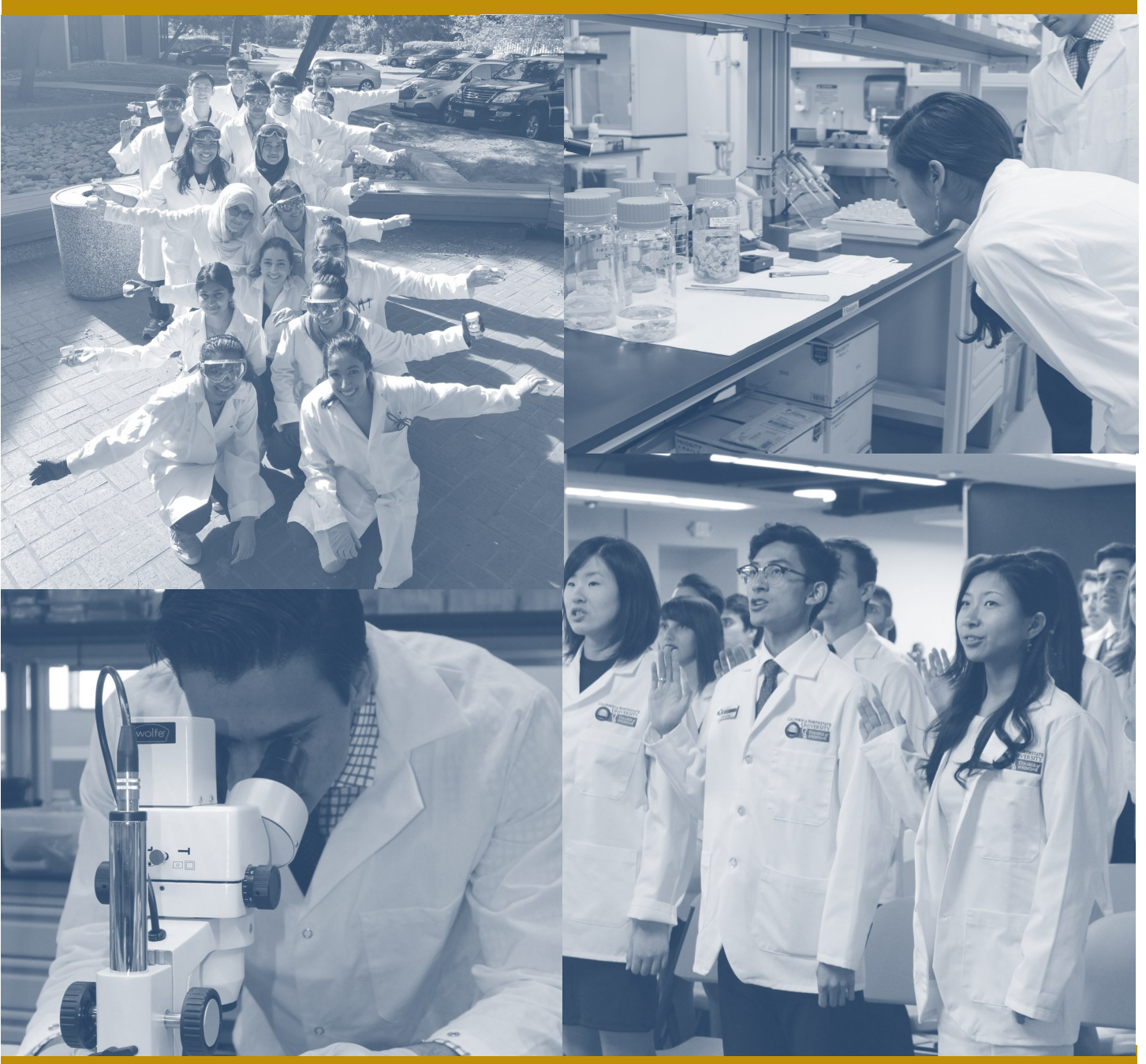




CALIFORNIA NORTHSTATE UNIVERSITY

2018-2019 General Catalog Addendum



CALIFORNIA NORTHSTATE UNIVERSITY

December 2018 Volume 1.1

THE PROVISIONS OF THIS CATALOG REFLECT
INFORMATION AS OF THE DATE OF PUBLICATION.

NOTICE:

This University General Catalog Addendum is not a contract nor an offer to enter into a contract and is updated on an annual basis. While every effort is made to ensure the accuracy of the information provided in this University General Catalog Addendum, it must be understood that all courses, course descriptions, designations of instructors, curricular and degree requirements and other academic information described herein are subject to change or elimination at any time without notice or published amendment to this catalog. In addition, California Northstate University reserves the right to make changes at any time, without prior notice, to programs, policies, procedures and information, which are described in this University General Catalog Addendum only as a convenience to its readers. Fees and all other charges are subject to change at any time without notice. Students should consult the appropriate academic or administrative department, college, or other service provider for currently accurate information on any matters described in this University General Catalog Addendum; contact information is available at <http://www.cnsu.edu/>

As a prospective student, you are encouraged to review this catalog prior to signing an enrollment agreement. You are also encouraged to review the School Performance Fact Sheet, which must be provided to you prior to signing an enrollment agreement.

