



PROSTHETICS-ORTHOTICS PROGRAM

■ DEGREE OFFERED

Bachelor of Science

■ PROGRAM DIRECTOR

Susan L. Kapp, M.Ed., C.P.O.

FACULTY AND ACADEMIC INTERESTS

Robert W. Bucholz, Professor

M.D., Yale University School of Medicine, 1973

Phala A. Helm, Professor

M.D., UT Southwestern Medical School, 1966

John A. Herring, Professor

M.D., Baylor College of Medicine, 1967

Frank A.D. Gottschalk, Professor

M.D., University of Witwatersrand, South Africa, 1970

Susan L. Kapp, Associate Professor

B.S., Texas A&M University, 1979; C.P.O., Northwestern University, 1980, 1990; M.Ed.,

University of Texas at Austin, 2005

Computer-aided design; computer-aided manufacture; new materials application.

Marybeth Ezaki, Assistant Professor

M.D., Yale University School of Medicine, 1977
Pediatric surgery of the hand and the neurologically impaired upper extremity.

Miguel N. Mojica, Assistant Professor

B.S., C.P.O., UT Southwestern Medical Center, 1987
Orthotic management of the spine and upper extremity.

William A. Carlton, Instructor

C.O., Shelby State Community College, 1981;
B.S., UT Southwestern Medical Center, 1983

Robert C. Daniels, Instructor

M.S., DePaul University, 1975; C.P., Northwestern University, 1979

John F. French, Instructor

M.S., Western Illinois University, 1975; C.O., University of Minnesota, 1985

Mark W. Ashford, Clinical Instructor

B.S., C.P., UT Southwestern Medical Center, 1984

John G. Craig, Clinical Instructor

C.P.O., Northwestern University, 1974

Donald R. Cummings, Clinical Instructor

B.S., C.P., UT Southwestern Medical Center, 1984

James Donahue, Clinical Instructor

B.S., C.P., UT Southwestern Medical Center, 1987

Kevin Felton, Clinical Instructor

B.S., C.O., University of Washington, 1986

John R. Ferguson, Clinical Instructor

B.A., California State University, 1985; C.P., University of California, 1986; C.O., Northwestern University School of Medicine, 1991

Tim Goldberg, Clinical Instructor

B.A., University of Montana, 1985; C.P., University of California, Los Angeles, 1989

Cynthia R. Hooper, Clinical Instructor

B.S., C.P.O., UT Southwestern Medical Center, 1994

Donald E. Katz, Clinical Instructor

B.S., C.O., UT Southwestern Medical Center, 1985

Greg Lain, Clinical Instructor

B.S., Texas A&M University, 1977; B.S., C.P.O., UT Southwestern Medical Center, 1990

Chris Lake, Clinical Instructor

B.S., C.P.O., UT Southwestern Medical Center, 1995

John MacGregor, Clinical Instructor

C.P., University of Minnesota, 1982

Bruce P. McClellan, Clinical Instructor

C.P., Northwestern University, 1975; C.O., Cerritos College, 1977; B.S., California State University, 1980

Patrick McGahey, Clinical Instructor

B.S., C.P.O., UT Southwestern Medical Center, 1989

Catherine Mize, Clinical Instructor

B.S., Texas A&M University, 1987; B.S., C.P.O., UT Southwestern Medical Center, 1992

Fabian E. Pollo, Clinical Instructor

B.S., M.E., Ph.D., Texas A&M University, 1987, 1989, 1992

Steve Prock, Clinical Instructor

B.S., C.P.O., University of Washington, 1979

Alan T. Sheppard, Clinical Instructor

B.S., C.P.O., UT Southwestern Medical Center, 1996

Nancy Stinson, Clinical Instructor

B.S., University of California, Los Angeles, 1977; C.P.O., Northwestern University, 1981

Gary Strobel, Clinical Instructor

A.A., Shelby State Community College, 1985

James D. Thelen, Clinical Instructor

C.P., Northwestern University, 1967

Kirsten Tulchin, Clinical Instructor

B.S., Trinity College, 1998; M.S., Marquette University, 2001

Anna Marie Vasquez, Clinical Instructor

B.A., Arkansas State University, 1975; C.P.O., Northwestern University, 1995

Louis Zermeno, Clinical Instructor

B.S., C.O., UT Southwestern Medical Center, 1989

OBJECTIVES

The objectives of the Prosthetics-Orthotics Program are to offer a solid knowledge base in related sciences and to teach the professional and technical skills necessary to meet the needs of patients requiring either replacement of a partially or totally absent limb or fitting of a brace to a disabled spine or limb.

