FIRST-PROFESSIONAL COURSES

School of Dentistry

Dental Biomedical Sciences (DEBS)

DEBS 501. Dental Gross Anatomy. 6.5 Hours.
Semester course; 4 lecture and 3 laboratory hours. 6.5 credits. A systematic dissection and study of the human body with clinical correlation and emphasis on the head and neck.

DEBS 502. Dental Neuroanatomy. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Through this course, students will develop broad-level knowledge of neuroanatomical structures and principles and the role of the nervous system. Dental clinical correlations will be used to illustrate the future clinical necessity for and application of this scientific background.

DEBS 503. Infection and Immunology. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Enrollment restricted to dental students in the first professional year; others admitted with permission of instructor. A course on the fundamentals of microbiology and immunology with aspects on disease and treatment of interest to dentistry.

DEBS 511. Microscopic Anatomy. 5 Hours.
Semester course; 2.5 lecture and 5.5 laboratory hours. 5 credits. A study of the normal tissues and organs of the human body at the microscopic level, with emphasis on the histological organization and development of the oral cavity.

DEBS 512. Physiology and Pathophysiology. 5 Hours.
Semester course; 5 lecture hours. 5 credits. A comprehensive study of the function of mammalian organ systems, designed primarily for dental students.

DEBS 513. Dental General Pathology. 6 Hours.
Semester course; 3 lecture and 6 laboratory hours. 6 credits. Instruction in the basic principles regarding alteration of structure and function in disease and in the pathogenesis and effect of disease in the various organ systems.

DEBS 601. Dental Pharmacology and Pain Control I. 4 Hours.
Yearlong course; 4 lecture hours. 4 credits. This course covers the study of the effects of chemical agents on the structure and function of living tissues, which may be normal or pathological. Provides a basic understanding of pharmacological principles and the basic concepts of currently accepted theories of pain mechanisms and provides a scientific basis for the use of therapeutic agents in order that the future dentist will be able to safely administer drugs to control pain by parenteral, oral or inhalation routes. Students receive CO grading in the fall and letter grade and earned credit in the spring.

DEBS 701. Dental Pharmacology and Pain Control II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: DEBS 601. The study of the effects of chemical agents on the structure and/or function of living tissues, which may be normal or pathological. Provides a basic understanding of pharmacological principles and the basic concepts of currently accepted theories of pain mechanisms and provides a scientific basis for the use of therapeutic agents in order that the future dentist will be able to safely administer drugs to control pain by parenteral, oral or inhalation routes.

Dental Special Topics (DENS)

DENS 501. Remediation in Dentistry D1. 1-7 Hours.
Semester course; 1-7 lecture hours. 1-7 credits. Enrollment is restricted to current dental students as directed by the Academic Progress Committee. This course is not part of the core D.D.S. curriculum. Students who must remediate a course, for any reason, will be enrolled in this course during their remediation period and credit hours will be assigned consistent with the course being remediated. This course is for remediation of D1 courses. A grade of pass/fail will be assigned at the completion of the remediation period.

DENS 503. Introduction to Behavioral Science in Dentistry. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Enrollment is restricted to students in a School of Dentistry degree program. Course consists of online lectures, discussion board activities, assigned readings and interactive activities centering on understanding health disparities and access to care issues as they relate to patient-centered care among diverse populations. Graded as pass/fail.

DENS 508. Dental Materials I. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This is the first in a series of four courses that provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on those materials used in operative dentistry. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 513. Foundations of Effective Interpersonal Skills During Patient Interactions I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Enrollment is restricted to students in a School of Dentistry degree program. Course consists of online and face-to-face lectures, skill-building activities, student role-plays and a standardized patient assessment. Students will work both individually and in small groups for discussion and role-plays utilizing foundational motivational interviewing techniques. Graded as Pass/Fail.

DENS 515. Clinical Skills I. 1 Hour.
Semester course. 1 credit. Provides didactic information and practice opportunities to familiarize first-year dental students with patient management and selected clinical skills. The course runs concurrently with courses in periodontics and operative dentistry to provide the basis for initial entry into the dental clinic and patient care.

DENS 516. Clinical Skills II. 3.5 Hours.
Semester course; 2 lecture, 1 laboratory and 2 clinical hours (weekly). 3.5 credits. Prerequisite: DENS 515. Enrollment is restricted to admitted dental students. The second in a two-part series of courses designed to prepare dental students for entry into the clinical training environment. Students' learning experiences include didactic lectures, clinical practice and observation, and simple patient-based interactions and/or procedures performed while assisting more senior dental students.

DENS 522. Preclinical Restorative Lecture I. 4 Hours.
Yearlong course; 4 lecture hours (2 lecture credits each semester). 4 credits. This is the first in a three-course preclinical didactic series on restorative dentistry including operative dentistry and fixed prosthodontics. This two-semester didactic course is paired with a two-semester laboratory course. Information is presented regarding caries as a disease process, and students are presented with the knowledge and develop the skills necessary to treat the disease with noninvasive as well as invasive operative treatment techniques. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 523. Preclinical Restorative Lab I. 4.5 Hours.
Yearlong course; 7 laboratory hours. 4.5 credits. This is the first in a three course pre-clinical laboratory series on restorative dentistry including operative dentistry and fixed prosthodontics. This two-semester course consists of laboratory exercises, including conventional mannequin simulation sessions, and is paired with a two-semester lecture course. Information is presented regarding caries as a disease process, and students are presented with the knowledge and develop the skills necessary to treat the disease with noninvasive as well as invasive operative treatment techniques. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 524. Evidence-based Dentistry and Critical Thinking I. 1 Hour.
1 credit. The fundamentals of evidence-based dentistry will be taught. Students will gain the ability to identify, retrieve and critically appraise dental literature.

DENS 532. Preclinical Restorative Lecture II. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. This is the second in a three-course preclinical didactic series on restorative dentistry including operative dentistry and fixed prosthodontics. This one-semester didactic course is paired with a one-semester laboratory course. Information is presented regarding caries as a disease process, and students are presented with the knowledge and develop the skills necessary to treat the disease with noninvasive as well as invasive operative treatment techniques. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form.

DENS 533. Preclinical Restorative Lab II. 1.5 Hour.
Semester course; 4.5 laboratory hours. 1.5 credits. This is the second in a three-course preclinical laboratory series on restorative dentistry including operative dentistry and fixed prosthodontics. This one-semester course consists of laboratory exercises, including conventional mannequin simulation sessions, and is paired with a one-semester lecture course. Information is presented regarding caries as a disease process, and students are presented with the knowledge and develop the skills necessary to treat the disease with noninvasive as well as invasive operative treatment techniques. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form.

DENS 550. Update in Practice Administration. 1 Hour.
Semester course; 15 seminar hours. 1 credit. Lectures and seminar discussion on the business aspects of contemporary specialty dental practice, with emphasis on entry into practice, associateship contracts, financing arrangements, risk management and employee relations.

DENS 580. Biostatistics and Research Design in Dentistry. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken for two consecutive semesters. Provides the advanced education student in dentistry an appreciation for the need for and uses of fundamental biostatistical methods in dental applications. Appropriate research designs for answering research questions of importance in dentistry will be examined. An array of biostatistical methods that are commonly used in the dental literature and by agencies such as the FDA to evaluate new dental products and methodologies are discussed.

DENS 591. Dental Special Topics I. 1-12 Hours.
Semester course; 1-12 lecture hours. 1-12 credits. May be repeated with different topics for a maximum of 24 credits. Explores specific topics in dentistry.

DENS 601. Remediation in Dentistry D2. 1-7 Hours.
Semester course; 1-7 lecture hours. 1-7 credits. Enrollment is restricted to current dental students as directed by the Academic Progress Committee. This course is not part of the core D.D.S. curriculum. Students who must remediate a course, for any reason, will be enrolled in this course during their remediation period and credit hours will be assigned consistent with the course being remediated. This remediation course is for remediation of D2 courses. A grade of pass/fail will be assigned at the completion of the remediation period.

DENS 603. Foundations of Effective Interpersonal Skills During Patient Interactions II. 2 Hours.
Yearlong course; 2 lecture hours. 2 credits. The two-semester course consists of online and face-to-face lectures, skill-building activities, student role-plays and a standardized patient assessment (spring). Students will work both individually and in small groups for discussion and role-plays of cases utilizing foundational motivational interviewing techniques. Students receive CO grading in the fall semester and a Pass/Fail grade upon completion.

DENS 604. Introduction to Oral Research. 0.5 Hours.
Semester course; .5 lecture hours. .5 credits. Enrollment is restricted to any dental student with a minimum GPA of 3.0 and in good academic standing. This course introduces students to oral research. Students will learn about different types of research and explore their personal research interests. Assignments will introduce students to experimental design and presenting research. Graded as pass/fail.

DENS 605. Writing an A.D. Williams Research Fellowship. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment is restricted to dental students with a minimum GPA of 3.0 and in good academic standing. Students will be introduced to writing a fellowship proposal. Lectures and workshops will guide students through the process of applying for an A.D. Williams fellowship. Students will also begin their independent research. Graded as pass/fail.

DENS 606. Oral Research: Independent Study. 0.5-2 Hours.
Semester course; 1.5-6 research hours. .5-2 credits (3 research hours per credit). May be repeated for a maximum total of 16 credits. Enrollment is restricted to dental students with a minimum GPA of 3.0 and in good academic standing. Independent study and individual research experiences will be conducted under the guidance of a research mentor. Graded as pass/fail.

DENS 607. D2 Clinical Dentistry I. 1 Hour.
Semester course; 3 clinical hours. 1 credit. This course begins the transition of the second-year dental student to clinical patient care of their family of patients. Students will engage in weekly patient care through chairside assisting of their D3 or D4 vertical buddy. Graded as pass/fail.

DENS 608. Dental Materials II. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. The second in a series of four courses. These courses provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on those materials used in prosthodontic dentistry. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 610. Fundamentals of Oral and Maxillofacial Radiology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course will introduce students to the principles, theory and techniques of diagnostic imaging.

DENS 611. Introduction to Professionalism, Ethics and Ethical Decision-making. 1 Hour.
Semester course. 1 credit. Provides a review of the foundation of ethical principles, concepts of professionalism, professional student behavior and responsibilities, ethical issues guiding dentistry, and the development of an ethical decision-making model.

DENS 617. D2 Clinical Dentistry II. 2 Hours.
Semester course; 6 clinical hours. 2 credits. This course continues the transition of the second-year dental student to clinical patient care of their family of patients. Students will engage in weekly patient care through chairside assisting of their D3 or D4 vertical buddy. Graded as pass/fail.

DENS 619. Evidence-based Dentistry and Critical Thinking II. 1 Hour.
1 credit. The fundamentals of evidence-based dentistry will be taught. Students will gain the ability to identify, retrieve and critically appraise dental literature.

DENS 621. Dental Occlusion. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Consists of lectures which expand on the basic concepts that were presented in the fundamentals of occlusion course. Focuses on the examination, diagnosis and treatment planning of various occlusal problems. The student will learn the skills needed to analyze the dental occlusion of patients and to plan successful occlusal therapy, including restorative procedures and fixed prosthodontics treatment.

DENS 622. Dental Occlusion Lab. 1.5 Hour.
Semester course; 4 laboratory hours. 1.5 credits. Consists of labs which expand on the basic concepts that were presented in the fundamentals of occlusion course. Focuses on the examination, diagnosis and treatment planning of various occlusal problems. The student will learn the skills needed to analyze the dental occlusion of patients and to plan successful occlusal therapy, including restorative procedures and fixed prosthodontics treatment. Graded as pass/fail.

DENS 627. D2 Clinical Dentistry III. 6.5 Hours.
Semester course; 9 clinic hours. 6.5 credits. This course serves as the start of the clinic-intensive portion of the D.D.S. program. Students will be assigned their own panel of patients for whom they will be responsible for management, diagnosis, treatment planning, clinical care and care coordination for the duration of dental school until graduation. Students will also rotate through specialty area clinics for the care of their own patients and other patients receiving care in the clinics. This is a multidisciplinary course incorporating clinics within each department in the School of Dentistry. Graded as pass/fail.

DENS 628. Introduction to Dental Public Health. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course will introduce dental students to issues related to the role of the dental professional at a local and state level, including dental public health, health equity, health literacy, oral health disparities, the role of publicly funded dental programs and the dental safety net.

DENS 630. Orthodontic-Periodontic-Prosthodontic-AEGD Conference. 0.5 Hours.
Semester course; 0.5 seminar hours. 0.5 credits. May be repeated for a maximum of 3 credits. Discusses treatment planning and analysis of patients requiring combined orthodontic, periodontic and restorative care. Presents topics of interest to orthodontists, periodontists, prosthodontists, and general dentists. Graded as satisfactory/unsatisfactory.

DENS 632. Preclinical Restorative Lecture III. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This is the third in a three-course preclinical didactic series on restorative dentistry including operative dentistry and fixed prosthodontics. This one-semester didactic course is paired with a one-semester laboratory course. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form.

DENS 633. Preclinical Restorative Lab III. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. This is the third in a three-course preclinical laboratory series on restorative dentistry including operative dentistry and fixed prosthodontics. This one-semester course consists of laboratory exercises, including conventional mannequin simulation sessions, and is paired with a one semester-lecture course. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form.

DENS 642. Fundamentals of Treatment Planning. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open only to second-year D.D.S. students. Designed to build upon the student's prior exposure to discipline-based treatment planning concepts. Students will develop an integrated, multidisciplinary approach to urgent and oral disease control phase patient treatment planning. The course will also cover the use of information technology applications to document treatment plans and strategies for effectively communicating treatment plans to patients. Graded P/F.

DENS 651. Preclinical General Practice Dentistry Lab. 5 Hours.
Semester course; 200 laboratory hours. 5 credits. Admission into VCU International Dentist Program required. Designed to prepare and transition a class of internationally trained dentists into the third year of dental school at VCU. All aspects of preclinical dentistry will be covered in this basic preparatory laboratory course. Graded P/F.

DENS 652. Preclinical General Practice Dentistry Lecture. 9 Hours.
Semester course; 144 lecture hours. 9 credits. Admission into VCU International Dentist Program required. Designed to prepare and transition a class of internationally trained dentists into the third year of dental school at VCU. All aspects of preclinical dentistry will be covered in this basic preparatory lecture course. Graded P/F.

DENS 653. Clinical General Practice Dentistry Lecture. 6 Hours.
Semester course; 96 lecture hours. 6 credits. Admission into VCU International Dentist Program required. Comprises clinical experiences prior to the third year of professional study. This course is designed to enhance the student's clinical experience in patient management, treatment planning, utilization of dental auxiliaries, consultation with other health care professionals and referral to appropriate dental specialists. Specialty subjects and techniques will be combined to form a general dentistry model for patient care. Guidance from faculty will encourage the student to synthesize and integrate materials, methods and techniques from previous courses into a logical and systematic approach to the delivery of oral health care. Small-group seminars will be provided to enhance the student's transition to dental health care at VCU. Graded P/F.

DENS 654. Clinical General Practice Dentistry Lab. 5 Hours.
Semester course; 200 laboratory hours. 5 credits. Enrollment requires admission into the VCU International Dentist Program. Prerequisite: DENS 652. Comprises clinical experiences prior to the third year of professional study. This course is designed to enhance the student's clinical experience in patient management, treatment planning, utilization of dental auxiliaries, consultation with other health care professionals and referral to appropriate dental specialists. Specialty subjects and techniques will be combined to form a general dentistry model for patient care. Guidance from faculty will encourage the student to synthesize and integrate materials, methods and techniques from previous courses into a logical and systematic approach to the delivery of oral health care. Small-group seminars will be provided to enhance the student's transition to dental health care at VCU. Graded pass/fail.

DENS 655. Preclinical General Practice Dentistry for Internationally Trained Dentists. 6 Hours.
Yearlong course; 6 lecture hours. 6 credits. Designed to support the integration of a class of internationally trained dentists into the second year at the VCU School of Dentistry, this course addresses special topics of concern for this cohort. The course will cover core didactic material and laboratory activities and will strengthen areas that have been previously identified as opportunities for growth in this student population. Students receive CO grading in the fall and a pass or fail grade and earned credit in the spring.

DENS 660. Interdisciplinary Care Conference. 0.5 Hours.
Continuing course; 7 hours. 1 credit. Must be taken every year of the program. Provides a forum for formal presentation and group discussion of the diagnosis, treatment planning, delivery and prognosis of interdisciplinary dental care. Designed for continuing enrollment for two academic semesters; graded CO in the fall and a final grade of Pass or Fail in the spring.

DENS 662. Advanced Restorative and Digital Dentistry Lecture. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Extensive didactic instruction and laboratory simulation experience is provided in different restorative techniques with focused education on digital dentistry. Experience is also provided concerning CAD/CAM techniques, CAD/CAM materials, esthetic dentistry and intraoral photography. This course is constructed in a way that simulates dental CE courses and is paired with a laboratory course.

DENS 663. Advanced Restorative and Digital Dentistry Lab. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. This course consists of laboratory exercises using conventional mannequin simulation, modern dental materials/equipment and digital dentistry technologies. Extensive laboratory simulation experience is provided in different restorative techniques with focus on digital dentistry. Experience is also provided concerning CAD/CAM techniques, CAD/CAM materials, esthetic dentistry and intraoral photography. The course is constructed in a way that simulates dental CE courses and is paired with a didactic course. Graded as pass/fail.