IT IS THE RESPONSIBILITY OF THE INDIVIDUAL STUDENT TO BECOME FAMILIAR WITH THE ANNOUNCEMENTS AND REGULATIONS OF THE UNIVERSITY PRINTED IN THIS GENERAL CATALOG ADDENDUM.

California Northstate University will provide assistance to the visually impaired regarding the information contained in this catalog. Questions should be directed to the office or department concerned.

The 2018-2019 University General Catalog Addendum covers the academic year from June 1, 2018 to May 31, 2019.

University General Catalog Addendum Academic Year 2018-2019

Professional and Undergraduate Programs

College of Pharmacy

College of Medicine

College of Psychology

College of Health Sciences

Master of Science in Pharmaceutical Sciences



CALIFORNIA
NORTHSTATE
UNIVERSITY

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CALIFORNIA NORTHSTATE UNIVERSITY

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No changes

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No changes

STUDENT RECORDS

No changes

UNIVERSITY POLICIES

No changes

DIRECTORY

No changes

COLLEGE OF MEDICINE

M4 ELECTIVE COURSE DESCRIPTIONS-Revised

M4 Sub-Internships

Sub-Internships completed away are indicated on the transcript as xxx891. For the following Sub-Internships, please see the specialty area within the section M4 Electives.

Sub-Internships = 1.5 credit units per week (60 contact hours).

EME 801 - Emergency Medicine Sub-Internship

INT 801 - Internal Medicine Sub-Internship

INT 802 - Inpatient Medicine Sub-Internship

PED 801 - Pediatric Sub-Internship

PUL 801 - Pulmonary & Critical Care Medicine Sub-Internship

OBG 801 - OB/GYN Sub-Internship

SUR 801 - Surgery Sub-Internship

FAM 801 - Family Medicine Sub-Internship

M4 Electives

EXTERNAL/AWAY ROTATIONS

Elective course credit = 1 credit unit per week (40 contact hours).

On the transcript, away rotations are indicated as xxx899 or xxx898. For example, EME 899 indicates an Emergency-area external/away rotation. Students apply independently for placement typically through VSAS or by separate application.

ALLERGY/IMMUNOLOGY (AAI)

AAI 810 Allergy, Asthma, Immunology
(4 week rotation)

Specialty area: Allergy/Immunology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Office based allergy practice that will help the learner to manage allergic diseases from rhinitis, asthma, food allergies, primary immunodeficiency, angioedema, and anaphylaxis. Additional areas for longer options (if

multiple rotation lengths are offered) include spirometry, skin testing, allergy injections, drug desensitization, and care of anaphylaxis. Students will demonstrate knowledge pertaining to the management of allergic diseases including rhinitis, asthma, food allergies, primary immunodeficiency, angioedema and anaphylaxis.

AAI 812 Allergy & Immunology (4 week rotation)

Specialty area: Allergy/Immunology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Allergy Medical Group of Northern Area - Sacramento Clinic; Roseville Clinic

This elective rotation is a four (4) weeks structured clinical experience under direct supervision of an endocrinology attending designed to orient students how to obtain problem focused history from patients with atopic disease focused physical exam. Students will also be exposed to patients with atopic disease. This intensive month will provide an opportunity for the students to do more in-depth reading about the various atopic diseases and conditions they see. Students are expected to attend and participate in all scheduled educational activities at the host institution. Students will learn basic information of following diseases: basic atopic diseases, allergic rhinitis, sinusitis, asthma, urticarial, angioedema, food allergy/intolerance, drug allergy, insect allergy, environmental sensitivity. Students will perform a comprehensive history and physical examination in a timely manner and will gain experience in generating more specialized differential diagnoses, assessments, and diagnostic and treatment plans.

ANESTHESIA (ANE)

ANE 810 Anesthesia (4 week rotation)

Specialty area: Anesthesia

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Students seeking to increase their knowledge of anesthesiology and perioperative medicine will actively participate in the anesthetic care of surgical patients. Progressive and increased responsibility for pre-, intra-, and postoperative patient management will be assumed by the student under the direction of an anesthesiologist. The student will participate fully in the perioperative anesthetic care of a healthy patient during uncomplicated surgery. Students will participate in the department's didactic conferences; reading is required to meet learning objectives. Students will learn to perform pre-anesthetic evaluation, present an organized summary of findings, develop a rational plan of anesthetic management -Discuss effects of surgery and anesthesia on common medical conditions and execute plans to manage these conditions perioperatively conduct the intraoperative administration of anesthesia demonstrating knowledge of anesthetic pharmacology, perform peripheral venous, cannulation, bag and mask airway management, endotracheal intubation.