Graduates of the program may function as active members of the health-care team, collaborating with other health-care professionals in rehabilitating people with chronic disabling illnesses, injuries or birth defects.

REQUIREMENTS FOR ADMISSION

The Admissions Committee of the Prosthetics-Orthotics Program determines the admissibility of an applicant into the program in accordance with the quality of his or her credentials. An

■ PROSTHETICS-ORTHOTICS PROGRAM PREREQUISITE COURSES

COMPONENT AREAS	COMMON COURSE NUMBERS	CREDIT HOURS
Communication		
English Composition**	ENGL 1301, 1302, 1311, 1312, 2311, 2314, 2315 or equivalent	6
Speech/Communication	SPCH 1311, 1315, 1318, 1321;	3
Mathematics		
College Algebra**	MATH 1314 or higher level course	3
Statistics**	MATH 1342 or 2342	3
Natural Sciences		
General biology with laboratory**	BIOL 1406, 1407, 1413 or equivalent	4
General chemistry with laboratory**	CHEM 1405, 1406, 1407, 1408 or equivalent	4
Physics with laboratory**	PHYS 1401, 1402 or equivalent	4
Human Anatomy and Physiology with laboratory**	BIOL 2401 and 2402, or equivalent (Requirement may be filled with 8 hours of A&P or 4 hours of Anatomy and 4 hours of Physiology.)	8
Humanities and Visual/Performing Arts		
Visual and Performing Arts*	Courses with prefixes: ARTS, DANC, MUAP, MUEN, MUSI, DRAM or equivalent	3
Other Humanities*	Courses including literature, philosophy, religion, modern or classical languages or literature, and cultural studies	3
Social and Behavioral Sciences		
U.S. History (may include 3 hours of Texas history)*	HIST 1301 and 1302 or 1301 and 2301	6
Political Science (must include study of Texas Constitution)*	GOVT 2301 and 2302, or 2301 and 2305, or 2301 and 2306, or 2305 and 2306	6
General Psychology	PSYC 2301 or equivalent	3
Developmental Psychology	PSYC 2314 or equivalent	3
Other courses		
Electives	May not include physical education or military science courses	1
Total Credit Hours		60

*If an applicant has completed a specified core curriculum at a Texas public institution of higher education, this course is not required for admission to the Prosthetics-Orthotics Program.

** These courses must be completed with a grade of C or better.

Texas Common Course numbers are provided for guidance. Information is available online at www.tccns.org. Click on "The Academic Course Guide Manual." Applicants should contact academic advisors at their college or university to determine course equivalencies prevailing on their home campus. Applicants are encouraged to contact the UT Southwestern Admission Office or the academic program about other courses that may satisfy core curriculum requirements.

interview is required. In addition to the general admission requirements specified in the Student Information section of this catalog, applicants to the Bachelor of Science in Prosthetics-Orthotics degree program must satisfy the following requirements.

- 1) Minimum of 60 semester hours of college credit, not including physical education or military sciences courses;
- 2) Minimum cumulative grade-point average of 2.5 on a 4.0 scale;
- 3) Minimum GPA of 2.5 on a scale of 4.0 for all basic science courses (biology, chemistry, physics) and minimum cumulative GPA of 2.5 on a scale of 4.0 for the last 60 semester hours of all undergraduate course work;
- 4) Prosthetics-Orthotics Program required courses, as specified in the chart on the previous page.

■ TEXAS CORE CURRICULUM POLICY

The state of Texas requires students to complete a core curriculum in order to receive a bachelor's degree from a public college or university. Using guidelines provided by the state, each institution designates its own core curriculum. The UT Southwestern Allied Health Sciences School Core Curriculum consists of 42 semester credit hours in specified component areas. Bachelor's degree applicants who have completed the core curriculum of another Texas public college or university are not required to complete the UT Southwestern core curriculum.

Applicants who attended non-public or out-of-state institutions of higher education or applicants who attended Texas public institutions without completing that institution's core curriculum must complete the UT Southwestern Allied Health Sciences School Core Curriculum prior to enrolling here. Core curriculum courses are not offered at UT Southwestern.