DENS 680. Graduate Dental Clinic. 1-4 Hours.
Semester course; 3-12 clinic hours. 1-4 credits. May be repeated for a maximum of four credits. Enrollment is restricted to students in the Master of Science in Dentistry program. This course provides supervised experiences in advanced clinical skills. Students will enhance their skills in diagnosis and treatment planning, patient communication, professional and ethical care, and collaboration with other health care providers. Sections of the course will address specialty-specific treatments. Graded as pass/fail.

DENS 691. Dental Special Topics II. 1-12 Hours.
Semester course; 1-12 lecture hours. 1-12 credits. May be repeated with different topics for a maximum of 24 credits. Explores specific topics in dentistry.

DENS 699. Thesis Guidance. 1-2 Hours.
Semester course; 18-36 seminar hours. 1-2 credits. Must be taken every semester of the program. The graduate student selects a research project topic, conducts the necessary background literature review, develops a protocol, obtains the necessary materials, instruments and human/animal use approvals as necessary, collects and analyzes the data, presents the findings in the form of a master's thesis, and prepares a manuscript for publication.

DENS 700. Basic Sciences and Graduate Dentistry. 3 Hours.
First year; spring course; 45 hours. 3 credits. Advanced level survey of topic areas related to the principles and practices of dentistry including: oral pathology, biochemistry and physiology, infection and immunity, pharmacology, biomaterials and genetics.

DENS 701. Remediation in Dentistry. 1-7 Hours.
Semester course; variable contact hours. Variable credits. This course is not part of the core D.D.S. curriculum. Students who must remediate a course, for any reason, will be enrolled in this course during their remediation period and credit hours will be assigned consistent with the course being remediated. A grade of pass/fail will be assigned at the completion of the remediation period.

DENS 702. Dental Clinics. 1-12 Hours.
Semester course; variable hours, clinical contact. 1-12 credits. May be repeated for credits. Restricted to students enrolled in D.D.S. program. This course is designed for students who need to remediate clinical experiences, make up clinical experiences or are off cycle with clinical work for any other reason. Credit hours, learning objectives and exact expectations/responsibilities will be identified in an individualized education plan for each student as determined by the school's deans for clinical education and academic affairs. Graded pass/fail.

DENS 704. Academic Dental Career Exploration Elective. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Exact contact hours will vary by student and their self-designed learning plan. Enrollment restricted to students in the D.D.S. program with permission of the course director. This is an elective course for D2, D3 or D4 dental students who are interested in learning more about academic dental teaching and/or research careers. The course matches each student with a faculty mentor who provides insight into the day-to-day life of an educator or researcher. This elective is modeled on the ADEA Academic Dental Careers Fellowship Program. Graded as Pass/Fail.

DENS 705. CAD/CAM Senior Selective. 0.5 Hours.
Semester course; 0.5 clinic hours. 0.5 credits. Clinic time may be weekly, in block rotation or variable schedule. Students must enroll in this course for two consecutive semesters. This is a selective course with focused education on digital dentistry. Experience is also provided concerning CAD/CAM techniques, CAD/CAM materials and intra-oral photography. This course is constructed in a way that simulates dental CE courses. Graded as Pass/Fail.

DENS 706. Laser Senior Selective. 0.5 Hours.
Semester course; 0.5 lecture hour. 0.5 credits. Students must enroll in this course for two consecutive semesters. This elective course is offered to dental students who demonstrate high academic achievement and are interested in expanding their practical knowledge and experience in laser applications in dentistry. The goal of the course is to provide dental students opportunities for the integration and application of theoretical, evidence-based and clinical knowledge to the individual's practice of laser dentistry in a controlled, student-centered environment. This course is aimed to provide additional discipline-specific treatment experiences and expand upon previously learned ethical and patient management skills. The course will enhance the general dentist's knowledge regarding applications of various lasers for dental procedures and to provide hands-on simulation experience in applying techniques and procedures suitable for judicious use in general dental practice. The course consists of didactic components, small-group seminars, model-based simulations and clinical assisting. Upon completion of this course, students will have a scientific and clinical basis for understanding various dental lasers and their applications for dental and surgical procedures. Graded as Pass/Fail.

DENS 707. Dental Sleep Medicine Senior Selective. 0.5 Hours.
Semester course; .25 lecture and 0.5 clinical hours. 0.5 credit. Students must enroll in this course for two consecutive semesters. The course provides exposure to the discipline of dental sleep medicine and will introduce students to sleep and how it relates to dental sleep medicine. Students will also be introduced to the treatment of obstructive sleep apnea, including hands-on fabrication of appliances and delivery. This select course will also present side effects to the students, as well as how to manage them and follow-up care for oral appliance therapy for OSA. The goal of this course is to have the students obtain knowledge in the scope of dental sleep medicine and to encourage further training if they want to implement this in future practice. Graded as Pass/Fail.

DENS 708. Dental Materials III. 1 Hour.
Continuous course; 1 lecture hour. 1 credit. The final course in a series of three. The courses provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of the final course are to provide the student with knowledge of 1) the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on applying dental materials knowledge to clinical practice. Student-led seminars will be adopted, wherein students will be divided into groups and a specific topic will be assigned to each group. The seminars will improve the students in terms of critical-thinking, working in teams and presentation skills. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 710. Selective in Advanced Interpersonal Skills. 1 Hour.
Semester course; 0.5 lecture and 0.5 clinic hour. 1 credit. Enrollment is subject to selection criteria and permission of the course director. This is a one-semester elective course which applies the philosophy and skills of prior program course work in an authentic patient setting. The course consists of in-clinic observation and classroom sessions. Students will receive feedback on patient interactions and opportunities to build off of specific patient interactions or behaviors over the course of the semester. Students will work both individually and in small groups for discussion and role-plays of cases utilizing foundational motivational interviewing techniques. Graded as Pass/Fail.

DENS 714. Peer Instruction in Dental Special Topics. 0.25-2 Hours.
Semester course; 0.25-2 lecture/laboratory hours. 0.25-2 credits. Enrollment is restricted to students in the Doctor of Dental Surgery program with permission of the course director. This is a peer-led course on special topics in dentistry. Instructors are student peers under the direction of a faculty advisor. Exact contact hours will vary by depending on the nature of the topic covered. Credits earned will not count toward degree completion. Graded as pass/fail.

DENS 718. Dental Materials IV. 0.5 Hours.
Yearlong course; 0.5 lecture hours. 0.5 credits. The fourth in a series of four courses. These courses provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on applying dental materials knowledge to clinical practice and helping students to make independent decisions on materials choice in clinical dentistry, thus preparing them for life after dental school. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 727. D3 Clinical Dentistry. 8 Hours.
Semester course; 24 clinic hours. 8 credits. Clinic time may be weekly, in block rotation or variable schedule. This course serves as a continuation of the clinic-intensive portion of the D.D.S. degree program. Students will continue to treat their own panel of patients for whom they are responsible for management, diagnosis, treatment planning, clinical care and care coordination for the duration of dental school until graduation. Students will also rotate through clinical specialty area clinics for the care of their own patients and other patients receiving care in the specialty clinics. Off-site clinical experiences also begin during this semester. This is a multidisciplinary course incorporating clinics within each department in the School of Dentistry as well as external clinic rotation sites. Graded as pass/fail.

DENS 730. Dental Practice Management III. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course is part of a series. The series will prepare the dental graduate for making decisions about the type of practice to pursue, planning to establish or purchase a practice and, ultimately, managing it once in operation. Topics covered are those appropriate to the third-year dental student and may include, but are not limited to, marketing a practice, selecting the right location, ergonomics and managing the dental office. Graded as Pass/Fail.

DENS 735. Patient Management and Professional Conduct I. 5 Hours.
Yearlong course; 5 clinical hours. 5 credits. Designed for third-year dental students to understand and practice the concepts of ethical conduct, patient management, risk management and professional responsibility. This course is based upon the application of the VCU School of Dentistry Code of Professional Conduct, the ADA Principles of Ethics and Code of Professional Conduct, and the School of Dentistry's Patient Bill of Rights in the clinical setting and is designed to help the dental student strive to do what is right for their patients, now and into the future. Course graded as CO with no credit for fall semester; pass/fail grade and credit assigned for spring semester.

DENS 740. Dental Practice Management IV. 1 Hour.
Semester course; 1 credit. The fourth in a series of four courses required over the duration of the four-year DDS curriculum. The series will prepare the dental graduate for making decisions about the type of practice to pursue, planning to establish or purchase a practice and, ultimately, managing it once in operation. Topics covered are those appropriate to the senior dental student and may include, but are not limited to, writing a business plan and understanding the current economy and its impact on dental practice. Graded as P/F.

DENS 745. Patient Management and Professional Conduct II. 5 Hours.
Yearlong course; 5 clinical hours. 5 credits. Designed for fourth-year dental students to understand and practice the concepts of ethical conduct, patient management, risk management and professional responsibility. This course is based upon the application of the VCU School of Dentistry Code of Professional Conduct, the ADA Principles of Ethics and Code of Professional Conduct, and the School of Dentistry's Patient Bill of Rights in the clinical setting and is designed to help the dental student strive to do what is right for their patients, now and into the future. Course graded as CO with no credit for fall semester; pass/fail grade and credit assigned for spring semester.

DENS 752. Clinical General Practice Dentistry. 13 Hours.
Yearlong course; 19.5 clinic hours. 13 credits. Clinic time may be weekly, in block rotation or variable schedule. Enrollment is restricted to fourth-year dental students. Course encompasses all clinical patient care instruction within the School of Dentistry group practices. This course is designed to enhance the student's clinical experience in patient management, treatment planning, utilization of dental auxiliaries, consultation with other health care professionals and referral to appropriate dental specialists. Students receive CO grading in the fall and a letter grade and earned credit in the spring.

DENS 753. D4 Treatment Planning Seminar. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This course is the capstone treatment planning experience within the D.D.S. curriculum. Students will independently develop and apply a five-phase treatment planning approach to a clinical patient while providing sound justification for diagnoses and treatment planning decisions. Active patients of record will serve as clinical case studies. This course renders a CO in the fall semester and a letter grade in spring.

DENS 762. Clinical Service-learning. 4 Hours.
Yearlong course; 6 clinic hours. 4 credits. Clinic time may be weekly, in block rotation or variable schedule. A course-based, credit-bearing educational experience in which students participate in an organized service activity that meets community-identified needs. During the course, students are assigned rotations in clinical practice settings in underserved areas. In these settings, students are exposed to patients of varied ethnic, socioeconomic and demographic backgrounds, as well as special patient populations not typically encountered in the School of Dentistry clinics. Students have the opportunity to make oral health care more accessible to marginalized groups while continuing clinical education. Throughout this unique learning experience students are exposed to the benefits of potential practice in public health dentistry. Students will reflect on the service activity to increase understanding and application of course content and to enhance a sense of civic responsibility. Course graded as CO with no credit for fall semester; letter grade and credit assigned for spring semester.

DENS 763. Clinical Externship. 0.5 Hours.
Semester course; 1.5 clinic hours. 0.5 credits. May be repeated, but this is an elective course that does not count toward degree requirements. Externships are short-term professional learning experiences. This course is designed to provide externships for motivated students who want to gain professional experience beyond general dental education and determine interest in pursuing a specialty. Externships may include general dentistry or dental specialties in educational, governmental or other clinical settings. Graded as Pass/Fail.

DENS 770. Community Dental Health/Dental Public Health. 1 Hour.
Semester course; 1 lecture hour (delivered online). 1 credit. This course uses examples and issues in dentistry and dental public health as a strategy for understanding health policy, the market for dental care and public health program development at the local, state and national levels. Graded as Pass/Fail.

DENS 780. Functional Occlusion: From TMJ to Smile Design Selective. 1.5 Hour.
Yearlong course; 1 lecture and 1 laboratory hour. 1.5 credits. Enrollment restricted to selected D4 dental students and AEGD residents. The course consists of lectures and clinic/laboratory components, which expand on the basic concepts that were presented in core D.D.S. curriculum. Students receive CO grading in the fall and Pass/Fail grade and earned credit in the spring.

DENS 781. Predictable Restorative Outcomes With Complex Wear Cases Selective. 1 Hour.
Semester course; 0.75 lecture and 0.25 laboratory hours. 1 credit. Enrollment is restricted to fourth-year D.D.S. students. The course seeks to prepare motivated dental students with advanced skills in diagnosis, treatment planning and treatment of occlusal disease. The goal of the course is to expand on their pre-doctoral occlusal knowledge. Graded as Pass/Fail.

DENS 790. Selective: Applications of 3-D Printing in Dentistry. 1 Hour.
Yearlong course; 1 lecture and .5 clinic hours. 1 credit. Enrollment is restricted to students admitted to D.D.S. program and selected by course faculty. The course has three components: 1) an online self-learning module on basic principles of 3-D printing and its applications in biological science and health science, as well as principle and workflow for implant-guided surgery, 2) a workshop on implant treatment planning using commercially available software and 3-D printing of models and surgical guide and 3) a patient-based observation experience in implant-guided surgery. The course is designed for students to use the most up-to-date digital technology to diagnose and treat real clinical cases. Students receive CO grading in the fall and pass/fail grade and credit are awarded in spring.

DENS 791. Dental Special Topics III. 1-12 Hours.
Semester course; 1-12 lecture hours. 1-12 credits. May be repeated with different topics for a maximum of 24 credits. Explores specific topics in dentistry.

Endodontics (ENDO)

ENDO 522. Introduction: Specialty of Endodontics. 2 Hours.
Semester course; 96 laboratory hours. 2 credits. Restricted to first-year students. Utilizes laboratory exercises to review basic concepts and introduce the more complex technical procedures required to practice the clinical specialty of endodontics.

ENDO 530. Advanced Oral Pathology. 1 Hour.
Semester course; 13 seminar hours. 1 credit. Provides through a series of seminars, an in-depth knowledge of those specific areas of oral pathology that apply to endodontics.

ENDO 532. Management of Medical Emergencies in the Dental Office. 1 Hour.
Semester course; 20 seminar hours. 1 credit. Provides through a series of seminars, an in-depth level of knowledge in the management of medical emergencies in the dental office.

ENDO 560. Endodontic Therapy Lectures. 3.5 Hours.
Semester course; 58 lecture hours. 3.5 credits. Restricted to first-year students. Presents a series of lectures on clinical endodontic topics in order to familiarize the students with clinical endodontic procedures either in conjunction with or prior to the "Endodontic Topic Literature Reviews" on these specific clinical topics.

ENDO 622. Principles of Endodontics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Covers the basic principles of endodontics in preparation for clinical endodontics.

ENDO 623. Principles of Endodontics Lab. 1.5 Hour.
Semester course; 4 laboratory hours. 1.5 credits. This lab course teaches the basic technical skills of endodontics in preparation for clinical endodontics.

ENDO 650. Endodontic Topic Literature Review. 3.5 Hours.
Semester course; 58 seminar hours. 3.5 credits. May be repeated for credit. Must be taken every semester of the program. Reviews topic literature pertaining to the scientific basis for endodontic procedures and the materials and techniques utilized in the clinical practice of endodontics. Discusses content of the reviewed literature and critically evaluates by means of abstracts and study questions.

ENDO 652. Endodontic Clinical Seminars. 1.5 Hour.
Semester course; 28 seminar hours. 1.5 credits. May be repeated for credit. Must be taken every semester of the program. Requires students to present a seminar once each month in which difficult diagnostic cases, patient management problems and complex treatment cases are critiqued and treatment options discussed.

ENDO 654. Endodontic Management of the Medically Compromised Patient. 1 Hour.
Semester course; 14 seminar hours. 1 credit. Must be taken for two consecutive semesters. Provides students, through a seminar series, with an in-depth level of knowledge in the endodontic management of the medically compromised patient.

ENDO 656. Endodontic Current Literature Review. 1 Hour.
Semester course; 18 seminar hours. 1 credit. Must be taken every semester of the program. Provides a review of current journal literature that pertains to the scientific basis for endodontic procedures, materials and techniques currently being used in the clinical practice of endodontics. Discusses and critically evaluates the content of the reviewed literature. Requires written abstracts of all reviewed articles.

ENDO 680. Clinical Endodontics. 1-12 Hours.
Semester course; 3-36 clinic hours. 1-12 credits. May be repeated for a maximum of four credits. Enrollment is restricted to students in the Master of Science in Dentistry program. This course provides clinical training in diagnosis, treatment and outcome assessment for all aspects of endodontics with an emphasis on non-surgical, retreatment and surgical endodontics. Must be taken both fall and spring of the first and second years of the program for a total of four credits. May be taken as needed to complete clinical training but additional credits will not count toward degree completion.

ENDO 700. Senior Selective in Advanced Clinical Endodontics. 0.5 Hours.
Semester course; 0.5 clinic hours. 0.5 credits. Clinic time may be weekly, in block rotation or variable schedule. Students must enroll in this course for two consecutive semesters. The course is designed to enhance the student's clinical experience in the field of endodontics, to include patient management, treatment planning, endodontic treatment modalities, consultation with other health care professionals and referral to appropriate dental specialists. Emphasis is placed on the management of common and advanced clinical endodontic problems that may be encountered in the general practice of dentistry. Guidance from faculty will encourage the student to synthesize and integrate techniques taught in previous endodontic courses and labs into a logical and systematic approach to the delivery of quality endodontic care to the patients. Graded as pass/fail.