ANE 811 The Art and Practice of Anesthesiology and Pain Medicine (4 week rotation)

Specialty area: Anesthesia

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sutter Roseville Medical Center

4-week rotation. Students will be assigned to an attending anesthesiologist each day and may rotate to another anesthesiologist depending on cases and anesthetic techniques used. Special emphasis is given to airway management, pre-operative evaluation, intra-operative and post-operative care of patients. Students will rotate to the ambulatory surgery centers, hospital inpatient surgical and obstetric department. Exposure to ICU and trauma patients will be included when students work alongside an on-call trauma anesthesiologist when available. Three didactic sessions will be given per week emphasizing the learning objectives. In addition, clinical and basic science articles will be critically reviewed and discussed. Complicated cases will also be analyzed and discussed. Students will learn:

- 1) Clinical skills include basic airway management, physiological monitoring, sedation and pain management.
- 2) Knowledge of basic anesthetic agents, intra-operative and pain medications.
- 3) Critical review of basic and clinical anesthesia literature.
- 4) Exposure to different anesthetic techniques from lines placement to regional and neuraxial anesthesia.
- 5) Techniques in stabilizing an unstable patient.

ANE 812 Anesthesia (2 – 4 week rotation)

Specialty area: Anesthesia

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sutter Medical Center, Sacramento

Students seeking to increase their knowledge of anesthesiology and perioperative medicine will actively participate in the anesthetic care of surgical patients. Progressive and increased responsibility for pre-, intra-, and postoperative patient management will be assumed by the student under the direction of an anesthesiologist. The student will participate fully in the perioperative anesthetic care of a healthy patient during uncomplicated surgery.

CARDIOLOGY (CAR)

CAR 810 Cardiology Clinical Rotation

(2 – 6 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sutter Medical Center, Sacramento

Students will be exposed to a wide range of cardiology experiences including inpatient consultation and procedures, as well as advanced heart failure and transplant clinical committee meetings, and outpatient office setting. They will be expected to have some initiative and ask questions and as such will “get out of it what they put into it.” Students will be quizzed on differential diagnoses and treatment plans. (Pre-req: M4 standing & ICU Req.)

CAR 811-1 Cardiology Elective (2 – 6 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Chinese Hospital and Clinics, Daly City

The major goal of this elective is to construct the clinical environment for the senior students to develop outpatient management responsibilities in the broad field of medicine that will allow confident transition to resident level responsibilities in all disciplines. The students will be directly supervised by faculty attending. Procedures required by the patient, will be performed by the student depending on experience and safety. After completing this course, the student should be able to: A. Perform a comprehensive history and physical exam for the purpose of evaluation and management in an outpatient clinical setting. B. Gather information, formulate differential diagnoses, and propose plans for the initial evaluation and management of patients with common presentations. C. Manage follow-up visits with patients having one or more common chronic diseases. D. Recognize acute care medical problems, as well as ethical and managed care issues E. Demonstrate competency in advanced elicitation of history, communication, physical examination, and critical thinking skills. F. Obtain basic technical skills suitable for the level of training G. Perform responsible medical care management decisions.

CAR 811-2 Cardiology Elective (4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Student will work with faculty attending to evaluate and manage cardiac patients in both an outpatient and inpatient setting. Students will be introduced to reading EKG's, echo, and observe cardiac cauterization and transesophageal echo. To become familiar with management of patients with heart failure, myocardial infarction, arrhythmia, etc. and to provide medical students with experience in addressing and managing patients with cardiac issues.

CAR 811-3 Cardiology Elective (4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): SMG Cardiology-Sutter Medical Center

Diagnosis and therapy of common cardiac diseases. Fundamentals of cardiac anatomy and physiology – working knowledge of common cardiac disease states – cardiac pharmacology interpretation of cardiac diagnostic studies (ECG, ECHO, Stress testing, and Nuclear Imaging) – cardiac history and physical examination. 12 lectures: ECG, ECHO, coronary anatomy and physiology, methods for evaluating cardiac disease, valvular heart disease, guideline: lipids, hypertension, risk factors, arrhythmia including ablation therapy, atrial fibrillation, peripheral vascular disease (arterial and venous), devices including resynchronization therapy, CAD diagnosis and treatment, treatment of CHF.