College Level Examination Program and Advanced Placement credit may be accepted for core curriculum requirements as long as such credit has previously been accepted and indicated on the applicant's transcript by a previously attended college or university.



■ ESSENTIAL FUNCTIONS

In addition to essential functions for all students (see Entrance Requirements in the Student Information section), each student in the Prosthetics-Orthotics Program must be able to:

- 1) Participate in supervised clinical activities for eight-hour days;
- 2) Demonstrate sufficient vision to perform such tasks as (but not limited to) interpreting a medical record, inspecting wounds and determining gait deviations;
- 3) Physically and visually utilize chemicals and power tools while following all appropriate safety precautions;
- 4) Demonstrate the physical capability to work in a prosthetics and orthotics laboratory for four-hour periods;
- 5) Demonstrate sufficient arm strength, balance, coordination and sensation to perform such activities as (but not limited to) patient casting, manual muscle testing, range-of-

motion testing, and soft-tissue and bony evaluations.

CURRICULUM

The Prosthetics-Orthotics Program is a two-year, upper-division curriculum that leads to a bachelor of science degree with academic eligibility to take the certification examinations of the American Board for Certification in Orthotics and Prosthetics. The course of study comprises two phases: a prerequisite phase and a professional phase.

During the prerequisite phase the student completes required and elective courses in liberal arts and physical and biological sciences.

The professional phase is completed at UT Southwestern Medical Center. The faculty combines educational, professional and technical skills in a coordinated approach to the academic and clinical aspects of the student’s education, offering an opportunity to attain the basic competencies necessary for an entry-level prosthetist and orthotist. Students also will engage in research projects and community service as a part of their learning experience.

■ **PROGRAM OF INSTRUCTION**

Junior Year

SUMMER	HOURS
HCS 4308 Human Anatomy (Lecture)	3
HCS 4309 Human Anatomy Dissection Laboratory	3
HCS 4207 Introductory Human Neuroanatomy	2
HCS 3407 Human Physiology	4
PO 3101 Prosthetic-Orthotic Techniques	<u>1</u>
<i>Total</i>	<i>13</i>

FALL

PO 3713 Lower-Extremity Orthotics I	7
PO 3415 Applied Prosthetics-Orthotics and Rehabilitation Technology I*	4
PO 3217 Seminar in Prosthetics and Orthotics I	2
HCS 3106 Introduction to Pathology	1
PO 3216 Biomechanics of Human Movement	<u>2</u>
<i>Total</i>	<i>16</i>

SPRING

PO 4523 Lower-Extremity Orthotics II	5
PO 4611 Spinal Orthotics	6
HCS 4230 Health Care Research	2
PO 3225 Seminar in Prosthetics and Orthotics II	<u>2</u>
<i>Total</i>	<i>15</i>

Senior Year

SUMMER	HOURS
PO 4513 Upper-Limb Orthotics	5
PO 4721 Upper-Limb Prosthetics	7
PO 3423 Applied Prosthetics-Orthotics and Rehabilitation Technology II*	4
<i>Total</i>	<i>16</i>

FALL

PO 3021 Lower-Limb Prosthetics I	10
PO 4205 Seminar in Prosthetics and Orthotics III	<u>2</u>
<i>Total</i>	<i>12</i>

SPRING

PO 4001 Lower-Limb Prosthetics II	10
PO 4403 Applied Prosthetics-Orthotics and Rehabilitation Technology III*	4
PO 4217 Seminar in Prosthetics and Orthotics IV	<u>2</u>
<i>Total</i>	<i>16</i>

Total hours : 88 at UT Southwestern, plus 60 hours of prerequisites. Changes must be approved by the program director.

*These courses may be taken during different semesters. Students also may take Applied Prosthetics-Orthotics and Rehabilitation Technology IV and V and HCS 3102 Interdisciplinary Health Care.

SPECIAL REQUIREMENTS

In addition to the general academic policies of the school, the Prosthetics-Orthotics Program requires that the student maintain a minimum 2.0 grade-point average. To pass a course for undergraduate credit, it is necessary to earn a grade of D or iPass.† Students must earn a grade of C or better in a prosthetics and orthotics course.