ENDO 731. Endodontic Therapy. 1 Hour.
Semester course; 1 lecture contact hour. 1 credit. An application course designed for the student to gain experience and demonstrate proficiency in the application of clinical endodontic knowledge to the diagnosis and management of complex clinical endodontic problems. Emphasis is placed on differential diagnosis and management of clinical endodontic problems. This course builds on the principles of diagnosis and treatment of disease of the pulp and periradicular tissues and injuries of the dental pulp. This course continues to place emphasis on the prevention of disease and maintenance of the normal pulpodentin complex.

ENDO 739. Clinical Endodontics III. 1.5 Hour.
Yearlong clinical course. 2 clinic hours. 1.5 credits. Designed to develop clinical skills and provide experience in the diagnosis, treatment planning, treatment, prognosis, follow-up care and clinical patient management in cases involving the pulp and periradicular tissues. Emphasis is placed on the management of common clinical problems that may be encountered in the general practice of dentistry. This course emphasizes and elaborates on the rationale and treatment techniques presented in the D-2 didactic and laboratory course. Students receive CO grading in the fall and a letter grade and earned credit in the spring.

ENDO 749. Clinical Endodontics IV. 1.5 Hour.
Yearlong course; 2 clinic hours. 1.5 credits. Clinic time may be weekly, in block rotation or variable schedule. This course is designed to enhance the student's clinical experience in the field of endodontics, to include patient management, treatment planning, endodontic treatment modalities, consultation with other health care professionals and referral to appropriate dental specialists. Emphasis is placed on the management of common clinical endodontic problems that may be encountered in the general practice of dentistry. The course will run the fall and spring semester of the dental student's fourth year. Guidance from faculty will encourage the student to synthesize and integrate techniques taught in previous endodontic courses and labs into a logical and systematic approach to the delivery of quality endodontic care to the patients. Students receive CO grading in the fall and a letter grade and earned credit in the spring.

General Practice (GENP)

GENP 511. Dental Anatomy. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. A lecture course designed to develop the student's knowledge of the morphology and anatomical features of the human adult dentition.

GENP 512. Operative Dentistry Lecture. 4 Hours.
Yearlong course; 67 lecture contact hours. 4 credits. Paired with GENP 513, the courses consist of lectures and laboratory exercises, including both virtual reality-based training and conventional mannequin simulation sessions. Information is presented regarding caries as a disease process, and students are presented with the knowledge and develop the skills necessary to treat the disease with both non-invasive and invasive operative treatment techniques. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form. Students receive a grade of CO for fall, with a grade and all credit hours earned in spring.

GENP 513. Operative Dentistry Laboratory. 4.5 Hours.
Yearlong course; 213 laboratory contact hours. 4.5 credits. Paired with GENP 512, the courses consist of lectures and laboratory exercises, including both virtual reality-based training and conventional mannequin simulation sessions. Information is presented regarding caries as a disease process, and students are presented with the knowledge and develop the skills necessary to treat the disease with both non-invasive and invasive operative treatment techniques. Extensive didactic instruction and laboratory simulation experience is provided in tooth preparation and restoration. Experience is also provided concerning properties, chemistry and manipulation of the various direct dental restorative materials used to restore teeth to their correct anatomical and functional form. Students receive a grade of CO for fall, with a grade and all credit hours earned in spring.

GENP 514. Fundamentals of Occlusion. 2 Hours.
Semester course; 1 lecture and 3 laboratory contact hours. 2.0 credits. Covers theories of occlusion, foundational concepts and fundamental lab skills essential for developing an understanding of occlusion. Through this course students begin to develop their working understanding of the concept of occlusion.

GENP 519. Dental Anatomy and Occlusion Lecture. 2 Hours.
Continuous course; 2 lecture hours. 2 credits. Concurrent prerequisite: GENP 519. Enrollment is restricted to students in the Doctor of Dental Surgery program. Lecture course designed to develop the student's foundational knowledge and ability to recognize and describe the morphology, anatomical features and fundamental occlusion of the human dentition. Course renders a CO grade in the fall and a letter grade in the spring.

GENP 520. Dental Anatomy and Occlusion Lab. 2 Hours.
Continuous course; 6 laboratory hours. 2 credits. Concurrent prerequisite: GENP 519. Enrollment is restricted to students in the Doctor of Dental Surgery program. The laboratory course is designed to develop students' abilities to replicate the morphology and anatomical features of the human adult dentition, and its role in occlusion. Module 3 of the course is focus in clinical practice. The course renders a CO grade in the fall and a letter grade in the spring.

GENP 521. Dental Anatomy Lab. 1.5 Hour.
Semester course; 4.5 laboratory hours. 1.5 credits. A laboratory course designed to develop the student's knowledge of the morphology and anatomical features of the human adult dentition.

GENP 552. Emergency Clinic. 1 Hour.
Semester course; clinical hours. 1 credit. Part of the AEGD curriculum, students must enroll in this course for two consecutive semesters for a total of 2 credits. Students learn how to identify and manage emergency care needs of patients during evening and weekend hours when VCU dental practices are closed.

GENP 558. General Dentistry Seminar. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Part of the AEGD curriculum, students must enroll in this course for two consecutive semesters for a total of 2 credits. Students will participate in discussions of resident patient cases and relative current literature.

GENP 566. Specialty Lecture Seminar Series. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Part of the AEGD curriculum, students must enroll in this course for two consecutive semesters for a total of 2 credits. Covers a range of dental interdisciplinary topics and is designed to develop advanced critical thinking skills in AEGD residents.

GENP 580. AEGD Clinic. 1-6 Hours.
Semester course; clinical hours. 6 credits. Part of the AEGD curriculum, students must enroll in this course for two consecutive semesters for a total of 12 credits. Provides the core clinical patient care experience for residents in the Advanced Education in General Dentistry residency program.

GENP 590. Advanced AEGD Clinic. 6 Hours.
Semester course; 18 clinical hours. 6 credits. This is a clinical study and experiential course in advanced general dentistry designed to prepare the second-year residents of the AEGD program for the practice of dentistry at a higher level than that achieved during the first-year resident course of study. It is expected that the resident will evaluate each patient's general and oral health needs, provide professional dental care and refer the patient, when indicated, to dental specialists or other appropriate health care providers while maintaining a strong continuity of care. The AEGD resident will develop professionally not only in the clinical aspect, but in the ability to think critically. AEGD students must enroll in this course for two consecutive semesters for a total of 12 credits. Graded as pass/fail.

GENP 620. Cariology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Designed to help students understand major aspects of cariology, which include the process of dental caries, diagnosis and detection, prevention and treatment, and clinical application.

GENP 700. Selective in Aesthetic Dentistry. 1 Hour.
Semester course; 16 seminar contact hours. 1 credit. Prerequisites: D4 standing and selection by course faculty. This course is designed to give the tools in understanding proper diagnosis, treatment planning and approaches in execution of the proposed treatment plan of more advanced multidisciplinary cases. Graded as pass/fail.

GENP 739. Clinical Operative III. 5 Hours.
Yearlong course; clinical contact hours. 5 credits. Will introduce dental students to the basic skills required for an entry-level general practitioner. This is a practical, hands-on two-semester clinical skill-development course where students learn to develop treatment plans for oral disease control in patients, restore teeth to form and function, manage emergency patients and manage an efficient recall system.

GENP 742. Treatment Planning Seminar. 2 Hours.
Semester course; 4 seminar hours. 2 credits. Designed to assist each D-3 student in the continual development of their treatment planning skills in particular and critical-thinking skills in general. The treatment planning seminar utilizes faculty-facilitated, case-based and problem-solving teaching strategies to provide each student with the opportunity to gain experience in developing and discussing treatment plans for both simulated and current clinical comprehensive care patients. The course will build on and solidify the concepts of diagnosis and treatment planning taught in the various D-1, D-2 and D-3 courses as well as augment student clinical experiences to date.

Oral Diagnostic Sciences (ORPT)

ORPT 540. Clinical Pathology Conference. 1 Hour.
Semester course; seminar hours. 1 credit. Through this course, students develop advanced skills in the diagnosis and treatment of common oral pathologic findings.

ORPT 620. Oral Radiology I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment is restricted to students in the D.D.S. program. Oral and maxillofacial radiology is the specialized area of dentistry that deals with use of radiant energy for diagnosis of diseases and conditions affecting the head and neck. Through a series of lectures and laboratories, the course will introduce students to the basic physics of X-radiation, its biological effects on living systems, characteristics of radiographic images and fundamentals of intraoral and panoramic radiography in dentistry.

ORPT 621. Dental Radiology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to provide the predoctoral dental student with an introduction to the theory, principles and techniques of diagnostic imaging and lay the groundwork for future studies in diagnostic interpretation.

ORPT 622. Oral Pathology. 4 Hours.
Continuous course; 4 lecture hours. 4 credits. A problem-solving/critical-thinking experience emphasizing the more common oral abnormalities. The soft tissue and osseous pathologic entities will be discussed individually as well as within differential diagnosis cluster. By the end of the course the student should, when presented with an abnormality, be able to establish a differential diagnosis, discuss the salient features and present a logical sequential approach to discovering the final diagnosis and management. Course renders a CO grade in the fall and a letter grade in the spring.

ORPT 623. Temporomandibular Disorders and Orofacial Pain. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Dentistry is one of the primary health care professions that is involved in evaluation, diagnosis, prevention and management of temporomandibular disorders. This course is designed to provide an overview of TMDs as a syndrome.

ORPT 700. Oral Diagnostic Sciences Radiology Senior Selective. 0.5 Hours.
Semester course; 1.5 laboratory hours. 0.5 credit. Radiology lab time may be weekly, in block rotation or variable schedule. Enrollment is restricted to students with D4 class status and who are selected to participate. Students must enroll in this course for two consecutive semesters. This selective will allow the student to experience a variety of activities in oral and maxillofacial radiology. The course will be of particular value to those interested in practicing general dentistry, in particular utilizing the applications of CBCT imaging in diagnosis, treatment planning and digital dentistry. The course will also introduce modern practice of oral and maxillofacial radiology and new trends in dental teleradiology. Graded as pass/fail.

ORPT 701. D4 Selective in Forensic Dentistry. 1 Hour.
Semester course; .5 lecture and 1.5 clinical hours. 1 credit. Enrollment restricted to students in the D.D.S. program as selected by the course director. This course will give selected students with an interest in expanding beyond the normal curriculum the opportunity to experience a variety of dental forensic activities, including working with the chief medical examiner's office in Richmond in the proper identification of unidentified bodies. Graded as Pass/Fail.

ORPT 702. Oral Diagnostic Sciences Orofacial Senior Selective. 0.75 Hours.
Semester course; 2 clinical hours. 0.75 credits. Enrollment is restricted to students with D4 class status and who are selected to participate. Students must enroll in this course for two consecutive semesters. This selective will allow the student to experience a variety of activities in orofacial pain. Students will develop the skills to take detailed patient histories, create thoughtful differential diagnoses, critically evaluate conditions, write prescriptions and interact with other health care providers. By the end of the course, students will be proficient in recognizing and managing conditions such as TMD and atypical facial pain. Graded as Pass/Fail.

ORPT 703. Oral Diagnostic Sciences Pathology Senior Selective. 0.5 Hours.
Semester course; 1.5 clinic hours. 0.5 credit. Clinic time may be weekly, in block rotation or variable schedule. Enrollment is restricted to students with D4 class status and who are selected to participate. Students must enroll in this course for two consecutive semesters. This selective will allow the student to experience a variety of activities in oral and maxillofacial pathology. Students will learn how a biopsy specimen is processed into a slide, how pathologists make diagnoses and how pathology is a critical component in multidisciplinary patient care. Students will be exposed to oral pathology as a career and will learn the process of running a lab. Students with interest in performing biopsies in practice and those interested in an oral surgery residency, oral medicine residency, oral pathology residency or a dental oncology fellowship will find this selective beneficial. Graded as Pass/Fail.

ORPT 732. Clinical Oral Pathology and Oral Medicine. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to provide students with the knowledge to recognize, diagnose and treat the common diseases/conditions found in dental practice. Graded as pass/fail.

ORPT 737. D3 Radiology Rotation. 1 Hour.
Yearlong course; 1 clinical hour. 1 credit. This two-semester progressive clinical science course prepares the predoctoral dental student to be a competent practitioner of oral and maxillofacial radiographic technique and diagnostic interpretation. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

ORPT 750. Advanced Oral Diagnostic Sciences. 0.5 Hours.
Semester course; 0.5 lecture hours. 0.5 credits. May be repeated for a maximum of 1 credit. Enrollment is restricted to students in the Master of Science in Dentistry program. This course provides advanced education in the fields of oral and maxillofacial pathology, oral and maxillofacial radiology, orofacial pain, and oral medicine. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for the spring semester.

Oral Surgery (ORSG)

ORSG 622. Introduction to Oral Surgery. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to introduce the second-year student to basic principles in oral surgery. The course prepares the student for entry into the oral surgery clinical rotation.

ORSG 700. Senior Selective in Oral and Maxillofacial Surgery. 1 Hour.
Semester course; 46 clinical and 4 didactic hours. 1 credit. Prerequisites: successful completion of ORSG 622, 731, 733, 739, D4 class standing and permission of the course director. This elective will allow a qualified student the opportunity to observe and/or participate in a variety of activities in oral and maxillofacial surgery that extend beyond the standard undergraduate curriculum.

ORSG 701. D4 Elective in Basic Concepts in Outpatient Anesthesia. 0.75 Hours.
Semester course; 0.5 lecture and .25 clinic hours. 0.75 credits. Students must enroll in this course for two consecutive semesters. This elective will allow a qualified student the opportunity to observe and/or participate in a variety of activities in outpatient anesthesia that extend beyond the standard D.D.S. curriculum. Graded as Pass/Fail.

ORSG 731. Management of the Medically Compromised Dental Patient and Medical Emergencies in the Dental Office. 2 Hours.
Semester course; 2 lecture hours (delivered hybrid). 2 credits. May be repeated for a maximum of 10 credits. Students develop an understanding of systemic and medical conditions which may influence the provision of dental care by a provider. The course is also aimed at enabling students to incorporate the importance of medical conditions which directly impact dental treatment planning. The course also prepares students to manage medical emergencies that may occur during the provision of dental care.

ORSG 733. Principles of Oral and Maxillofacial Surgery. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. A lecture series designed to provide a foundation of professional knowledge associated with the surgical skills to fully enable the student to diagnose, treat and, when necessary, refer oral and maxillofacial surgical problems encountered in general practice.

ORSG 739. Clinical Oral Surgery III. 2.5 Hours.
Yearlong course; 120 clinical hours. 2.5 credits. Entails clinical rotations through the OMS clinic. An entry-level clinical course designed to provide practical experience in basic oral surgery and observation of the more complex procedures performed by oral and maxillofacial surgeons. Students receive a grade of CO for fall, with a P/F grade and all credit hours earned in spring. Students receive a grade of CO for fall, with a P/F grade and all credit hours earned in spring.

ORSG 749. Clinical Oral Surgery IV. 2 Hours.
Yearlong course; 2 clinical hours (80 contact hours). 2 credits. Provides the senior dental student with rotation-based clinical experience in which they further refine and develop their skills in clinical oral surgery and medical assessment of the patient for surgery. Cases treated by the senior student in this rotation are generally more complex (medically and surgically) than those treated in ORSG 739. Course graded as CO in the first semester with P/F grade awarded upon completion of second semester.

Orthodontics (ORTH)

ORTH 532. Biomechanics: Theoretical Basis for Tooth Movement. 1 Hour.
Semester course; 15 lecture/seminar hours. 1 credit. Introduces physical science of mechanics and engineering statics as applied to orthodontic force systems. Emphasizes equilibrium and the biological manifestation of force systems applied to the dentition and craniofacial skeleton.

ORTH 620. Orthodontic Clinic for Non-orthodontic Graduate Students. 1 Hour.
Semester course; 30 clinical sessions. 1 credit. Must be taken every semester of the program. Allows residents to diagnose and treat limited orthodontic problems with special emphasis on the primary and mixed dentitions. Includes, but is not limited to, anterior and posterior crossbites, space and tooth loss, transient or definitive crowding and tooth irregularities, oral habits, ectopic and other tooth eruption problems.

ORTH 623. Orthodontics Lecture. 2 Hours.
Semester course; 2 lecture contact hours. 2 credits. An introduction to orthodontics meant to provide second-year dental students with a basic understanding of the diagnosis and treatment of orthodontic problems. The emphasis will be on understanding basic, universally applicable orthodontic concepts rather than on learning specific details relating to particular treatment mechanisms or appliances. This is consistent with current trends in the specialty, which recognize that orthodontic solutions are often attainable by many routes, with a common goal of maximizing the functional, esthetic and stable end result. There will be an overview of growth and development, emphasizing how favorable or unfavorable growth may influence orthodontic diagnosis and treatment. A detailed description of the development of occlusion will also be presented with an emphasis on recognizing and diagnosing abnormalities related to tooth eruption and craniofacial growth.

ORTH 650. Literature Review. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken every semester of the program. Reviews classical articles in areas of special orthodontic interest. Establishes the state-of-the-art and existing information base. Gives special attention to research methodology and conclusions reached.