CAR 880S Cardiovascular Surgery (4 week rotation)

Specialty area: Surgery

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sutter Medical Center Sacramento
Students will understand cardiovascular pathophysiology and develop basic surgical skills. Pre assessment, operative experience, and post-operation care. This intensive month will provide an opportunity for the students to do more in-depth reading about the various atopic diseases and conditions they see. Students are expected to attend and participate in all scheduled educational activities at the host institution.
Specialty Area(s): *Cardiology; Surgery.*

CAR 881S Cardiothoracic Surgery (4 week rotation)

Specialty area: Surgery

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Mercy San Juan Hospital

Lung Cancer, Esophageal Cancer, Thymus cancer, Airway Disease, Esophageal Reflux Disease, Diaphragm Disease, Chest wall issues, critical care for surgery, Lung Screening, Management of Stage IV cancers, Interventional Bronchoscopy and Esophagostomy. Clinical experiences includes rounds, seeing patients, consults, and surgery.

DERMATOLOGY (DER)

DER 810 Dermatology (4 week rotation)

Specialty area: Dermatology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Students will learn about medical surgical dermatology. The student will be exposed to medical dermatology encounters with patients having primary skin disease, to include immunobullous diseases, contact dermatitis, connective tissue diseases, congenital skin disease, skin cancer, and infectious diseases, as well as medically-complicated patients displaying dermatologic manifestations of systemic disease or therapy. Clinical experiences includes working with other residents/fellows.

DER 811 Dermatology (4 week rotation)

Specialty area: Dermatology

Sponsor(s): Dept. Med. Ed. & Affiliated Institutions

Locations: Kaiser Permanente – Fresno

This elective is customized to the specific interests of the 4th year medical student interested to learn more about medical and surgical aspects of dermatology. The student will be exposed to medical dermatology encounters with patients having primary skin disease, to include immunoblot diseases, contact dermatitis, connective tissue diseases, congenital skin disease, skin cancer, and infectious diseases, as well as medically-complicated patients displaying dermatologic manifestations of systemic disease or therapy. Will work with board-certified Dermatologists directly

EMERGENCY MEDICINE (EME)

EME 801 Emergency Medicine Sub-Internship

(4 week rotation)

Specialty area: Emergency Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Multiple

Students will take a higher level of responsibility in the evaluation and management of emergency medicine or related specialty. Students will also be exposed to disaster medicine, wilderness medicine, and ultrasound in emergency care. In addition to primary care responsibilities, there will be daily lectures and/or conferences. Students are expected to attend and participate in all scheduled educational activities. Students will be managing patients as primary caregivers, under direct supervision by an attending physician. Students will learn how to perform a focused history and physical examination and will gain experience in generating differential diagnoses, assessments, and diagnostic and treatment plans at a level above the completed Emergency Medicine internship. Students will participate in a number of procedures including wound closure, reduction and splinting, incision and drainage etc. with guidance from experienced residents and faculty members. In addition, students will actively participate in both medical and trauma resuscitations during their rotation at Bellevue. (Pre-requisite: M4 standing; COM 771)

EME 810 Emergency Medicine (4 week rotation)

Specialty area: Emergency Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

4-week rotation. Exposure of the medical student to patients with complaints covering all age and all subspecialties who present to the Emergency Department. Will have first contact responsibility to perform a history and physical exam on each of his/her patients. Will discuss each case with an Emergency Department physician prior to ordering lab work, x-rays, medicines or consultation. Will discuss each case with an Emergency Department physician prior to patient's treatment and disposition. Will be actively involved in patient's education concerning discharge instruction (prescription, home care, etc.), and appropriate physician follow up.

ENDOCRINOLOGY (END)

END 810 Endocrinology (2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sutter Medical Center - Sacramento

Understand real life experiences of an endocrinologists and learn the clinical utilities and techniques related to endocrinology and metabolism. Students will 1) Describe the disease process in patients by integration of clinical findings (history and physical) with laboratory tests, 2) Explain the pathogenesis and pathophysiology of diseases of the pituitary, thyroid, parathyroid, adrenal, pancreas (endocrine), and reproductive organs, 3) Outline the function of the endocrine organ and explain the metabolism of their hormones and their effects on the body, 4) Develop adequate experience with the use of insulin, thyroid hormones, corticosteroids, and other related therapeutic agents, and 5) Develop adequate experience in endocrine related surgery and diagnostic procedures such as thyroid needle biopsy, vascular

ultrasound in diabetic patients, and bone mineral density testing.

FAMILY MEDICINE (FAM)

FAM 801-1 Family Medicine Sub-I

(2 – 4 week rotation)

Specialty area: Family Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Forest Hill Medical Center

Demonstrate an effective approach to the wellness visit for a patient of any age or gender. Develop the skills to acquire historical information, perform a physical examination and to communicate such findings with clinical reasoning skill. Demonstrate an effective approach to the hospitalized patient. Demonstrate an effective approach to the patient presenting to the emergency department.