The student is advised to consult the program policy statement upon admission to the program.

COURSE DESCRIPTIONS

See other departmental listings in this catalog for descriptions of courses that do not begin with the prefix PO.

PO 3021 LOWER-LIMB PROSTHETICS I **10 SEMESTER HOURS**

Lectures address physical and functional deficits that result from limb loss following transtibial amputation. Differing levels of amputation; medical management; pre- and postoperative prosthetic care; prescription considerations; prosthetic materials and components; and principles of fabrication, fit and dynamic alignment also are covered. Techniques of evaluation and training for all transtibial types of amputations, in addition to instruction in fitting juvenile and geriatric patients, are offered. Students are introduced to CAD/CAM technology, including demonstrations in casting, digitization, carving fabrication and fitting of a transtibial socket.

PO 3101 PROSTHETIC-ORTHOTIC TECHNIQUES I **1 SEMESTER HOUR**

This introductory course is designed to familiarize the student with mechanical properties of materials, hand and power tools, and specialized equipment used in the fabrication of prostheses and orthoses. Proper safety techniques and operating procedures in the laboratory environment are stressed.

PO 3216 BIOMECHANICS OF HUMAN MOVEMENT **2 SEMESTER HOURS**

This course is designed to develop a fundamental understanding of the anatomical, neuromuscular and biomechanical principles of human movement. Emphasis is on the importance of mechanical principles in relation to analysis of the human body at rest and in motion, in both normal and pathological conditions.

PO 3217 SEMINAR IN PROSTHETICS AND ORTHOTICS I **2 SEMESTER HOURS**

This course introduces the student to topics that will aid in understanding the responsibilities associated with providing health care; establishing a successful orthotic and prosthetic practice;

understanding the roles and services of other health-care providers within the multidisciplinary team; and promoting orthotic and prosthetic care through continuing education, research and effective communication skills. These topics are presented by a myriad of experts from the prosthetics and orthotics community and other members of the multidisciplinary team.

The course also allows the student to keep abreast of current developments in the field through current literature reviews, clinical case presentations and clinical research presentations by faculty members and practitioners within the local prosthetics and orthotics community.

Also included in the course work is the opportunity for student research. During the junior year of study, students are expected to complete two term papers closely related to the field of prosthetics and orthotics. Students then are expected to prepare and present an oral/visual program drawn from the term paper material. During the senior year of study, students are expected to complete a clinical research study and to present the findings via oral/visual presentations to members of the local medical community.

Juniors and seniors attend combined classes, and the presentations are alternated biennially; therefore, there is no duplication of presentations throughout the two-year course of the program.

PO 3225 SEMINAR IN PROSTHETICS AND ORTHOTICS II **2 SEMESTER HOURS**

See course description for PO 3217.

PO 3415 APPLIED PROSTHETICS-ORTHOTICS AND REHABILITATION TECHNOLOGY I **4 SEMESTER HOURS**

This course is based upon clinical observations and supervised application of prosthetic-orthotic principles as they relate to patient assessment, prescription recommendation and fabrication techniques.

PO 3423 APPLIED PROSTHETICS-ORTHOTICS AND REHABILITATION TECHNOLOGY II **4 SEMESTER HOURS**

This course is based upon clinical observations and supervised application of prosthetic-orthotic principles in relation to patient assessment,

prescription recommendation and fabrication techniques.

**PO 3713 LOWER-EXTREMITY ORTHOTICS I
7 SEMESTER HOURS**

This course introduces the student to evaluation techniques, prescription considerations, biomechanics, components, fabrication and fitting of orthoses for the ankle and foot, with the associated pathologies. The anatomy of the foot and ankle are examined in detail. Normal and pathological gait are covered in detail. Each student fabricates and fits two foot orthoses, a UCBL orthosis, a conventional ankle-foot orthosis and three designs of plastic ankle-foot orthoses. Students immediately apply the principles and techniques presented in lecture during supervised laboratory practice. In addition, students are exposed to lower-extremity fracture management of the foot and ankle, as well as shoe fitting and modification principles.