ORTH 652. Growth and Development. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken every semester of the program. Discusses the increases in size and complexity that occur in the craniofacial region including variations in proportionality and related variations in facial form and dental occlusion. Provides special emphasis on compensations in skeletal and soft tissue structures. Examines the basis for prediction of change.

ORTH 654. Orthodontic Diagnosis and Treatment Planning. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken every semester of the program. Considers and discusses available and theoretical options for clinical management of variations in facial form and dental occlusion.

ORTH 656. Current Literature. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken every semester of the program. Presents in a journal-club-format evaluation of current information in orthodontics and related disciplines. Includes special emphasis on research methodology and the contributions of current research to advances in orthodontics.

ORTH 658. Analysis of Orthodontic Treatment. 1.5 Hour.
Semester course; 22.5 seminar hours. 1.5 credits. Must be taken every semester of the program. Analyzes cephalometric and other objective measures of the outcomes of orthodontic therapy. Reviews treatment objectives with respect to actual changes effected in patients. Delineates changes resulting from therapy from normal variations in craniofacial development.

ORTH 660. Orthognathic Conference. 1 Hour.
Semester course; 15 seminar hours. 1 credit. Must be taken every semester of the program. Presents patients requiring coordinated orthodontic and oral surgery care. Emphasizes long- and short-term biologic stability of alterations in the structure and function of the craniofacial skeleton with increased emphasis on facial form and dental occlusion.

ORTH 662. Craniofacial Anomalies. 1 Hour.
Semester course; 15 lecture/seminar hours. 1 credit. Must be taken every semester of the program. Discusses the etiology and embryologic basis of congenital and acquired deformities in the craniofacial structures. Emphasizes syndromes with craniofacial manifestations and the diagnosis and treatment planning for patients with facial clefts.

ORTH 680. Orthodontic Clinic. 1-12 Hours.
Semester course; 1-12 clinic hours (three hours per credit). 1-12 credits. Enrollment is restricted to students enrolled in the M.S.D. program. Students will learn the clinical management of orthodontic patients. Involves supervised experiences in treatment of a complete spectrum of normally occurring orthodontic problems in an environment simulating private practice. Must be taken both fall and spring of the first and second years of the program for a total of 10 credits. May be taken without credit in additional semesters as needed to complete clinical training. Graded as pass/fail.

ORTH 700. Senior Selective in Orthodontics. 2 Hours.
Semester course; 1 seminar and 1 clinic hour. 2 credits. Prerequisites: ORTH 623, ORTH 733, and ORTH 739. Enrollment requires permission of the course director. Students must enroll in this course for two consecutive semesters. A clinical and didactic course designed for students who wish to gain advanced knowledge of orthodontics in an environment simulating a practice setting. The course will include participation in seminars, clinical activities and hospital rotations for craniofacial patients. The course will provide an excellent preparation for students entering the private practice of dentistry or students seeking graduate education in the field of orthodontics. A maximum of four students will be chosen to participate in this selective each year. Graded as pass/fail.

ORTH 733. Orthodontic Therapy. 1 Hour.
Semester course; 1 lecture contact hour. 1 credit. Consists of didactic lectures, a continuation of ORTH 623.

ORTH 739. Clinical Orthodontics III. 1 Hour.
Yearlong course; 2.5 hour clinic sessions. 1 credit. The purpose of this clinical course is to give the student practical, hands#on, orthodontic diagnosis and treatment experience to supplement the didactic material learned in preclinical orthodontic courses. The student will learn how to diagnose orthodontic problems so that normal developmental processes, minor occlusal discrepancies with simple solutions and more complex problems requiring referral to a specialist may be differentiated. Diagnosis and treatment of cases requiring limited orthodontic therapy will be the focus of the course during the junior year when students will rotate through the orthodontic clinic in eight-week block rotations. Students receive CO grading in the fall and pass/fail grade and credit are awarded in spring.

Pediatric Dentistry (PEDD)

PEDD 511. General Anesthesia Rotation. 3 Hours.
Semester course; 40 clinical sessions. 3 credits. Teaches general anesthesia with special emphasis in pediatrics. Allows students to become knowledgeable in pre-operative evaluation, risk assessment, assessing the effects of pharmacologic agents, venipuncture techniques, airway management, general anesthetic induction and intubation, administration of anesthetic agents, patient monitoring, prevention and management of anesthetic emergencies, recovery room management, postoperative appraisal and follow-up.

PEDD 512. Growth and Development. 1 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. Lecture format provides foundational knowledge on the growth and development of the head and neck to include oral embryology and development of the dentition.

PEDD 514. Introduction to Pediatric Dentistry. 2 Hours.
Semester course; 30 lecture hours. 2 credits. Introduces material in pediatric dentistry. Involves didactic, clinical and laboratory portions.

PEDD 572. Pediatric Dental Emergency Service. 2.5 Hours.
Semester course; 30 clinical sessions. 2.5 credits. Must be taken for two consecutive semesters. Graduate students are scheduled for emergency services on a weekly basis. Offers experience in the assessment and management of orofacial trauma, dental pain and infections.

PEDD 612. Seminar Series: Pediatric Dentistry and Medicine. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken every semester of the program. Provides an arena for students to present seminars in either a clinical area or medical conditions of interest to pediatric dentists. Gives students practical experience in giving formal presentations and provides him/her with information related to clinical subject area(s) with medical conditions about which pediatric dentists should be knowledgeable.

PEDD 620. Pediatric Medicine Rotation. 1.5 Hour.
Semester course; 40 clinical sessions. 1.5 credits. Requires students to obtain and evaluate medical histories, parental interviews, system-oriented physical examinations, clinical assessments of healthy and ill patients, selection of laboratory tests and evaluation of data, evaluation of physical, motor and sensory development, genetic implications of childhood diseases, the use of drug therapy in the management of diseases and parental management through discussions and explanations.

PEDD 622. Introduction to Pediatric Dentistry. 2.5 Hours.
Semester course; 2 lecture and 0.5 laboratory hours. 2.5 credits. Designed to develop the student's knowledge of diagnosis, treatment planning and basic skills for management of the pediatric dental patient. The course is the first of two didactic courses given to the dental student for pediatric dentistry. The course also includes lab sessions for hands on skill development.

PEDD 640. Clinical Teaching. 2 Hours.
Semester course; 25 clinical sessions. 2 credits. May be repeated for credit. Must be taken every semester of the program. Lectures and clinical instruction involving contact with third and forth-year dental students. Provides teaching experience in diagnosis and treatment planning, restorative preparations and management of children's behavior.

PEDD 650. Literature Review. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken every semester of the program. Reviews literature related to all aspects of the pediatric patient. Emphasizes the ability students to discuss the content of the articles and to critically evaluate it. Stresses the integration of new material with previously discussed literature and collateral material. Uses the reading list from the American Board of Pediatric Dentistry.

PEDD 654. Treatment Planning Seminar. 1 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. May be repeated for a total of four credits. Must be taken every semester of the program. Provides diagnosis and treatment planning of the child, adolescent and special patient. Follows up on records on completed cases, which also are presented and evaluated. Discusses the techniques employed and the justification of the treatment.

PEDD 656. Current Literature Review. 1 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. May be repeated for credit. Discusses articles from recent publications relating to all aspects of pediatric dentistry. Covers and critically reviews the Policies and Guidelines of the American Academy of Pediatric Dentistry.

PEDD 680. Pediatric Dental Clinic. 1-12 Hours.
Semester course; 3-36 clinic hours. 1-12 credits. May be repeated for a maximum of 16 credits. Clinical training credit will vary based on circumstances. Provides for the clinical management of pediatric dental patients. Provides experiences in the treatment of infants, preschool children, adolescent and special patients. Stresses pharmacological and non-pharmacological techniques and behavior management. Graded as pass/fail.

PEDD 700. Senior Selective in Pediatric Dentistry. 1 Hour.
Semester course; 4 clinical hours per week. 1 credit. Prerequisites: successful completion of PEDD 611 and PEDD 733 and permission of the course director. This is a clinical course that provides students with more advanced experiences and techniques in pediatric dentistry.

PEDD 701. Selective in Special Care Dentistry. 1 Hour.
Semester course; 4 clinical hours/week. 1 credit. Prerequisites: D4 standing and selection by course faculty. This course is designed to give the interested student clinical exposure to the comprehensive dental care of individuals who have special health care needs. Graded as pass/fail.

PEDD 730. Special Care Dentistry. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to dental students with D3 standing. This course is designed to enhance the dental student's understanding of the complexities of providing care for individuals with special health care needs.

PEDD 733. Advanced Pediatric Dentistry. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to supplement and reinforce the student's knowledge of diagnosis, treatment planning and basic skills for management of the pediatric dental patient. This includes a review of basic pediatric clinical procedures and introduction to the treatment of pediatric patients with special needs.

PEDD 739. Clinical Pediatric Dentistry III. 0.5 Hours.
Yearlong course; 24 clinical hours. .5 credit. Clinical rotation course designed to introduce the student to the basics of clinical pediatric dentistry and to prepare the student for PEDD 749. Students receive CO grading in the fall and a letter grade upon completion.

PEDD 749. Clinical Pediatric Dentistry IV. 1 Hour.
Semester course; 48 clinical hours. 1 credit. Enrollment is restricted to students who have successfully completed all prior courses in pediatric dentistry and D4 class standing. This course is offered as a two-week clinical rotation during the senior year of the dental curriculum. Students will build upon and refine the skills developed during the D3 clinical experience. Pediatric dentistry is a unique experience because of the young patient population and psychological skills are centrally important to delivering patient care. The course has a strong emphasis on developing behavioral, communication and patient-management skills.

Periodontics (PERI)

PERI 508. Physical Diagnosis. 2 Hours.
Semester course; 30 lecture hours. 2 credits. Provides lectures and hands on experience in physical diagnosis, history taking, general physical examination and review of major organ systems.

PERI 511. Anesthesiology Rotation. 1.5 Hour.
Semester course; 45 clinical sessions. 1.5 credits. Provides students with experience in general anesthesia under the direction of the dental anesthesiologist. Emphasizes operating room procedures, airway management, intravenous technique, anesthetics and resuscitative procedures. Includes clinical management of conscious sedation cases.

PERI 512. Conscious Sedation. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Reviews concepts of parental conscious sedation techniques to include anatomy and physiology of the respiratory, cardiovascular and central nervous system, drug pharmacology, intravenous technique, prevention, recognition and management of complications, management of emergencies, physiologic monitoring and equipment, basic life support and advanced cardiac life support.

PERI 514. Introduction to Periodontics. 3 Hours.
Semester course; 48 lecture/seminar hours. 3 credits. Provides students with an introduction to the clinical practice of periodontics. Emphasizes diagnosis, etiology, prognosis, treatment planning, initial therapy, therapeutic approaches, suturing techniques, oral hygiene and dental photography.

PERI 515. Internal Medicine Rotation. 1.5 Hour.
Semester course; 45 clinic sessions. 1.5 credits. Provides students with experience in internal medicine under the direct supervision of the Department of Internal Medicine. Emphasizes hospital procedures and management of the medically-compromised patient.

PERI 520. Principles of Periodontics. 1.5 Hour.
Semester course; 20 lecture/seminar hours. 1.5 credits. May be repeated for a maximum of four credits. Must be taken for two consecutive semesters. Reviews the principles of the basic science of periodontology, including anatomy of the periodontium, classification, etiology, diagnosis, scaling and root planning, and treatment planning. Reviews the indications and contraindications for management of complex periodontal problems. Reviews the principles of non-surgical and surgical techniques.

PERI 525. Diagnosis of Periodontal Diseases. 1 Hour.
The first in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will develop a fundamental understanding of how to assess patients for periodontal disease and how to develop a specific diagnosis. Enrollment is restricted to admitted dental students.

PERI 526. Etiology and Pathogenesis of Periodontal Diseases. 1.5 Hour.
1.5 credits. The second in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will build upon their knowledge of diagnosis and develop their understanding of the causes, mechanisms and development of periodontal disease. Enrollment is restricted to admitted dental students.

PERI 552. Implantology. 1,2 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. Covers the historical review of dental implants, including biologic principles, techniques and systems; diagnosis, interdisciplinary considerations, treatment planning and indications and contraindications for implants; wound healing for implants, including osseointegration, surgical techniques and implant maintenance. Provides a hands-on technique laboratory.

PERI 619. Clinical Pathology Rotation. 0.5 Hours.
Semester course; 21 clinic sessions. 0.5 credit. Provides instruction in patient assessment, biopsy technique, assessment of tissue preparations and review of oral histologic slide materials.

PERI 627. Non-Surgical Periodontal Therapy. 1.5 Hour.
The third in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will add to their skill set a conceptual knowledge of non-surgical treatment options for periodontal disease. Enrollment is restricted to admitted dental students.

PERI 630. Medicine: Oral Medicine Seminar. 1.5 Hour.
Semester course; 26 seminar hours. 1.5 credits May be repeated for credit. Must be taken every semester of the program. Emphasizes diagnosis, pathogenesis, oral manifestations and management of systemic diseases. Reviews the management of the medically-compromised patient, including laboratory procedures, pharmacology, hematology and reviews of the cardiovascular, respiratory, endocrine and neurologic systems. Discusses and critically evaluates medical and oral medicine topics relative to management of the periodontal patient.

PERI 650. Periodontal Literature Review. 3 Hours.
Semester course; 48 seminar hours. 3 credits. Must be taken every semester of the program. Reviews the periodontal literature from early classic articles to current publications pertaining to the scientific basis for periodontal procedures. Reviews the concepts of diagnosis, etiology, epidemiology, pathogenesis, therapy, maintenance of periodontal diseases and implantology. Discusses content of the literature by means of abstracts and study questions.

PERI 654. Treatment Plan: Case Presentations. 1 Hour.
Semester course; 12 seminar hours. 1 credit. Must be taken every semester of the program. Emphasizes the interpretation the medical and dental histories, radiographic and clinical findings, diagnosis, etiology, prognosis, treatment planning, therapy and supportive periodontal care. Discusses the content of reviewed cases by written and oral presentations. Requires the student to assimilate and interpret clinical findings.

PERI 656. Current Literature Review. 3 Hours.
Semester course; 36 seminar hours. 3 credits. May be repeated for credit. Must be taken every semester of the program. Provides an in-depth review of contemporary periodontal literature. Discusses content of the reviewed literature by means of abstracts and discussion.

PERI 680. Clinical Periodontics. 0.5-12 Hours.
Semester course; 1.5-36 clinic hours. 0.5-12 credits. Enrollment is restricted to students in the M.S.D. program. Provides supervised training in periodontics. Provides the student with the experience in the treatment and management of patients with various types and severities of periodontal diseases. Emphasizes diagnosis, treatment planning, prognosis, scaling and root planing, non-surgical and surgical techniques. Provides experience in the treatment of advanced periodontal cases and more complex surgical techniques including preprosthetic, orthodontic, periodontal plastic and mucogingival procedures, guided tissue regeneration, guided bone regeneration and implant surgical techniques. Must be taken for seven credits in the fall and 8.5 credits in the spring of the third year of the program for a total of 15.5 credits. May be taken for additional semesters as needed to complete clinical training, but additional credits will not apply towards degree completion. Graded as P/F.

PERI 700. Advanced Periodontal Selective. 0.75 Hours.
Semester course; 0.25 lecture and 0.5 clinic hours. 0.75 credits. This course is offered to dental students who demonstrate high academic achievement and are interested in expanding their practical knowledge and experience in periodontal surgical procedures. It is designed to enhance the general dentist's knowledge regarding indications, diagnosis and treatment planning of periodontal surgical procedures and to provide hands-on experience in applying techniques of surgical periodontal procedures suitable for judicious use in general dental practice. Graded as pass/fail.

PERI 719. Specialty Practice Management. 0.5 Hours.
Semester course; 22 seminar hours. 0.5 credit. Must be taken for two consecutive semesters. Provides the student with experience in office management. Requires visits to specialty offices to familiarize the student with contemporary modes of practice administration and patient management.

PERI 733. Surgical Periodontal Therapy. 1 Hour.
1 credit. The fourth in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will complete their didactic exploration of periodontal diseases with a conceptual knowledge of surgical treatment options for periodontal diseases. Enrollment is restricted to admitted dental students.

PERI 739. Clinical Periodontics III. 5 Hours.
Yearlong course; clinical contact hours. 5 credits. The primary objective of the department is to provide an educational experience that will enable the dental student to meet the periodontal needs of present and future patients. These objectives necessitate student awareness of the biology of the periodontium and pathology of gingival and periodontal diseases; the ability to examine, diagnose and develop a treatment plan for the patient with significant periodontal disease; and an understanding of the implications of periodontal diagnosis and treatment on the oral and general health of the patient. The student should also be competent in plaque control, scaling, root planing and other procedures ordinarily included in presurgical phases of therapy. The student should be familiar with the entire scope of periodontal therapy, understanding the rationale and indications for surgical treatment and anticipated results.

PERI 749. Clinical Periodontics IV. 1 Hour.
Yearlong course; 1 clinic session per week. 1 credit. This final clinical course in periodontics provides competency assessment of the dental student as an entry-level dentist in the diagnosis and management of patients with periodontal diseases. Students receive CO grading in the fall and a pass or fail grade and earned credit in the spring.