FAM 801-2 Family Medicine Sub-I

(2 – 4 week rotation)

Specialty area: Family Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Western Sierra Medical Clinic

Understand the principles of family medicine care. Understand the role of Family Medicine physicians within any health care system. Demonstrate an effective approach to the evaluation and initial management of acute and chronic illnesses commonly seen in an outpatient office setting. Demonstrate an effective approach to the wellness visit for a patient of any age or gender. Develop the skills to acquire historical information, perform a physical examination and to communicate such findings with clinical reasoning skill.

FAM 801-3 Family Medicine Sub-I

(4 week rotation)

Specialty area: Family Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Hospital, Walnut Creek

Demonstrate an effective approach to the evaluation and initial management of acute and chronic illnesses commonly seen in an outpatient office setting. Demonstrate an effective approach to the wellness visit for a patient of any age or gender. Discuss the principles of family medicine care. Develop the skills to acquire historical information, perform a physical examination and to communicate such findings with clinical reasoning skill. Gather information, formulate reasonable differential diagnoses, and plans for initial evaluation and management of common presentation encountered in the outpatient office setting. Manage follow-up visit for patients presenting with one or more chronic illnesses. Demonstrate competency in the elicitation of the history and performance of the physical examination. Demonstrate competency in understanding evidence-based health promotion/disease prevention plans for patients of any age and either gender. Discuss the role of Family Medicine physicians within any health care system.

FAM 801-4 Family Medicine Sub-I

(4 week rotation)

Specialty area: Family Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Permanente, Antioch CA

Demonstrate an effective approach to the evaluation and initial management of acute and chronic illnesses commonly seen in an outpatient office setting. Demonstrate an effective approach to the wellness visit for a patient of any age or gender. Develop the skills to acquire historical information, perform a physical examination and to communicate such findings with clinical reasoning skill. Discuss the principles of family medicine care. Gather information, formulate reasonable differential diagnoses, and plans for initial evaluation and management of common presentation encountered in the outpatient office setting. Manage follow-up visit for patients presenting with one or more chronic illnesses. Demonstrate competency in the elicitation of the history and performance of the physical examination. Demonstrate competency in understanding evidence-based health promotion/disease prevention plans for patients of any age and either gender. Discuss the role of Family Medicine physicians within any health care system.

FAM 810 Family Medicine Elective (4 week rotation)

Specialty area: Family Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Elevation Physicians

In hospital and office-based contact with patients in a primary care setting, students develop: 1) adequate experience to competently approach and initially manage patients with acute and chronic medical problems that present to the outpatient office setting, 2) adequate experience to competently approach and conduct wellness visits for patients of any age, 3) adequate experience to proficiently gather and record patient data via history taking and the performance of physical examinations, and 4) proficient reasoning and communication skills relevant to the medical management of patients. Students attend weekly Family Medicine didactics. (Prerequisite: COM 701)

FAM 811 Outpatient Family Medicine Urban Setting

(6 week rotation)

Specialty area: Family Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Avicenna Medical Clinic, Toronto, ON

Demonstrate an effective approach to different types of patients to address patient-physician relationship in a greater detail. Perform various dermatologic and musculoskeletal procedures such as joint injections. Apply the required knowledge, skills, and attitude to develop an effective patient-physician rapport. Apply the required knowledge and skills to formulate accurate medical diagnoses and prioritize management options. Apply the required knowledge and skills to interpret diagnostic imaging studies, and perform different types of injections and dermatologic procedures routinely utilized in primary care.

GASTROENTEROLOGY (GST)

GST 810 Gastroenterology (4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Mercy San Juan Medical Center

4-week rotation. Students will gain experience and knowledge about the specialty of Gastroenterology and the conditions that specialists in this field are involved in diagnostic, management and treatment of. Demonstrate the pertinent aspects of the history and physical exam findings in patients with gastroenterological conditions. Explain the appropriate evaluative steps for patients with gastroenterological symptoms Illustrate knowledge about common gastroenterological diseases and their treatment and management.

GST 811 Gastroenterology (4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Morse

General Description: Students will gain experience and knowledge about the specialty of Gastroenterology and the conditions that specialists in this field are involved in diagnostic, management and treatment of. Demonstrate the pertinent aspects of the history and physical exam findings in patients with gastroenterological conditions. Explain the appropriate evaluative steps for patients with gastroenterological symptoms Illustrate knowledge about common gastroenterological diseases and their treatment and management.

HEMATOLOGY & ONCOLOGY (HEM)

HEM 810 Hematology and Oncology

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Hematology & Oncology Assoc. of N. Ca.

Approach to a patient with hemonc ailments, history taking, relevant physical exam, interpretation of common blood tests, reviewing smears if needed, discussing imaging results and making a sound provisional diagnosis. Outline the pertinent history and physical exam considerations in patients with hematologic and oncologic diseases. Demonstrate knowledge about patients with hematology and oncology related diseases. Interpret common blood test results and their indications Demonstrate knowledge about blood smear findings. Clinical experiences are predominately by seeing patients.

