via ZOOM Meeting and/or other web-based, synchronous platforms. In addition to exploring student perspectives on transitioning to residency phase from the classroom, and addressing any concerns voiced by students, faculty-moderated presentations and discussions are led regarding exposure to and acquisition of technical skills within field-based experiences. Guest speakers may present from anywhere online access is granted, and current events and/or routine Program matters are also reviewed with the students.

OPCSE 71105 Clinical Seminar V

Clinical Seminar V is a 1-credit hour, distance-learning course designed to run concurrently with Clinical Rotation V. This seminar will focus on comprehensive orthotics and prosthetics assessment in preparation for the board exams. The Clinical Seminars series meets bi-weekly via ZOOM Meeting and/or other web-based, synchronous platforms. In addition to exploring student perspectives on transitioning to residency phase from the classroom, and addressing any concerns voiced by students, faculty-moderated presentations and discussions are led regarding exposure to and acquisition of technical skills within field-based experiences. Guest speakers may present from anywhere online access is granted, and current events and/or routine Program matters are also reviewed with the students.