PERI 780. Advanced Assessment and Management of Periodontal Diseases. 4 Hours.
Semester course; 4 seminar and 2 clinic hours. 4 credits. May be repeated. Designed to present periodontal literature from early classic articles to current publications pertaining to the scientific basis of periodontal diagnosis, etiology, epidemiology, pathogenesis, prognosis, and indications for and expected outcomes of periodontal therapies. Emphasis is placed on the interpretation of medical and dental histories, radiographic and clinical findings, prognosis, treatment planning, and nonsurgical and surgical techniques utilized for the management of periodontal diseases. Graded as Pass/Fail.

PERI 781. Advanced Dental Implantology. 3 Hours.
Semester course; 4 seminar and 1 clinic hours. 3 credits. May be repeated. This course is designed to present the literature from early classic articles to current publications pertaining to the scientific basis of dental implants, including simple to complex site preparation. Emphasis is placed on patient assessment, diagnosis, interdisciplinary considerations, treatment planning, surgical techniques, wound healing and osseointegration, and implant maintenance. Graded as Pass/Fail.

PERI 782. Research in Periodontics. 7 Hours.
Semester course; 2 lecture and 5 laboratory hours. 7 credits. This course is designed to provide an introduction to research study design, use of biostatistical methods, critical appraisal of published articles and writing of scientific manuscripts. Emphasis is placed on identifying research questions, conducting literature reviews, developing research protocols, collecting and analyzing data, and presenting research findings. Includes practical experience conducting a research project. Graded as Pass/Fail.

PERI 783. Advanced Research in Periodontics. 1-10 Hours.
Semester course; 0-10 laboratory hours. 0-10 credits. May be repeated for the duration of a research project. This course is designed to emphasize identifying research questions, conducting literature reviews, developing research protocols, collecting and analyzing data, and presenting research findings. Includes practical experience conducting a research project. Graded as Pass/Fail.

Prosthodontics (PROS)

PROS 500. Advanced Biomaterials in Prosthodontics. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Enrollment is restricted to students in the prosthodontic concentration of the Master of Science in Dentistry program. The course is a seminar course that will provide basic material science and clinical applications of contemporary biomaterials used in prosthodontic therapy. The course will include physical properties of non-elastomeric and elastomeric materials, polymethylmethacrylate and related polymers, composite resins and other operative materials, cements and luting materials, metal alloys in dentistry, materials used in CAD/CAM dentistry, dental implant materials, as well as current literature in prosthodontic biomaterial research. Graded as pass/fail.

PROS 501. Diagnosis, Treatment Planning and Case Presentation Seminar. 2 Hours.
Semester course; 2 seminar hours. 2 credits. May be repeated for a maximum of 12 credits. Enrollment is restricted to students in the prosthodontic concentration of the Master of Science in Dentistry program. The course is a one semester seminar course that is taken on a recurring basis throughout the three years of prosthodontic residency training. Residents will present their case to their classmates and faculty. The case presentation will include pre-operative conditions, diagnosis and treatment planning process using evidence-based principles for cases in the treatment planning phase. In addition, treatment sequences as well as prognosis and post-treatment assessment will be added to the presentations for cases with completed treatments. Mainly, first year resident presentations will be on diagnosis and treatment planning while for second and third year residents it will be a mix of treatment planning as well as presenting completed cases. Graded as pass/fail.

PROS 502. Digital Technology Prosthodontics. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Must be taken for two consecutive semesters. Enrollment is restricted to students in the prosthodontic concentration of the M.S.D. program. Students will learn the clinical and laboratory principles of digital technology in prosthodontics. The seminar will cover the overview of digital applications in dentistry, intraoral scanners, digital prosthodontic software designs and virtual articulators, principle and practice of CAD/CAM dentistry, 3D printing/additive manufacturing, digital dentistry in fixed prosthodontics, digital dentistry in removable partial denture therapy, and digital complete dentures. This course will present the overall use of digital technology and its clinical and laboratory applications. Graded as pass/fail.

PROS 503. Fundamentals of Prosthodontics. 7 Hours.
Semester course; 7 seminar/laboratory hours. 7 credits. Enrollment is restricted to students in the prosthodontic concentration of the Master of Science in Dentistry program. The course is a one semester seminar course that is taken by the first-year residents at the beginning of the program. The aim of this course is to go over an in-depth-review of the fundamentals of prosthodontics in fixed, removable, and implant dentistry from didactics to laboratory/clinical aspects as well as detailed diagnosis and treatment planning procedures for different case scenarios and a focus on digital workflows. During this course there will be orientation to the program where the program director goes over the graduate programs' handbook. Graded as pass/fail.

PROS 600. Advanced Prosthodontics Literature Review. 1 Hour.
Semester course; 1 seminar hour. 1 credit. May be repeated for a maximum of six credits. Enrollment is restricted to students in the prosthodontic concentration of the Master of Science in Dentistry program. The course is a seminar course in advanced applications of prosthodontic therapy including principle of full mouth rehabilitation, diagnosis and treatment for temporomandibular disorders and orofacial pain, occlusion, digital dentistry, and evidence-based prosthodontic therapy in fixed, removable and dental implants related topics. This course will emphasize the clinical applications of advanced clinical prosthodontics. Graded as pass/fail.

PROS 601. Surgical and Prosthodontic Principles of Implant Therapy. 1 Hour.
Semester course; 1 seminar hour. 1 credit. May be repeated for a maximum of two credits. Enrollment is restricted to students in the prosthodontic concentration of the Master of Science in Dentistry program. The course is a seminar course that will provide the surgical and prosthodontic principles of implant therapy. The seminar will include wound healing, infection control, anatomy and physiology related to prosthodontic and implant therapy, diagnostic imaging and cone-beam computed tomography technology, diagnosis and treatment planning for implant therapy, common hard and soft tissue augmentation procedures in implant dentistry, guided implant surgery, and management of complications in implant dentistry. Graded as pass/fail.

PROS 624. Preclinical Removable Prosthodontics. 2 Hours.
Yearlong course; 2 lecture hours. 2 credits. An introductory course in removable prosthodontics, including complete dentures and removable partial dentures. Presents the basic information, which is prerequisite for understanding the laboratory procedures and the diagnosis and treatment planning of patients requiring CDs and RPDs. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

PROS 625. Preclinical Removable Prosthodontics Lab. 4 Hours.
Yearlong course; 4 laboratory hours. 4 credits. An introductory course in removable prosthodontics, including complete dentures and removable partial dentures. Presents the basic information, which is prerequisite for understanding the laboratory procedures and the diagnosis and treatment planning of patients requiring CDs and RPDs. This laboratory course provides hands-on skill development of these procedures. Graded CO in fall with a letter grade and credit awarded in spring.

PROS 626. Clinical Principles of Dental Implantology Lecture. 1 Hour.
Semester course. 1 credit. Enrollment restricted to admitted dental students. Offered in tandem with a laboratory course and providing didactic information on the same topic, this course is a preclinical experience for predoctoral students, designed to introduce necessary clinical skills for dental implantology.

PROS 628. Clinical Principles of Implantology Lab. 1 Hour.
Semester course; 48 lab contact hours. 1credit. Enrollment restricted to admitted dental students. Offered in tandem with a lecture course and providing didactic information on the same topic, this course is a preclinical laboratory experience for predoctoral students, designed to introduce necessary clinical skills for dental implantology. Simulated activities include diagnosis and treatment planning, fabrication of a surgical guide, implant surgery, implant prosthodontic impression making, master cast fabrication, implant crown provisionalization, and implant overdenture treatment skills. Students will see demonstrations of cone-beam CT scan technology, computer-based software for implant surgical treatment planning and computer-based CAD-CAM design for custom implant abutments.

PROS 630. Principles of Maxillofacial Prosthetics. 0.5 Hours.
Semester course; 0.5 lecture hours. 0.5 credits. Enrollment is restricted to students admitted to the Master of Science in Dentistry program. This course is designed as a lecture-seminar for advanced prosthodontic residents, aiming to familiarize them with advanced interdisciplinary care for patients with developmental or acquired oral-maxillofacial defects, including those resulting from radiation and requiring pre-radiation and pre-resection dental examinations and treatments. Through this course, residents will gain expertise in the interdisciplinary treatment procedures involving chemotherapy, radiation therapy and jaw reconstruction, specifically focusing on providing prosthetic rehabilitations like maxillary obturators, mandibular resection appliances, speech appliances and implant-assisted maxillofacial prostheses. Graded as pass/fail.

PROS 656. Literature Review in Prosthodontics. 1 Hour.
Semester course; 1 seminar hour. 1 credit. May be repeated for credit. Enrollment is restricted to students in the prosthodontic concentration of the M.S.D. program. Residents will present the classic and current literature on a rotation basis through topics in fixed prosthodontics, removable prosthodontics, implants and implant therapy, occlusion, esthetics, biomaterials, digital technology, prosthodontic diagnosis and treatment planning, temporomandibular disorders and orofacial pain, pre-prosthetic surgery, geriatric considerations in prosthodontic care, and maxillofacial prosthetics. The course will train students to use the principles of evidence-based dentistry to evaluate classic and current literature as well as create a culture of self-learning and lifelong learning. Graded as pass/fail.

PROS 680. Clinical Prosthodontics. 1-12 Hours.
Semester course; 3-36 clinic hours. 1-12 credits. May be repeated for a maximum of 32 credits. Enrollment is restricted to students in the Master of Science in Dentistry program. This course provides supervised experiences in advanced clinical skills. Students will enhance their skills in diagnosis and treatment planning, patient communication, professional and ethical care, and collaboration with other healthcare providers. Sections of the course will address specialty specific treatments. May be taken without credit in additional semesters as needed to complete clinical training. Graded as pass/fail.

PROS 700. Senior Selective in Advanced Clinical Prosthodontics. 2 Hours.
Semester course; 1 lecture and 3 clinical hours. 2 credits. Students must enroll in this course for two consecutive semesters. It is designed to develop advanced skills in treating prosthodontic cases beyond the level of basic clinical competency required for graduation. Graded as Pass/Fail.

PROS 731. Complete Denture Prosthodontics. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Designed to present the current concepts, principles and diagnostic techniques required to diagnose, treatment plan and predict the outcome of the treatment of edentulous patients and patients requiring a single denture against natural teeth. Acceptable clinical procedures are presented for the management of patients that fall into the above categories. Correlation of basic and clinical science is emphasized, as well as the prosthodontic ramifications of the mechanical and behavioral sciences.

PROS 735. Removable Prosthodontics Diagnosis and Treatment. 1.5 Hour.
Semester course; 1.5 lecture contact hours. 1.5 credits. Designed to prepare students to apply their preclinical removable prosthodontic knowledge and skill in the clinical setting. Focuses on the diagnosis and treatment planning aspects of clinical care.

PROS 739. Clinical Fixed Prosthodontics III. 2 Hours.
Yearlong course; 2 clinical hours. 2 credits. This course builds on preclinical laboratory skills developed in D1 and D2 years and applies them to fixed prosthodontic patient care in the clinical setting. Graded CO in the fall semester with a pass/fail grade and credit awarded in spring.

PROS 740. Clinical Removable Prosthodontics. 3.5 Hours.
Yearlong course; 3.5 clinical hours. 3.5 credits. Prerequisite: PROS 624. This course builds on technical skills developed in PROS 624 (D2 year) and applies them to patient care in the clinical setting. Graded CO in the fall semester with a pass/fail grade and credit awarded in spring.

PROS 749. Clinical Prosthodontics IV. 2 Hours.
Yearlong course; 2 clinic hours (one clinic session per week averaged over the year). 2 credits. This capstone course provides clinical experience in basic fundamental prosthodontic procedures, including diagnosis, management and treatment of patients in need of reconstructive fixed, removable or implant prosthodontic care. The course also includes both technical and competency assessment of the dental student's skills as an entry-level general dentist. Students receive CO grading in the fall and a pass/fail grade and earned credit in the spring.

School of Medicine

Graduate Medical Education (GMED)

GMED 600. Research for Residents and Fellows. 2 Hours.
Semester course; 2 contact hours. 2 credits. Prerequisites: second year of medical training or beyond, plus approval of residency/fellowship program director. Course restricted to physician trainees (M.D., M.B.B.S., D.O.). This course is designed to be an introduction to research for medical residents and fellows. Teamwork activities will focus on the application of concepts so that participants get "hands on" experience with topics discussed in class: formulating a research question, selecting a study design, choosing appropriate biostatistical analyses, designing a survey, writing an IRB proposal and understanding the responsible conduct of research and protection of human subjects. The class will culminate in a required final assignment in the form of a capstone project.

Medicine (MEDI)

MEDI 694. Pediatric Psychology Practicum. 1-3 Hours.
Semester course; one-half day per credit. 1-3 credits. Available only to graduate students in clinical or counseling psychology that are approved by the instructor. A series of training experiences designed to facilitate skill development in pediatric psychology and enhance effectiveness as a pediatric psychologist working within a medical setting. Trainees are given an opportunity to apply and practice diagnostic interviews, patient education, brief consultations and diagnostic and therapeutic skills with a pediatric population. Students will learn to effectively communicate and function as part of an interdisciplinary team in an academic medical setting. Careful supervision and evaluation of the student is provided.

MEDI 695. Independent Study in Health Psychology. 1-3 Hours.
Semester course; 1-3 contact hours. 1-3 credits. Approval from faculty member required. Provides the opportunity for students to explore a special topic of interest in the area of health psychology under the direction of a faculty member. A proposal for a topic of study and anticipated timeline for completion must be submitted to and approved by the faculty mentor; credits will be assigned commensurate with the complexity of the project. Arrangements are made directly with the appropriate faculty member. Graded as S/U/F.

School of Pharmacy

Medicinal Chemistry (MEDC)

MEDC 526. Research Techniques in Medicinal Chemistry. 1-4 Hours.
Semester course; 0-2 lecture and 2-8 laboratory hours. 1-4 credits. The theory and application of classical, instrumental, and computer techniques used in medicinal chemistry research are presented.

MEDC 527. Basic Pharmaceutical Principles for the Practicing Pharmacist. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines basic science principles in organic chemistry and biological chemistry as specifically related to the pharmaceutical treatment of disease.

MEDC 530. Bioinformatics and Genomics in Drug Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the basic elements of cellular pathways and drug interactions, and how modern genomics comes into play. Presents bioinformatics principles being used every day in data-intensive fields of research. Introductory and concept-oriented, the course will prepare students for grasping how bioinformatics is being used in many areas of biomedical sciences. Geared toward students coming from a variety of backgrounds in biology, biochemistry and chemistry. While many of the analytical approaches are statistical in nature, there is no requirement for a background in statistics or mathematics. Each student will have the opportunity to design a small project applying bioinformatics concepts. Crosslisted as: BNFO 530.

MEDC 532. Medicinal Chemistry for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A review of the principles of organic chemistry and bio-organic chemistry presented as a series of lectures covering the structure-activity relationships, metabolism, and mechanism of action of selected agents.

MEDC 533. Pharmacognosy. 1 Hour.
Semester course; 1 lecture hour. 1 credits. Introduces the basic concepts of crude drugs, semi-purified and purified natural products and the basics of the regulation of herbal products. Important types of natural products and their impact on the modern medical sciences, and the evaluation of alternative and complementary medicine purity and bioavailability will be discussed.

MEDC 541. Survey of Molecular Modeling Methods. 1 Hour.
Semester course; lecture and laboratory hour. 1 credit. Introduces computational chemistry and molecular graphics with the current software used for drug design and small molecule/large molecule interactions. Computational chemistry problems will be emphasized in the laboratory.

MEDC 542. Biotechnology-derived Therapeutic Agents. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides the fundamentals of biotechnology-derived biological agents including structure, manufacture, stability, analysis, formulation and usage. Selected examples of biological agents in current and future therapy may also be covered.

MEDC 551. Analytical and Physical Pharmaceutical Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to graduate students. The course presents fundamentals of physical and analytical chemistry as relevant to the pharmaceutical sciences. The overall goal is to prepare students for advanced specialized courses, work in the laboratory as well as future work in academia or industry. The course covers topics including thermodynamics, kinetics, quantum mechanics, spectroscopy, statistical thermodynamics, including principles behind instruments that analyze molecules and interactions. Secondly, the course instills an analytical approach to data and measurements by a survey of the analytical chemistry practice. Applications of the fundamentals to real life examples will be an important component of the course.

MEDC 552. Organic and Biochemical Pharmaceutical Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to graduate students. The course presents the fundamentals of synthetic organic chemistry, physical organic chemistry and biochemistry as relevant to the pharmaceutical sciences at the graduate level. The overall goal is to prepare students for advanced specialized courses, work in the laboratory, oral and written comprehensive exams in the graduate program and future work in academia or industry. The course covers organic chemistry topics including structure of small molecules, making and breaking bonds, reaction mechanisms, functional group structures, functional group interconversions and use of various analytical techniques as they relate the characterizing the product of synthetic chemistry transformations. Secondly, the course covers biochemistry topics including basic structure and function of biomolecules, post-translational modifications, metabolism, essential endogenous pathways and immunochemistry. Applications of the fundamentals to real life examples will be an important component of the course.

MEDC 553. Concepts in the Medicinal Chemistry of Therapeutics Agents. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Introduces topics in medicinal chemistry common to all drug classes, including structure activity relationships, principles of drug action, drug design and drug metabolism. Drugs acting on the autonomic nervous system are presented as a case study illustrating applications of the general principles.