INFECTIOUS DISEASE (INF)

INF 810-01 Infectious Disease (4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

The student will be able to: 1. Understand the pathophysiology of common infectious diseases 2. Understand the clinical presentation and diagnostic approach to patients with Infectious Diseases. 3. Understand the approach to management and the use

of antimicrobials or antivirals in patients with infectious diseases. Students will learn how to identify, diagnose and treat various bacterial, viral, fungal infections, Infer how to diagnose and treat various orthopedic/bone infections, neutropenic fevers, bacteremias, Demonstrate an understanding of management of infections in an immunocompromised host, Infer how to manage and counsel HIV patients, Show an understanding of the principles behind antimicrobial stewardship.

INF 810-02 Infectious Diseases (2 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Sacramento and Morse Avenue

Students will learn common infectious diseases and how to treat them. Learn about HIV care. Understand the importance of antimicrobial stewardship and the judicious use of antimicrobials. To show an understanding of how to identify, diagnose and treat various bacterial, viral, fungal infections Infer how to diagnose and treat various orthopedic/bone infections, neutropenic fevers, bacteremias. Demonstrate an understanding of management of infections in an immunocompromised host. Infer how to manage and counsel HIV patients. Show an understanding of the principles behind antimicrobial stewardship. (Prerequisite: COM 711)

INF 812 California Northstate University College of Medicine M4 Infectious Diseases Clerkship

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Permanente Medical Center, Modesto

This Infectious Disease clerkship is scheduled with a preceptor who is an expert in this field. The student will experience the day to day activities of clinicians as he/she assists in the care of their patients. Exposure to patients in the clinic and hospital setting will give the student opportunity to practice interview and documentation skills. The student may be given the opportunity to participate in procedures as the preceptor determines his/her readiness. The curriculum for this rotation is based on nationally recognized curriculum modified for fourth year elective focus from the Clerkship Directors for Internal Medicine. Clinical rotations for California Northstate University College of Medicine are developed in a community training model. Community training involves placing students in a busy physician's practice with learning objectives that direct the student's focus. It is the student's job to learn rather than the physician's job to teach. Learning is "just in time" taking advantage of educational opportunities that present and augmenting learning opportunities with reading or modules to complete the objectives. In this model, students are expected to develop lifelong learning patterns of accessing appropriate resources rather than being told what to do and when to do it (prescriptive learning). The required texts will provide information necessary for successfully studying in this rotation, but some students may prefer suggested texts

or others. Preceptors may direct the student to their favorite texts or online resources.

INTERNAL MEDICINE (INT)

INT 801 Internal Medicine Sub-Internship

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Highland Hospital, Alameda Health System
Students will assume responsibilities quite similar to those of an intern, although with fewer patients. The student will be a member of a general medicine ward service consisting of an attending physician, residents, interns, and usually one "third year" student. Attending Rounds are made daily. Students will be able to gather a medical history, perform a physical examination, interpret common diagnostic tests, prioritize a differential diagnosis, and recommend and execute a management plan for common in-patient internal medicine patient presentations. Students will be able to organize and communicate their clinical thinking both in the form of written notes and oral presentations. Students will be able to communicate and collaborate in an inter-professional team of other healthcare providers, out-patient providers, consultants, RNs, and ancillary staff. Students will be able to communicate effectively with patients and caregivers. Students will transition patients safely across the healthcare system. (Prerequisite: COM 711)

INT 802 Inpatient Medicine Sub-Internship

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

The major goal of this sub-internship is to construct the clinical environment for the senior student to develop inpatient case management responsibilities in the broad field of internal medicine that will allow confident transition to resident level responsibilities in all disciplines.

INT 810-1 Palliative Medicine

(2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Permanente Modesto Medical Center

Variable credit based on duration of rotation. Palliative Medicine is an essential component of medical care for patient with a life limiting illness. This course provides medical students and residents a framework in which to effectively to acquire Palliative Care knowledge and skill sets necessary to care for serious ill patients and their families. Clinical experiences includes Inpatient and outpatient Palliative Care experiences, pain management, disclosing serious news, offering prognostic information, disease trajectory, addressing goals of care, conducting family conference, home visits (optional). Mandatory Palliative Care didactic lecture given by preceptor in the first week of the rotation. (Prerequisite: COM 711 or COM 701)

INT 810-2 Palliative Medicine

(2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Mercy San Juan Medical Center

Palliative Medicine is an essential component of medical care for patient with a life limiting illness. This course provides medical students and residents a framework in which to effectively to acquire Palliative Care knowledge and skill sets necessary to care for serious ill patients and their families. Demonstrate an effective approach to manage pain and other symptoms. Apply the principle of psychosocial and spiritual support in patient care. Demonstrate an effective approach to deliver serious news and explain prognostic information to the patients and their families. Apply disease trajectory and goals of care discussions in patient care. Demonstrate life care planning addressing complex family dynamics and caregiver support. Clinical experiences includes inpatient and outpatient Palliative Care experiences, pain management, disclosing serious news, offering prognostic information, disease trajectory, addressing goals of care, conducting family conference, home visits (optional).