**PO 4001 LOWER-LIMB PROSTHETICS II
10 SEMESTER HOURS**

This course includes the study of physical and functional deficits that result from limb loss following transfemoral amputation. Levels of amputation; medical management; pre- and post-operative prosthetic care; prescription considerations; materials and components; and principles of fabrication, fitting and dynamic alignment are presented. Evaluation and training for all transfemoral types of amputations are given with special attention to juvenile and geriatric patients. Instruction also is given in the use of fluid control mechanisms as well as various other types of knee units. In addition, methods of fitting hip and knee disarticulations are demonstrated. Students are introduced to CAD/CAM technology and options pertaining to transfemoral socket design.

**PO 4205 SEMINAR IN PROSTHETICS AND ORTHOTICS III
2 SEMESTER HOURS**

See course description for PO 3217.

**PO 4217 SEMINAR IN PROSTHETICS AND ORTHOTICS IV
2 SEMESTER HOURS**

See course description for PO 3217.

PO 4403 APPLIED PROSTHETICS-ORTHOTICS AND REHABILITATION TECHNOLOGY III

4 SEMESTER HOURS

This course is based upon clinical observations and supervised application of prosthetic-orthotic principles in relation to patient assessment, prescription recommendation and fabrication techniques.

PO 4415 APPLIED PROSTHETICS-ORTHOTICS AND REHABILITATION TECHNOLOGY IV

4 SEMESTER HOURS

This course is based upon clinical observations and supervised application of prosthetic-orthotic principles in relation to patient assessment, prescription recommendation and fabrication techniques.

PO 4423 APPLIED PROSTHETICS-ORTHOTICS AND REHABILITATION TECHNOLOGY V

4 SEMESTER HOURS

This course is based upon clinical observations and supervised application of prosthetic-orthotic principles in relation to patient assessment, prescription recommendation and fabrication techniques.

PO 4513 UPPER-LIMB ORTHOTICS

5 SEMESTER HOURS

Lectures relating to anatomy, kinesiology, biomechanics, pathomechanics, neurology and vascular supplies of the upper extremity are presented. In addition, instruction includes a section in orthotic components and materials as they pertain to shoulder, arm, wrist and hand disabilities. Special attention is given to fitting juvenile and geriatric patients. Laboratory practice is scheduled to allow the student to perform immediately the techniques and procedures described in lecture. Included in laboratory sessions are the evaluation of physical and functional deficits, recommendation of orthoses, selection of appropriate components, measurement, fabrication, fitting and evaluation of orthoses.

**PO 4523 LOWER-EXTREMITY ORTHOTICS II
5 SEMESTER HOURS**

This course introduces the student to evaluation techniques, prescription considerations, biomechanics, components, fabrication and fitting of

orthoses for the knee and hip, with associated pathologies. The anatomy of the knee and hip are examined in detail. Each student fabricates and fits a thermoplastic and a hybrid knee-ankle-foot orthosis. Students immediately apply principles and techniques presented in lecture during supervised laboratory practice. In addition, the student has the opportunity to learn the principles involved in reciprocating-gait orthoses as well as hip-knee-ankle-foot orthoses.

PO 4611 SPINAL ORTHOTICS
6 SEMESTER HOURS

Instruction in this course includes a review of spinal and pelvic anatomy, biomechanics and pathomechanics of the spine, materials and orthotic components, prescription considerations, and principles of fabricating spinal orthoses. Special attention is given to seating systems, as well as fitting juvenile and geriatric patients. Each student fabricates and fits a conventional and thermoplastic lumbar-sacral orthosis, as well as a thermoplastic thoraco-lumbar-sacral orthosis. Students immediately apply the principles and techniques presented in lecture during supervised

laboratory practice. Students also are given the opportunity to fit several prefabricated cervical and spinal orthoses.

PO 4721 UPPER-LIMB PROSTHETICS
7 SEMESTER HOURS

Course content includes a review of anatomy, kinesiology, biomechanics, pathomechanics, neurology and vascular supplies of the upper extremity. All levels of upper-extremity amputation are covered, including medical management, pre- and postoperative prosthetic care, prescription considerations, conventional and externally powered components, principles of fabrication, and harnessing. Special consideration is given to fitting juvenile and geriatric patients. Each student fabricates and fits two transradial prostheses and one transhumeral prosthesis.

Students immediately apply the principles and techniques presented in lecture during supervised laboratory practice. Students also are given the opportunity to learn upper-extremity prosthetic principles involved in juvenile and myoelectric control designs, as well as sports adaptations.