MEDC 555. Fundamentals of Drug Discovery I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will work individually or in groups to learn the fundamentals of medicinal chemistry and drug discovery. The course utilizes formal lectures, informal group discussions, literature research and formal oral and/or written assignments to impart knowledge and practice of drug discovery. The course focus will be on molecular biology and pharmacological aspects of medicinal chemistry.

MEDC 556. Fundamentals of Drug Discovery II. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Students will work individually or in groups to learn the fundamentals of medicinal chemistry and drug discovery. The course utilizes formal lectures, informal group discussions, literature research and formal oral and/or written assignment to impart knowledge and practice of drug discovery. The course focus will be on methodologies and techniques of medicinal chemistry.

MEDC 591. Special Topics in Medicinal Chemistry. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. A course in which students may choose to participate in individual or group study in one or more areas of medicinal chemistry. The course can take the form of formal lectures, informal group discussions, literature research and/or laboratory research. Students must have the permission of the individual instructor before registering for this course.

MEDC 601. Advanced Medicinal Chemistry I. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. This course is designed to expose graduate students to the history and practice of medicinal chemistry with an emphasis on drug development, design, structure-activity relationship studies and their association with diseases to prepare students for future work in academia or industry.

MEDC 609. Advanced Organic Synthesis: A Target-oriented Approach. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. A study of chemical transformations in organic chemistry, their mechanisms and their application to the synthesis of complex target molecules.

MEDC 610. Advanced Medicinal Chemistry II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: MEDC 601 or permission of instructor. Introduces concepts for understanding the medicinal chemistry of the central nervous system.

MEDC 614. Research Techniques. 1-4 Hours.
Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: PCEU 614/PHAR 614.

MEDC 620. Advanced Medicinal Chemistry III. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: MEDC 601 or the permission of the instructor. Reviews the concepts necessary for enzyme inhibitor design. Emphasizes the design of new agents to treat disease states by enzyme inhibition.

MEDC 630. Theoretical Methods in Drug Design. 2 Hours.
Semester course; lecture and laboratory hours. 2 credits. Prerequisites: MEDC 601, MEDC 610 or MEDC 620, or permission of instructor. A study of the theoretical methods of drug structure-activity analysis, including molecular orbital theory, topological indexes and physical property correlations. Computational chemistry problems will be emphasized in the laboratory.

MEDC 642. Nucleoside, Nucleotide, Carbohydrate and Peptide Chemistry. 3 Hours.
Semester course; 1 lecture hour. 1 credit. Surveys nucleoside, nucleotide, carbohydrate and peptide chemistry with emphasis on their synthesis.

MEDC 643. Regioselective Drug Metabolism. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Surveys drug biotransformation reactions. Emphasizes the molecular aspects of Phase I and Phase II drug metabolism.

MEDC 644. Asymmetric Synthesis. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Reviews the major asymmetric chemical transformations, including mechanisms, scope and synthetic utility.

MEDC 645. Introduction to Heterocyclic Chemistry. 3 Hours.
Semester course; 1 lecture hour. 1 credit. Introduces the chemistry of heterocyclic compounds. Emphasizes heterocyclic nomenclature and the reactions/reactivity of heterocyclic systems.

MEDC 670. Advanced Molecular Modeling Theory and Practice. 3 Hours.
Semester course; 3 lecture/laboratory hours. 3 credits. Prerequisite: MEDC 641 or permission of instructor. Examines the principles and application of computational chemistry and molecular graphics to current problems in drug design. Lectures focus on the application of specific computational methods and techniques to solve problems in drug/molecular design. Workshop sessions provide hands-on experience using state-of-the-art hardware and software for molecular modeling.

MEDC 690. Departmental Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Reports presented by students, staff and visiting lecturers, current problems and developments in pharmaceutical and medicinal chemistry are discussed. Graded as PR in first semester of enrollment, with a letter grade assigned in the following semester.

MEDC 691. Special Topics in Medicinal Chemistry. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. Lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as a part of the research training.

MEDC 697. Directed Research in Medicinal Chemistry. 1-15 Hours.
Semester course; 1-15 research hours. 1-15 credits. May be repeated for a maximum of 30 credits. Research leading to the M.S. in Pharmaceutical Sciences or Ph.D. in Pharmaceutical Sciences. Graded as satisfactory/unsatisfactory.

Pharmaceutical Sciences (PSCI)

PSCI 607. Introduction to Pharmaceutical Sciences From Bench to Shelf. 2 Hours.
Yearlong course; 2 lecture hours. 2 credits. The purpose of this course is to familiarize students with the interdisciplinary nature of drug discovery and development, to acquaint them with where their research fits into the bigger drug discovery and development picture and to promote interdisciplinary discussions between the students and faculty. Current scientific, regulatory and health care trends impacting drug discovery, development and use will be discussed. Students will be introduced to current topics in the pharmaceutical sciences such as drug target selection, drug design, discovery and development, the drug approval process and regulatory sciences, product optimization, production, and marketing. Graded as CO in the fall semester with a letter grade and credits awarded in the spring.

PSCI 610. Frontiers of Pharmaceutical Research. 1-2 Hours.
Semester course; 1-2 lecture hours (delivered hybrid). 1-2 credits. May be repeated for a maximum of eight credits. A student-centered training course of scientific presentation and discussion for students using frontier research in pharmaceutical sciences. Students will present research data and/or literature and lead discussions among peer graduate students and faculty. Faculty may take a leading role in some of the classes. Students will also actively participate in small-group discussions led by peer graduate students and faculty.

PSCI 614. Research Techniques. 1-4 Hours.
Semester course; 1-4 lecture and/or 2-8 laboratory hours (delivered hybrid). 1-4 credits. May be repeated for a maximum of four credits. The course provides new graduate students with the skill set necessary to perform research in their discipline within pharmaceutical sciences. The course will use a combination of lectures, assignments, one-on-one training, laboratory and/or group discussion.

PSCI 690. Seminars in the Pharmaceutical Sciences. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Enrollment is restricted to graduate students in the pharmaceutical sciences programs. The goal for the seminar series is to provide students an opportunity for self-learning. The course will familiarize students with topics of current research interest within the pharmaceutical sciences and related biological sciences, as well as expose students to nationally and internationally renowned scientists.

PSCI 691. Special Topics in Pharmaceutical Sciences I. 0.5-5 Hours.
Semester course. 0.5-5 lecture hours. 0.5-5 credits. Subject matter is presented by lecture, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training. Graded S/U/F.

PSCI 692. Special Topics in Pharmaceutical Sciences II. 0.5-5 Hours.
Semester course; 0.5-5 lecture hours. 0.5-5 credits. Subject matter is presented by lecture, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training.

PSCI 701. Post-candidacy Doctoral Research. 9 Hours.
Semester course; 9 research hours. 9 credits. May be repeated for credit. Enrollment is restricted to graduate research assistants or graduate teaching assistants who have been admitted to doctoral candidacy in the School of Pharmacy. Students will participate in supervised discipline-specific research related to their dissertation topic. Students must have approval from their current degree program coordinator to register. This course can be approved as a substitution for any post-candidacy degree requirement (e.g. directed research). Graded as satisfactory/unsatisfactory.

Pharmaceutics (PCEU)

PCEU 507. Pharmaceutics and Biopharmaceutics I. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. Designed to describe the physico-chemical and biopharmaceutical principles fundamental to the development of pharmaceutical dosage forms. Topics will include solid-, semi-solid and liquid-dosage forms that include solid-state, semi-solid and liquid properties in addition to topics that span these dosage forms including aerosols, drug degradation and stability, shelf-life, packaging, and control of pharmaceutical ingredients.

PCEU 508. Pharmacokinetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PCEU 507. Corequisite: PCEU 509. Major topics include the mathematical and physiological principles of pharmacokinetics related to the development and use of pharmaceutical dosage forms. Discussions will include compartmental modeling, physiological concepts of pharmacokinetics, and clearance and absorption concepts. Also includes material related to statistics.

PCEU 509. Pharmaceutics and Biopharmaceutics II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PCEU 507. Designed to describe the biopharmaceutical principles fundamental to the development of pharmaceutical dosage forms, including parenteral products, solutions, disperse systems, semisolids, solids and novel drug delivery systems. The formulation, manufacture, control, biopharmaceutics and relevant patient-pharmacist interactions of the major dosage forms will be addressed and presented by route of administration.

PCEU 601. Applied Pharmacokinetics and Pharmacogenomics. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. Extends the concepts of pharmacokinetics as applied to physiological interpretation of pharmacokinetic properties and parameters, optimal dosage regimen design, pharmacokinetic variability in drug response, and drug interactions. Pharmacodynamic and pharmacogenomic principles include interpretation of genetic information and application to information in therapeutic decision-making.

PCEU 604. Molecular Pharmaceutics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of course coordinator. The student's basic biochemistry and pharmacy education will be expanded with emerging molecular concepts in enzyme and transporter structure and function, roles in drug disposition, pharmacogenomics, biochemistry, molecular biology, and experimental techniques.

PCEU 612. Advanced Physical Pharmacy and Biopharmaceutics. 3-5 Hours.
Semester course; 3 credits. Phase equilibria and phase transfer kinetics related to biopharmaceutics will be covered. The relationship between physiochemical properties of a drug dosage form and drug absorption, along with the correlation between in vitro tests used to evaluate dosage forms an in vitro measures of drug absorption will be covered. The course assumes that the student has a basic understanding of pharmacokinetics, physical chemistry and statistics.

PCEU 614. Research Techniques. 1-4 Hours.
Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: MEDC 614/PHAR 614.

PCEU 615. Applied Pharmacokinetics. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. Extends the concepts of pharmacokinetics as applied to dosage regimen design, pharmacokinetic variability, drug interactions and statistical strategies for individualization of drug therapy. Lectures and conferences take place throughout the semester.

PCEU 621. Advanced Pharmaceutics and Drug Disposition. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study at the advanced level of the relationships between the physiochemical properties of a drug and dosage form and the absorption, distribution, elimination and pharmacological effects of the drug. Current theory and methodology involved in solving problems at the research level are emphasized.

PCEU 622. Clinical Pharmacokinetics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. The application of current pharmacokinetic theory to clinical problems involved in optimizing and monitoring drug use in patients. Particular attention is given to adjustment of drug dosage in individual patients with impaired drug elimination due to renal and hepatic dysfunction. (Nontraditional program).

PCEU 624. Advanced Pharmacokinetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An advanced treatment of the kinetics of drug absorption, distribution, and elimination utilizing mathematical models, and digital computers for analysis of linear and nonlinear biologic systems.

PCEU 625. Pharmaceutical Analysis. 4 Hours.
Semester course; 3 lecture and 1 laboratory hours. 4 credits. Theory and practice of selected analytical techniques for the quantitative analysis of drugs in body fluids and other matrices. Emphasis is on method validation, and immunoassay methodologies. Laboratory sessions will provide "hands on" experience with modern methods of drug analysis.

PCEU 626. Pharmaceutical Analysis Laboratory. 1 Hour.
1 lecture hour. 1 credit. Prerequisite: PHAR 625. A continuation of PHAR 625 with emphasis on providing advanced topics for analysis of drugs and metabolites.

PCEU 675. Proteomics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to graduate students, but senior-level undergraduate students in STEM majors will be considered on an individual basis. Introductory course in proteomics with an emphasis on mass spectrometry-based measurements including protein identification, quantification and post-translational modifications. The course will cover essential mass spectrometry instrumentation and separation science fundamentals, sample preparation, protein identification, protein quantification, post-translational modification enrichment strategies, and data analysis. Contemporary applications of proteomics in biology and biomedicine will be covered.

PCEU 690. Pharmaceutics Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Required of all graduate students in pharmaceutics. Research Seminar.

PCEU 691. Special Topics in Pharmaceutics. 1-5 Hours.
Semester course; 1-5 lecture hours. 1-5 credits. Presentation of subject matter is by lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as part of the training in research.

PCEU 697. Directed Research in Pharmaceutics. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S., Pharm.D., or Ph.D. degree.

Pharmacy (PHAR)

PHAR 501. Pharmaceutical Calculations. 1 Hour.
Semester course; 1 lecture hour (delivered online). 1 credit. This course is designed in a student-centered learning format that supports self-directed learning. The course will help students develop the skill set needed to screen out the distractors from the determinant variables in a statement problem and guide their thought processes in sequential use of information to solve calculation problems seen in pharmacy practice.

PHAR 502. Introduction to Pharmacoeconomics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. The goal of the course is two-fold: 1) introduce students to the terms and processes of pharmacoeconomics and 2) inform students about the intersection between careers in health economics and pharmacy. Lecture, discussion and class assignments.

PHAR 503. Ethics and Equity. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Enrollment is restricted to Pharm.D. students. This course is intended to help students recognize and address ethical dilemmas using a systematic approach. Students will be challenged to evaluate viable options for resolving ethical dilemmas with the needs of patients and other key stakeholders in mind. The intersection of bioethics, health equity and health disparities will be explored. Students will be expected to demonstrate conceptual understanding, self-awareness and critical-thinking skills through a series of individual and small group assignments, including reflective exercises and case-based discussions.

PHAR 505. Pathophysiology and Patient Assessment Skills. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides an in-depth exploration of patient assessment techniques and the understanding of pathophysiology underlying various diseases and conditions. Students will develop the necessary skills to perform comprehensive health and medication assessments, interpret clinical findings and understand the underlying physiological processes necessary in patient-centered pharmacy practice. Topics covered include health and medication history-taking, basic physical assessment techniques, interpretation of common laboratory and other objective data, and common disease processes and their impact on different body systems. This course will also build on communication and information skills presented in concurrent courses.

PHAR 506. Nonprescription Medications and Self-care. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Enrollment is restricted to Pharm.D. students. Introduction to the concepts of self-care. In this course, students will learn how to identify signs and symptoms of problems that can be managed and treated through self-care, to determine which signs and symptoms are exclusions for self-care and to identify appropriate health care practitioners for referral. Students will also learn about non-medication methods to alleviate and prevent signs and symptoms of self-care problems. Additionally, students will be able to evaluate nonpharmacologic treatments that may be used to prevent and treat self-care issues. These concepts will be learned through the use of patient cases, self-care consultations, lectures, conferences and active participation in classroom and conference activities.

PHAR 507. Introduction to Health Informatics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment is restricted to Pharm.D. students. This course provides an introduction to the field of health informatics, exploring the intersection of health care, information technology and data management. Students will develop an understanding of the key concepts, theories and applications of health informatics, and gain practical skills to analyze, design and implement health information systems. Topics covered include electronic health records, health data standards, health care analytics, privacy and security, telehealth, and emerging trends in health informatics. Graded Pass/Fail/Honors.

PHAR 508. Evidence-based Pharmacy I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Enrollment is restricted to Pharm.D. students. This course is part of a P2 year-long series that will teach students how to evaluate and apply the principles of evidence-based medicine to contemporary pharmacy practice. This course will focus on case reports, case series, cross sectional, qualitative, case control and cohort studies. Within each module, students will learn the principles of epidemiology, biostatistics, study design and drug literature evaluation and apply these principles to patient care and other contemporary pharmacy practice issues. The course will use lectures, outside readings, class discussions and pre-class and in-class exercises to accomplish these objectives.

PHAR 509. Evidence-Based Pharmacy I: Introduction to Pharmacy Information Skills. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. This is the first of a three-course series introducing students to information skills necessary for the practice of evidence-based pharmacy. Lecture topics include drug information resources, efficient information retrieval, assessment of drug information sources, relationship of pharmaceutical industry to drug literature, and basic laws and regulations associated with prescription processing. Class exercises will be used to promote the appropriate use of drug information resources in pharmacy practice.

PHAR 511. Evidence-based Pharmacy II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Enrollment is restricted to Pharm.D. students. This course is part of a P2 year-long series that will teach students how to evaluate and apply the principles of evidence-based medicine to contemporary pharmacy practice. This course will focus on randomized controlled clinical trials, systematic reviews and meta-analyses. Within each module, students will learn the principles of epidemiology, biostatistics, study design and drug literature evaluation and apply these principles to patient care and other contemporary pharmacy practice issues. The course will use lectures, outside readings, class discussions and pre-class and in-class exercises to accomplish these objectives.

PHAR 512. Health Promotion and Disease Prevention. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Introduction to the role of the pharmacist in health promotion and disease prevention. Skills for pharmacist involvement in implementing aspects of Healthy People 2010, educating patients and addressing health care disparities will be emphasized.

PHAR 513. Contemporary Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. The goal of the course is to introduce students to basic principles of professional patient-centered pharmacy practice. The common thread between the various topics is the link between pharmacists' professionalism and effective medication use. Pharmacists who consistently engage in professional behaviors are better able to serve the health care needs of their patients.

PHAR 515. Continuous Professional Development I. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This the first of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance self-awareness and professionalism in student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 523. Foundations I. 2 Hours.
Semester course; 6 laboratory hours. 2 credits. A competency-based course that is intended to give the first-year pharmacy student an introduction to the pharmacy profession, emphasizing the skills and values that are necessary to be a competent, caring pharmacist. It is the first in a six-semester practice-based course sequence that introduces the language and tools of contemporary pharmacy practice with an emphasis on calculations, communication, medical terminology, drug information, prescription processing, health promotion, patient assessment and problem-solving.