INT 811 Introduction to Palliative Medicine

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Sacramento and Roseville Hospitals

4-week rotation. Course goals are to provide the medical student with a foundation in the principles of Palliative Medicine, particularly communication skills, pain and symptom management, and care of the dying patient. Students will demonstrate proper communication skills, particularly between providers and patients/families, the ability to organize and conduct a family meeting. Students will discover the basics of pain and symptom management and improve prognostic awareness. Students will perform the basic skills of care for the dying patient. Clinical experiences includes Hospital-based care, following patients on the in-patient Palliative Medicine team and Hospice-based care, spending several days with hospice care providers in the community.

INT 812 Palliative Medicine and Hospice Medicine

(2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Methodist Hospital of Southern California

Students will learn to integrate medical scientific methodology and practice with their patients psychosocial issues to develop plans to maximize patients and family quality of life. Integrate solutions and approaches to improve quality of life for a wide variety of challenging patients. Develop hands-on experience, including care clarification and explanation, with patients with difficult medical issues and patients who require end-of-life care. Clinical experiences includes Inpatient / out-patient (Home) rounds.

INT 813 Internal Medicine Elective

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Multiple

Students will assume responsibilities quite similar to those of an intern, although with fewer patients. The student will be a member of a general medicine ward service consisting of an attending physician, residents, interns, and usually one "third year" student. Attending Rounds are made daily. Demonstrate proficiency in history taking and physical examination, present it in a concise and well-organized format, and document the encounter in the EMR. Develop differential diagnoses of common presenting complaints. Demonstrate knowledge of the natural history of disease. Develop and Discuss evidence-based management plan and associated order plan. Demonstrate recognition and therapy of medical emergencies. Outline indications and interpretations of commonly ordered tests. Demonstrate proficiency with medical procedures such as nasogastric tube placement, venipuncture, lumbar puncture, thoracentesis, paracentesis, etc. Demonstrate medical record keeping (e.g., data collection and recording, appropriate format for writing consultations). Provide oral presentations of clinical cases. Demonstrate team approach and utilization of allied health personnel.

INT 814 Internal Medicine Elective

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Lincoln, Rhode Island

Demonstrate knowledge in the management of chronic disease. Outline recommended adult screening (colon cancer, breast cancer, diabetes, etc.). Demonstrate a strong physician-patient relationship for continuity of care. Demonstrate ability to administer care to a diverse patient population. Outline management of patients at all stages of adulthood (young adults, adult, and geriatric).

INT 815 Internal Medicine Outpatient Elective

(2 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Prima Medical Group, San Rafael, CA

Students will be able to gather a medical history, perform a physical examination, interpret common diagnostic tests, prioritize a differential diagnosis, and recommend and execute a management plan for common in-patient internal medicine patient presentations. Students will be able to organize and communicate their clinical thinking both in the form of written notes and oral presentations. Students will be able to communicate and collaborate in an inter-professional team of other healthcare providers, outpatient providers, consultants, RNs, and ancillary staff. Students will be able to communicate effectively with patients and caregivers. Students will transition patients safely across the healthcare system.

INT 816 Outpatient Internal Medicine Primary Care

(4 – 6 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Chinese Hospital and Clinics, Daly City

The major goal of this elective is to construct the clinical environment for the senior students to develop outpatient management responsibilities in the broad field of medicine that will allow confident transition to resident level responsibilities in all disciplines. The students will be directly supervised by faculty attending. Procedures required by the patient, will be performed by the student depending on experience and safety. After completing this course, the student should be able to: A. Perform a comprehensive history and physical exam for the purpose of evaluation and management in an outpatient clinical setting. B. Gather information, formulate differential diagnoses, and propose plans for the initial evaluation and management of patients with common presentations. C. Manage follow-up visits with patients having one or more common chronic diseases. D. Recognize acute care medical problems, as well as ethical and managed care issues E. Demonstrate competency in advanced elicitation of history, communication, physical examination, and critical thinking skills. F. Obtain basic technical skills suitable for the level of training G. Perform responsible medical care management decisions.

NEUROLOGY (NEU)

NEU 810 Clinical Neurosciences

(4 week rotation)

Specialty area: Neurology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): CNUCOM

Build the understanding of neurology through better understanding of more basic clinical neurosciences. 1) Apply and demonstrate basic neurosciences theory and principles in clinical application. 2) Utilize the literature and apply the knowledge for evidence based practice. 3) Apply self-directed learning methodologies to clinical practice. 4) Create and propose teaching sessions and tutorials for other medical students. Regular meeting with the preceptor to discuss learning and teaching activities. Regular self-directed learning activities with literature search and understanding.