PHAR 524. Foundations II. 1.5 Hour.
Semester course; 4.5 laboratory hours. 1.5 credits. This competency-based course is the second in a six-semester practice-based course sequence with an emphasis on the preparation and dispensing of selected extemporaneous compounds including liquid, solid and semisolid preparations and the appropriate use of selected OTC point-of-care devices.

PHAR 525. Communications in Pharmacy Practice. 2 Hours.
Semester course; 1.5 lecture hours and an average of 1 conference hour per week. 2 credits. A study of the theory and techniques of communication and counseling techniques related to pharmacy practice. Supervised practice in developing basic communication skills.

PHAR 526. Community Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Helps students develop the necessary foundation for the management of activities in community pharmacy practice settings with many of the skills developed in this course being equally applicable to other practice settings. Focuses on financial management and managed care as it affects community practice.

PHAR 529. Clinical Therapeutics Module: Introduction to Special Populations. 2 Hours.
Module course; 2 lecture hours. 2 credits. Introduction to issues affecting the pharmacotherapy of special populations such as pediatric and geriatric patients.

PHAR 530. Introductory Pharmacy Practice Experience: Community Practice. 4 Hours.
Semester course; daily for 4 weeks. 4 credits. Students will meet with an assigned community pharmacist 5 days per week for 8 hours for 4 consecutive weeks at the end of the P-1 year. Students will practice pharmacy under supervision while learning about the medication use system in community pharmacy practice. Students will demonstrate core practice skills: communication, pharmacy calculations, ethics, medication safety, wellness and health promotion, informatics and critical thinking. Graded as honors, high pass, pass, fail.

PHAR 532. Introductory Pharmacy Practice Experience: Hospital Practice. 3 Hours.
Semester course; 40 hours per week for three weeks. 3 credits. Students will meet with an assigned hospital pharmacist for a three-week (120 hours) experience at the end of the P-2 year to practice pharmacy in a hospital environment and learn about hospital pharmacy management and medication distribution systems. Students will demonstrate core practice skills: communication, calculations, ethics, medication safety, technology, informatics and critical thinking. Graded as honors, high pass, pass, fail.

PHAR 533. Introductory Pharmacy Practice Experience: Patient Care. 0.5 Hours.
Semester course; 0.5 laboratory hours. 0.5 credits. Students will complete 20 hours of approved experiences under supervision. An orientation, reading assignments, mandatory class time and assessments will be conducted. Students will also prepare a reflection describing the benefits to the community when pharmacists engage in the health and education needs of the community. Students will develop a sense of personal responsibility for addressing the problems and needs of society. Graded as Pass/Fail.

PHAR 534. Foundations III. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the third in a six-semester, practice-based course sequence with an emphasis on the clinical application of medications in the management of various disease states. The second-year pharmacy student will develop skills in the assessment and therapeutic monitoring of selected disease states and drug therapies. Topics include cardiovascular, endocrine and pulmonology therapeutics.

PHAR 535. Foundations IV. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the fourth in a six-semester, practice-based course sequence. Introduces students to the skills required to practice in institutional settings such as hospitals and long-term care facilities and in home health care.

PHAR 540. Self-Care and Alternative and Complementary Treatments. 2.5 Hours.
Module course; variable lecture and conference hours. 2.5 credits. Introduction to the concepts of self-care and alternative and complementary treatments. Students will learn to distinguish treatable signs and symptoms of common diseases and exclusions for care that require referral to appropriate health care practitioners. Non-medication methods to alleviate and prevent self-care problems are reviewed. Patient cases, self-care consultations, lectures and conferences will be used to facilitate learning.

PHAR 541. Patient Assessment in Pharmacy Practice. 2 Hours.
Semester course; variable lecture and laboratory hours. 2 credits. Provides students with an introduction to patient assessment skills necessary in patient-centered pharmacy practice. Course topics include basic physical assessment techniques, interpretation of findings from laboratory tests or physical examinations and documenting findings from patient assessments. Laboratory time will be used to practice various assessment skills. The course will also build on communication and information skills presented in previous courses.

PHAR 544. Clinical Therapeutics Module: Cardiovascular. 4.5 Hours.
Module course; variable hours. 4.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with cardiovascular diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 545. The U.S. Health Care System. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Enrollment is restricted to students in the Doctor of Pharmacy program. Designed to introduce the student to the components of the U.S. health care system and the interrelationships among health care consumers and providers. It also presents the organizational framework and regulatory and reimbursement mechanisms which are the foundations of the U.S. health care delivery system.

PHAR 546. Pharmacy-based Immunization Delivery. 1.5 Hour.
Semester course; 1 lecture and .5 independent study hours. 1.5 credit hours. Enrollment is restricted to students in the Doctor of Pharmacy program. This course, which is based on the CDC's national educational standards for immunization, emphasizes a health care team approach, fosters interventions that promote disease prevention and public health, and prepares pharmacists with the comprehensive knowledge, skills and resources necessary to provide immunization services to patients. This course is associated with the American Pharmacists Association's Pharmacy-Based Immunization Delivery Certificate Program. Each student will receive a Certificate from APhA after successful completion of the course. This course combines self-study course work and didactic live education sessions, along with hands-on administration techniques. Graded as pass/fail.

PHAR 547. Managing Professional Patient-centered Practice. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Introduces pharmacy students to the basic principles of managing a professional pharmacy practice. Students will learn patient-centered practices associated with effective medication use and positive patient outcomes. Instruction will be through lectures, case discussions and portfolio assignments.

PHAR 549. Personalized Medicine. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides an introduction to personalized medicine as related to pharmacy practice. The course will be taught using lectures, individual work, small-group discussions and total classroom discussion using homework, in-class assignments and patient case scenarios.

PHAR 550. Pharmacy Practice Research. 3 Hours.
Yearlong course; 3 lecture hours. 3 credits. Focuses on the development of skills necessary for identifying issues and questions related to pharmacy practice, evaluating the literature to identify possible solutions, designing a feasible research project, developing a data analysis plan and a formal written proposal for the project. Students will ultimately present their research proposals to faculty and students. The course is graded as CO with no credit for fall semester with a letter grade and credit assigned for spring semester.

PHAR 551. Pharmacy-based Point of Care Testing. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Enrollment is restricted to Pharm.D. students. This course will be based on the American Pharmacists Association and the University of Florida's Pharmacy-based Test and Treat certificate training program. Each student will receive a certificate from APhA after successful completion of the course. Students will complete the self-study over 10 weeks (asynchronously) prior to the five-week module. Graded as Pass/Fail.

PHAR 555. Clinical Therapeutics Module: Endocrinology. 2.5 Hours.
Module course; variable hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with endocrine diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 556. Clinical Therapeutics Module: Neurology. 3.5-4 Hours.
Module course; 3.5-4 lecture hours. 3.5-4 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with neurological diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 565. Evidence-based Pharmacy II: Research Methods and Statistics. 2.5 Hours.
Module course; variable hours. 2.5 credits. This is the second of a three-course series introducing students to the principles and practice of evidence-based pharmacy. Lecture topics include research methods, concepts and principles of study design, and appropriate use of statistics. Class exercises promote a working understanding of statistical principles and a general understanding of research methods.

PHAR 566. Evidence-based Pharmacy III: Drug Literature Evaluation. 2 Hours.
Module course; variable hours. 2 credits. This is the third of a three-course series introducing students to the principles and practice of evidence-based pharmacy. Lectures, outside readings, class discussions and exercises will be used to develop the skills necessary for the evaluation of biomedical literature and application to pharmacy practice.

PHAR 602. Clinical Therapeutics Module: Psychiatry. 3 Hours.
Module course; variable hours. 3 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with psychiatric illnesses are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 603. Clinical Therapeutics Module: Respiratory/Immunology. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with respiratory and immunologic illnesses are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 604. Clinical Therapeutics Module: Infectious Diseases. 4 Hours.
Semester course; 4 lecture hours (delivered face-to-face or hybrid). 4 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with infectious diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 605. Clinical Therapeutics Module: Hematology/Oncology. 2.5 Hours.
Module course; variable hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with hematologic diseases and cancer are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 606. Clinical Therapeutics Module: Nephrology/Urology. 2 Hours.
Module course; variable hours. 2 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with kidney and urologic diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 607. Clinical Therapeutics Module: Dermatology/EENT. 2 Hours.
and Joint Module course; variable hours. 2 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with diseases of the bone, skin, ears, eyes, nose and throat are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 609. Clinical Therapeutics Module: Reproductive Health, Dermatology, EENT, Bone and Joint. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Enrollment is restricted to Pharm.D. students. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in reproductive health issues, dermatology, EENT, joint and patients with bone diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, nonprescription and complementary treatments will be reviewed.

PHAR 614. Research Techniques. 1-4 Hours.
Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: PCEU 614/MEDC 614.

PHAR 615. Continuous Professional Development II. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This the second of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance self-awareness and professionalism in student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 618. Clinical Therapeutics Module: Gastrointestinal/Nutrition. 2.5 Hours.
Module course; variable hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with gastrointestinal diseases are integrated in this course. Nutrition will be covered. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 619. Clinical Therapeutics Module: Women's Health/Bone. 2 Hours.
Module course; variable hours. 2 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in women's health issues and patients with bone diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 620. Clinical Therapeutics Module: Critical Care/Toxicology and Complex Patients. 2.5 Hours.
Module course; 2.5 lecture hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with critical care diseases, toxicology emergencies and complex cases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, nonprescription and complementary treatments will be reviewed.

PHAR 621. Pharmacoeconomics. 2 Hours.
Module course; variable hours. 2 credits. Introduces the terms and processes of pharmaceutical economics and phamacoeconomics. Students learn to assess the impact of economics on phamaceutical use, evaluate pharmacoeconomic studies and make decisions on the cost effectiveness of therapeutic alternatives. Lectures, discussion and class assignments.

PHAR 623. Patient Medication Safety. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Provides the fundamental background necessary to understand patient medication safety, including multidisciplinary responsibilities for medication safety and approaches to the management and prevention of medication errors. Current issues in medication safety and actual medication error cases will be used in the class.

PHAR 626. Advanced Pharmacotherapy Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of the instructor. This course focuses on research techniques used to assess the clinical response to drug therapy, including advantages and disadvantages of different techniques. Published clinical trails are evaluated to illustrate these concepts including statistical assessment. Recent FDA New Drug Applications are reviewed when appropriate to illustrate regulatory aspects of the evaluation of clinical trials.

PHAR 631. Advanced Pharmacy Practice Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Classical, social, and systems views of management are introduced with emphasis on the uses of implicit control. The sociology of professions and the nature of professional work are explored; the management of the professional's work is discussed in detail. Design and operation of integrated drug information, drug distribution, and drug use control systems is explored. (Nontraditional program).

PHAR 637. Introduction to Research Methods in Pharmaceutical Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Assists practicing pharmacist managers and researchers in the development, implementation, monitoring and evaluation of programs for the delivery of pharmaceutical care and the practice of pharmacy. Introduces students to the empirical method and to provide them with a fundamental knowledge base for developing salient research questions that could lead to the articulation of testable research hypotheses, accomplished by addressing those research techniques and designs most commonly used in pharmacy and health services research.

PHAR 638. Pharmaceutical Benefit Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Addresses the need for pharmacy benefit management, the types of organizations that use pharmacy benefit management and the primary tools, techniques and practices used to manage the pharmacy benefit. Presents through lectures, readings, class discussions and a research paper.

PHAR 640. Foundations V. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the fifth in a six-semester practice-based course sequence with an emphasis on the clinical application of medications in the management of various disease states. The third-year pharmacy student will develop skills in the assessment and therapeutic monitoring of selected disease states and drug therapies. Topics include psychiatry, neurology and oncology therapeutics.

PHAR 645. Foundations VI. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the final installment in a six-semester, practice-based course sequence. It is intended to give the third-year pharmacy student opportunities to improve acquired skills and gain additional skills necessary to provide the highest level of patient-centered care by optimizing drug therapy outcomes.

PHAR 646. Ambulatory Care Pharmacy in the Free Clinic Setting. 2 Hours.
Semester course; 1 lecture and 1 clerkship (experiential education) hour. 2 credits. Enrollment is restricted to current P3 students in the Pharm.D. program. This course includes lectures, case discussions, clinical experience, quizzes, reflections, student self-evaluation and case presentations. Students will participate in four six-hour sessions in an interprofessional practice at a free clinic over the semester, as well as periodic on-campus discussions to reinforce clinical learning. Class discussions may require prereadings and Blackboard readiness quizzes. Graded as pass/fail/honors.

PHAR 652. Health Promotion and Communication in Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours (delivered face-to-face or hybrid). 2 credits. Enrollment is restricted to Doctor of Pharmacy students. The course will provide a study of the theory and techniques of communications and counseling related to pharmacy practice. The course is designed to introduce students to the role of the pharmacist in health promotion and disease prevention and build communication skills to help prepare students for practice. Students will learn the knowledge and skills required for pharmacist involvement in these activities as well as obtain practical experience in the development and delivery of these services. Upon successful completion of the course, students will be recognized as trained “lifestyle coaches” eligible to deliver the evidence-based National Diabetes Prevention Program.

PHAR 660. Community Pharmacy Practice Management II. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Enrollment is restricted to Pharm.D. students. This course helps students develop the necessary foundation for the management of activities in community pharmacy and any other practice settings. The course focuses on helping students understand what it takes to offer clinical services in pharmacy settings and be able to develop plans to implement them.

PHAR 663. Advanced Diabetes Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An in-depth study of the care of patients with metabolic syndrome and diabetes. The etiology, pathophysiology, clinical course, clinical manifestations, prevention and management of diabetes will be reviewed through the use of online didactic presentations, patient cases, self-directed learning and active participation in classroom discussion. Emphasis is placed on the use of data to optimize pharmacotherapy for patient scenarios.

PHAR 664. Making Medicines: The Process of Drug Development. 1 Hour.
Semester course; 1 lecture hour (delivered online). 1 credit. This is a self-paced, eLearning course developed in collaboration with a team of academic leaders designed to deliver a scientific education curriculum highlighting the fundamental processes and rigor drug manufacturers undertake to research, develop and deliver new medicines to patients. Graded as Pass/Fail.

PHAR 665. Residency and Fellowship Preparatory. 1 Hour.
Semester course; 1 lecture hour (delivered online or face-to-face). 1 credit. Intended for third-year Pharm.D. students interested in pursuing postgraduate training (residency, fellowship, etc.). This course will include readings, lectures, topic discussions, panel discussions, classroom activities and out-of-class assignments. Some of the topics include, but are not limited to, letters of intent, reference letters, interviewing and preparing for American Society of Health-System Pharmacists midyear clinical meeting and/or personal placement service. Graded as Pass/Fail/Honors.

PHAR 666. Advanced Topics in Pharmacy. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presentation of pharmacy subject matter by lectures, conferences or clinical site visits in selected areas of advanced study providing a discussion of topics beyond that provided in the required curriculum.

PHAR 667. Seven Habits of Effective Pharmacists. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course is intended to provide students with an overview of what constitutes emotional intelligence and how they can harness that knowledge to become better practitioners. Structured around Stephen Covey's "7 Habits of Highly Effective People," students will spend time learning how to understand and use EI skills in their own personal, as well as professional, life's journey. Graded as Pass/Fail/Honors.

PHAR 668. Academic Pharmacy. 3 Hours.
Semester course; 2 lecture and 1 practicum hours. 3 credits. Prerequisite: PHAR 523 with a minimum grade of B. Enrollment requires approval by course coordinators. This course is for third-year Doctor of Pharmacy students interested in exploring or pursuing a career in academia. Students will learn the structure of academia, types of research, teaching methods and core concepts of academia through weekly two-hour didactic instruction and service in PHAR 523 as small-group facilitators, volunteer patients, proctors and classroom facilitators. Graded as Pass/Fail/Honors.

PHAR 669. Pediatric Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Students will develop and apply a systematic process for assessing, treating and creating a monitoring plan for a pediatric patient. Students will be required to integrate new knowledge regarding the pathophysiology, clinical presentation and treatment of selected pediatric diseases with the basic principles of pediatric clinical pharmacology previously learned in the core Doctor of Pharmacy curriculum. The course will be taught through lecturers with expert pediatric knowledge in their respective specialties. Student and faculty will deliver presentations, case workshops, drug information questions and individual quizzes, and a post-assessment examination will be used to help students learn and apply basic course concepts. Students interested in specializing in pediatric pharmacy or who would like to gain more experience in pediatrics are the intended audience. Graded as Pass/Fail/Honors.

PHAR 670. Geriatrics – Demystifying a Population. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course employs an interprofessional team approach to teach key concepts in comprehensive geriatric care. The course aims to develop students' geriatric knowledge base and clinical reasoning skills. Students will also gain experience working in teams and sharing information.

PHAR 671. Applied Pharmacoeconomics and Outcomes Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Presents theoretical and practical topics relating to pharmacoeconomics and health outcomes research. Students will learn to critically appraise and discuss pharmaceutical outcomes research through lectures, readings, class participation and projects. Requires students to plan, initiate and present an outcomes research project that considers both clinical and economic issues of product or service selection.

PHAR 672. Advances in Mental Health Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Students choose the topics for discussion in this elective course. They actively learn through small group discussions of the pharmacotherapy of psychiatric disorders. Students gain experience in patient rounds, practice-based projects, interpretation of clinical practice guidelines, use of the Internet and computer presentations.

PHAR 673. Advanced Cardiovascular Pharmacotherapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PHAR 544. Students will gain a broader knowledge and deeper understanding of the etiology, pathophysiology, clinical course, clinical manifestations, prevention and management of cardiovascular disorders through the use of online didactic presentations, videos, patient cases, self-directed learning and active participation in classroom discussion.

PHAR 674. Navigating DME as a PharmD. 1 Hour.
Semester course; 15 lecture hours. 1 credit. Enrollment is restricted to students in the Doctor of Pharmacy program on the Richmond campus. Students will acquire foundational knowledge on the proper use of durable medical equipment and devices routinely purchased over the counter by patients. The course explores the pharmacist's essential role in expanding patients' access to medical counseling, particularly in medically underserved areas of the U.S., and how that necessitates a working knowledge of durable medical equipment and devices. The course addresses issues in patient access through a health literacy lens, emphasizing the importance of empathy in practice. It takes an interprofessional approach to patient-controlled devices, exposing students to the philosophies of occupational therapy and other rehabilitation professions regarding disease and disability. Hands-on lab activities will be incorporated into most class sessions. Graded as pass/fail.

PHAR 677. Advanced Infectious Diseases Pharmacotherapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. The specialty of infectious diseases includes diagnosis, pathophysiology, treatment and monitoring of patients with infections. It also includes ensuring appropriate use of antimicrobials in order to mitigate antimicrobial resistance progression. The pharmacist's contribution in this area is primarily in the appropriate selection, use and monitoring of antimicrobial therapy. This course serves as an advanced introduction to the use of antimicrobial agents, with emphasis on selected disease states, microbiological and laboratory aspects and antimicrobial stewardship principles.

PHAR 678. Health Informatics and Excel: A Practical Partnership. 1 Hour.
Semester course; 15 lecture hours. 1 credit. Enrollment is restricted to Doctor of Pharmacy students; minimum of three students at distant site campus. The course is intended to provide students with an overview of health informatics and the data contained in available administrative databases. Students will learn how to understand and transform these data into information and knowledge, using Excel and Excel VBA. Using data visualization techniques and linking to PowerPoint, students will learn how to effectively present to a variety of audiences. Graded as pass/fail.

PHAR 680. Introduction to Data Science and Rapid Prototyping. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Enrollment is restricted to students in the Pharm.D. program. This introductory course integrates data science and rapid prototyping techniques with pharmacy practice, focusing on health care applications. Students will engage in hands-on learning, using code-free approaches applied to natural language processing, machine learning, 3D printing, virtual reality and microcontroller programming. The course bridges technology and patient-centered care, enhancing problem-solving and technical skills in a health care context.

PHAR 685. Contemporary Topics in Pharmacy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Explores how pharmacists prepare for and respond to the issues that affect the practice of pharmacy. Contemporary issues that relate to major health care needs, government health care activities, views by health professionals, health policies, health care economics, pharmacist attitudes and behaviors, pharmacy laws and regulations, pharmacy traditional views and opinions will be examined. Discussion and debate on these issues will help to prepare students for their future in pharmacy practice.

PHAR 688. Applied Pharmacoepidemiology Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and BIOS 544 or permission of instructor. Provides an overview of the field of pharmacoepidemiology and its relationship to health care and research. Topics including selecting data sources, study design, data manipulation and analytical issues relevant to the conduct of pharmacoepidemiology research are covered. Students complete exercises to reinforce these topics, as well as prepare a formal project proposal. Research studies are also reviewed to help students develop skills in the critical evaluation of the pharmacoepidemiology literature.

PHAR 689. Pharmaceutical Policy Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 500 or ECON/HADM 624, or permission of instructor. Examines a breadth of pharmaceutical policy issues pertaining to stakeholders in health care including the federal government, state governments, the pharmaceutical industry, pharmacies and pharmacists, and consumers. Using an economic approach to policy analysis, various competing thoughts and challenges to health care will be presented. Special attention will be paid to theoretical foundations and scientific rigor in approaching policy analysis.

PHAR 690. Pharmacy Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Required of all graduate students in pharmacy. Research seminar.

PHAR 691. Special Topics in Pharmacy. 1-5 Hours.
Semester course; 1-5 lecture hours. 1-5 credits. Presentation of subject matter is by lectures, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training. Graded as honors, high pass, pass, fail.

PHAR 697. Directed Research in Pharmacy. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S., Pharm.D., or Ph.D. degree.

PHAR 702. Pharmacy Practice Management. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. Enrollment is restricted to Pharm.D. students. The goal of the course is to develop the necessary foundation for the management of activities in pharmacy practice settings. This course focuses on financial management and managed care as it affects community practice, however many of the elements of this course can be applied to multiple settings. It is not the purpose of this course to make students management or economic experts. Equipped with this essential information, students will be able to apply principles of financial management to pharmacy practice related problems and, by understanding principles of managed care pharmacy, will be better able to understand and practice in the current pharmacy practice environment.

PHAR 703. Clinical Therapeutics Module: Complex Patient Cases and Critical Care. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Enrollment is restricted to Pharm.D. students. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with critical care diseases, toxicology emergencies and complex cases from throughout the curriculum are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, nonprescription and complementary treatments will be reviewed.

PHAR 715. Continuous Professional Development III. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This the third of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance self-awareness and professionalism in student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 724. Pharmacy Law. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. A study of federal and state laws, including statutes, regulations and cases, affecting the practice of pharmacy and the distribution of drugs. This course includes material on ethics.

PHAR 730. Continuous Professional Development IV. 0.5 Hours.
Yearlong course; 0.5 lecture hours. 0.5 credits. This the fourth of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 760. Acute Care Pharmacy Practice I. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in an acute care hospital setting. Students will actively participate in the delivery of patient care on a general medicine service. Students may participate in the following types of activities: rounding with a health care team, obtaining patient histories, identifying problems requiring therapeutic interventions, solving problems, consulting with physicians, monitoring patient outcomes and providing educational sessions for the professional staff. These services are expected to be integrated with the hospital pharmacy services. Graded as H/HP/P/F.

PHAR 761. Advanced Hospital Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in a hospital pharmacy department. Students will actively participate in pharmacy operations and services relating to systems for drug distribution and drug control, scope of clinical services provided by the department, management of the department, and department relationships within the institution and health system. Graded as H/HP/P/F.

PHAR 762. Geriatrics Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in a variety of settings with a predominately geriatric focus. These sites may include community pharmacies, specialty clinics, rehabilitation hospitals, skilled nursing facilities, home-based consult services and assisted living facilities. Students will focus on the unique medication-related needs of seniors and actively apply that special knowledge to provide quality pharmacy care to older adults. Graded as H/HP/P/F.

PHAR 763. Ambulatory Care Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in an ambulatory care, multidisciplinary practice setting. These sites may include hospital-based clinics, physician group practices, safety net clinics and managed care facilities that provide health care directly to patients. Students will actively participate in obtaining patient medical and medication histories, evaluating drug therapies, developing pharmacy care plans, monitoring patients' therapeutic outcomes, consulting with physicians and non-physician providers and providing education to patients and health care professionals. Graded as H/HP/P/F.

PHAR 764. Community Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. In this course, students will participate in all facets of pharmacy practice in the community pharmacy setting. Students will be involved in dispensing, compounding, telephone consultation, patient counseling and nonprescription drug recommendations. Students also will be involved in patient assessment, monitoring intervention and follow-up care designed to improve the outcomes of drug therapy. Graded as H/HP/P/F.

PHAR 765. Elective I. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. In this course, students will be able to participate in a variety of pharmacy practice settings. Graded as H/HP/P/F.

PHAR 766. Elective II. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. In this course students participate in a variety of pharmacy practice settings. Graded as H/HP/P/F.

PHAR 767. Clinical Selective I. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. Restricted to Pharm.D. dual-degree candidates. In this course students participate in a clinical rotation and may choose one of these pharmacy practice settings: ambulatory care, acute care, advanced community, institutional or geriatric. Graded as H/HP/P/F.

PHAR 768. Advanced Community Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in a community pharmacy setting. Students will focus primarily on patient care services and secondarily on patient-focused dispensing functions in these pharmacies. These services will focus on the identification, resolution and prevention of medication-related problems dealing with general medicine issues and medication therapy management. Students will actively participate in the following types of activities: interacting with patients, caregivers and prescribers; counseling, self-care consults and recommendations; administration of immunizations; and health and wellness screenings and information. Graded as H/HP/P/F.

PHAR 769. Clinical Selective II. 5 Hours.
Semester course; daily for 5 weeks (200 clinical hours). 5 credits. Restricted to Pharm.D. dual-degree candidates. In this course students participate in a clinical rotation and may choose one of these pharmacy practice settings: ambulatory care, acute care, advanced community, institutional or geriatric. Graded as H/HP/P/F.

PHAR 771. Student Pharmacist Professionalism. 1 Hour.
Continuing course; variable hours. 1 credit at end of four-year curriculum. Selected presentations and activities related to the development and enhancement of professional behavior in student pharmacists. Graded as CO until final semester, with pass/fail awarded on completion.

PHAR 773. Acute Care Pharmacy Practice II. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in an acute care hospital setting. Students participate in the delivery of patient care in a general medicine or a medical specialty service. Students may participate in the following types of activities: rounding with a health care team, obtaining patient histories, identifying problems requiring therapeutic interventions, solving problems, consulting with physicians, monitoring patient outcomes and providing educational sessions for the professional staff. These services are expected to be integrated with the hospital pharmacy services. Graded as H/HP/P/F.

Center for Interprofessional Education and Collaborative Care

Interprofessional Education and Collaborative Care (IPEC)

IPEC 501. Foundations of Interprofessional Practice. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to students enrolled in a professional health science degree program. An introductory study of the concept of interprofessional collaborative practice, this course includes units on health care systems, teams and teamwork, and professional roles and responsibilities. Students actively work within interprofessional student teams to apply course content during specific learning activities that build a foundation of the knowledge, skills and attitudes necessary for effective interprofessional practice in contemporary health care.

IPEC 502. Interprofessional Quality Improvement and Patient Safety. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment is restricted to students in the College of Health Professions and the schools of Medicine, Nursing and Pharmacy. A study of interprofessional quality improvement and patient safety, this course includes units on quality in the workplace, error in the health care system and improving health care. Students actively work within interprofessional student teams to apply course content to specific learning activities for interprofessional quality improvement and patient safety practice. Graded as pass/fail.

IPEC 510. Interprofessional Communication and the Care Coordinator I. 1 Hour.
Semester course; 1 lecture hour (delivered online). 1 credit. Defines the various roles of the care coordinator. Identifies all health care providers on the interprofessional team and what their responsibilities are to patient and family care. Focuses on development of effective interprofessional communication and leadership strategies by introducing concepts of teamwork. Explores strategies for conflict negotiation and patient engagement. Facilitates the sharing of individual perspectives and patient care experiences.

IPEC 511. U.S. Health Care and Care Coordination. 2 Hours.
Semester course; 2 lecture hours (delivered online). 2 credits. Explores the overall infrastructure of the health care system and care delivery models. Introduces concepts of regulation. Examines how the effect of different settings and levels of care impact care transitions. Explores effective use of the electronic health record. Identifies the patient-centered care model as integral to improving outcomes. Describes the best ways to share information across health care settings during care transitions.

IPEC 512. Health Care Payment Models and Care Coordination. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits. Examines aspects of health care financing that affect the type of services the care coordinator can provide. Provides an overview of key points related to insurance coverage, including managed care, Medicare and Medicaid. Reinforces the utilization review process and compliance. Discusses an overview of current U.S. health policy with a special focus on vulnerable patients and the importance of population health management.

IPEC 513. Ethical and Legal Considerations in Care Coordination. 2 Hours.
Semester course; 2 lecture hours (delivered online). 2 credits. Focuses on applying ethical decision-making frameworks to analyze ethical dilemmas that occur with patient care and between members of the interprofessional team. Examines care coordinator role conflict between patient advocacy versus health system advocacy. Provides a framework for identifying potential liabilities while working in the care coordinator role. Examines issues surrounding access to care and social justice. Explores legal responsibilities of the care coordinator.

IPEC 514. Hospital-based Care Coordination. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits. Explores care coordination in the hospital setting with a focus on discharge planning, medication reconciliation and effective care transitions out of the hospital. Addresses how to identify those patients who have high risk for excess utilization of hospital resources due to limited financial means, lack of insurance, chronic illness, and/or catastrophic injury. Addresses national recommendations for effective care coordination strategies to improve patient outcomes.

IPEC 515. Interprofessional Communication and the Care Coordinator II. 1 Hour.
Semester course; 1 lecture hour (delivered online). 1 credit. Prerequisite: IPEC 510. Reinforces roles and responsibilities of health care providers on the interprofessional team during care coordination and prepares students to assume a professional role. Applies effective interprofessional communication and leadership strategies by reinforcing concepts of teamwork. Explores strategies for conflict negotiation and patient engagement. Facilitates the sharing of individual perspectives and patient care experiences.

IPEC 516. Community-based Care Coordination. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits. Prerequisites: IPEC 511, IPEC 512, IPC 513, IPEC 514 and IPEC 515. Enrollment is restricted to students in the care coordination certificate program. Emphasizes the value of maintaining a primary care provider and connecting the patient with appropriate community resources. Emphasis will be on the patient-centered medical home model of health care delivery, which provides an environment conducive to direct coordination of a patient's primary care with a special focus on effective care transitions. Discusses concepts of advanced care planning, medication management and patient engagement from the outpatient perspective. Identifies how to differentiate high-risk patient populations and provide effective transitions of care within community settings. Introduces concepts of population health and the role of the family in care of the patient.

IPEC 525. Mindfulness Practices for Health Care Professionals: Clinical Applications. 1 Hour.
Semester course; 16 hours (lecture/seminar). 1 credit. Open to health care professional students in good standing (e.g. students in the schools of Dentistry, Nursing, Medicine, Pharmacy, Allied Health Professions or Social Work or in the programs of dental hygiene or clinical psychology). This course will allow a qualified health care professional student the opportunity to participate in a variety of mindfulness practices and learn their applications to clinical practice.

IPEC 528. Global Health and Health Equity. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course will cover health disparities, health equity, international health, and being a community member as well as a provider and advocate for the community. The course will focus on practicing health care in a low-resource setting, health disparities that exist in these settings, and the concepts and goals of what it means to be a health care provider in low-resource settings both domestically and abroad. Participation in a health services brigade is not required. Graded as Pass/Fail.

IPEC 560. Interprofessional Collaborative Care for Older Adults. 1 Hour.
Semester course; 1 lecture hour (delivered online). 1 credit. Health professional learners from multiple disciplines will collaborate to identify health care needs and plan care for an older adult. Contemporary theoretical concepts and evidence-based recommendations will be integrated within a complex, unfolding case that crosses all settings of care: ambulatory, inpatient, post-acute, community-based and palliative/end-of-life. Patient- and family-centered care concepts will also be emphasized throughout each module. Learners who participate in this preceptor-supervised virtual case will make decisions based on their discipline-specific geriatric/gerontological competencies, practice identifying and retrieving evidence to fill gaps in knowledge, reinforce understandings about the scope of practice for other health professions, and expand working capacity for interprofessionalism and team-based care. Graded as Pass/Fail.

IPEC 561. IPE Virtual Geriatric Case. 2 Hours.
Semester course; 2 lecture hours (delivered online). 2 credits. Health professional learners from multiple disciplines will collaborate to identify health care needs and plan care for an older adult. Contemporary theoretical concepts and evidence-based recommendations will be integrated within a complex, unfolding case that crosses all settings of care: ambulatory, inpatient, post-acute, community-based and palliative/end-of-life. Patient- and family-centered care concepts will also be emphasized throughout each module. Learners who participate in this preceptor-supervised virtual case will make decisions based on their discipline-specific geriatric/gerontological competencies, practice identifying and retrieving evidence to fill gaps in knowledge, reinforce understandings about the scope of practice for other health professions, and expand working capacity for interprofessionalism and team-based care. Graded as pass/fail.

IPEC 562. IPE Quality Improvement Project Practicum. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: IPEC 502 or HADM 609 or approval by course director. Enrollment restricted to students in the schools of Allied Health Professions, Medicine, Nursing and Pharmacy. This capstone course will provide interprofessional teams of students the opportunity to apply quality improvement processes and patient safety theories, models, methods, and tools in a health care setting to execute a quality improvement project in an organizational setting. Graded as Pass/Fail.

IPEC 563. Interprofessional Complex Care Coordination. 2,3 Hours.
Semester course; 2-3 lecture hours. 2-3 credits. May be repeated for a maximum of six credits. This course focuses on the health care utilization of complex patients and identifies root causes of patients who require frequent health care services. Students actively explore topics such as how social determinants impact health, motivating change in others, how best to link complex patients to community services, the complexity of medication adherence and the importance of interprofessional teams to future professional success. Students build confidence in interprofessional health care delivery by working within interprofessional student teams to apply concepts of care coordination to complex patients. Graded as pass/fail.

IPEC 591. Interprofessional Special Topics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Explores specific topics in interprofessional education and collaborative care theory and practice. Sections may include lecture and/or clinical hours. See Schedule of Classes for topics offered each semester. Graded as pass/fail.