NEU 811 Clinical Neurology Elective

(2 – 4 week rotation)

Specialty area: Neurology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): CNUCOM

Variable credit determined by duration of rotation. Student goals: Improve the understanding of neurology in the clinical setting, inpatient and/or ambulatory. Deepen and expand Neurology skills and knowledge acquired in 3rd year clerkship in areas of: history taking, physical exam, formulating differential diagnosis and management plan, improve skills in oral and written presentations, and procedural skills (when available). Will explore selected subspecialties in Neurology in more depth and continue to refine skills in

professionalism, communication and collaboration. Students acquire skills in patient management as part of the neurology team under supervision by the preceptor.

NEU 813 Pediatric Neurology Elective

(2 – 4 week rotation)

Specialty area: Neurology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Sacramento and Roseville

Clinical experience in Pediatric Neurology. Improve the understanding of neurology with expansion to Pediatric Neurology in the clinical setting, inpatient and/or ambulatory. Deepen and expand Neurology skills and knowledge acquired in 3rd year clerkship. Continue to refine skills in professionalism, communication and collaboration. Acquire skills in patient management as part of the neurology team under supervision by the preceptor. Focus of Clinical Pediatric Neurology experiences in both inpatient and outpatient settings. Different settings of Pediatric Neurology will be offered. Schedule will be customized by student request in available locations.

NEU 814 Pediatric Neurology Elective with Clinical Neurology /subspecialty option

(2 – 4 week rotation)

Specialty area: Neurology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Sacramento and Roseville

Clinical experience in Pediatric Neurology with the option to explore selected subspecialties/adult Neurology in more depth. Improve the understanding of neurology in the clinical setting, inpatient and/or ambulatory. Deepen and expand Neurology skills and knowledge acquired in 3rd year clerkship. Continue to refine skills in professionalism, communication and collaboration. Acquire skills in patient management as part of the neurology team under supervision by the preceptor. Focus of Clinical Pediatric Neurology experiences in both inpatient and outpatient settings with option of 1-2 weeks of Neurology/subspecialty rotations. Different areas of neurology will be offered primarily in pediatric neurology and but with the option of various Neurology/subspecialty (adult or pediatric) opportunities. Schedule will be customized by student request in available general and subspecialty areas.

NEUROSURGERY (NSG)

NSG 880S Neurosurgery

(4 week rotation)

Specialty area: Neurosurgery

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Mercy General Hospital, Sutter General Hospital

The student will be exposed to the breadth of neurosurgery pathologies such as brain tumors, vascular lesions, pain syndromes, spinal deformities, trauma of the brain or spine. The student will have the opportunity to work in the clinic as well as in the operating room and assist on neurosurgical operations. It is recommended that the student has a strong interest in the surgical specialties for this rotation. Students will learn to: 1)

Apply knowledge of neuroanatomy to describe etiopathogenesis and management of neurosurgical disorders. 2) Apply knowledge of neuroanatomy to interpret neuro-radiological findings. 3) Explain the mechanisms of traumatic brain injuries and outline their management. 4) Outline the clinical course including management of common neurosurgical problems including tumors, stroke, and spinal disease. Clinical experiences includes assisting in surgery, round in the hospitals, and evaluate patient in the clinic. Specialty Area(s): Neurology; Surgery.

OBSTETRICS GYNECOLOGY (OBG)

OBG 801 OB/GYN Sub-Internship

(4 week rotation)

Specialty area: OB/GYN

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Multiple

This is a course that exposes the student to general obstetrics and gynecology. The student will rotate through obstetrical services including labor and delivery, the gynecological services, and ambulatory clinics. There will be one call day. This rotation is designed to prime and prepare the student for an OBGYN internship. Medical students interested in an OBGYN residency are encouraged to experience this course.

OBG 810 Clinical OB/GYN Elective

(2 – 4 week rotation)

Specialty area: OB/GYN

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): CNUCOM

Variable credit determined by duration of rotation. Students will apply knowledge of basic & clinical sciences into medical practice; obtain and deliver a complete concise, clear and concise oral and written presentation of a patient's history and examination in a more complex setting; distinguish normal from abnormal findings and the ability to localize the likely sites of lesion in the Ob-Gyn system from available clinical information; utilize and interpret common tests used in diagnosing common condition in Ob-Gyn; Formulate a differential diagnosis based on clinical information and relevant history; Demonstrate a systematic approach to the diagnosis and management of common Ob-Gyn conditions and formulate a logical management plan; understand Ob-Gyn Subspecialties and their applications; and function as a "contributor" to the team managing the Ob-Gyn disorders. (Pre-requisite: COM 731)

OPHTHALMOLOGY (OPH)

OPH 810 Ophthalmology Clerkship

(4 week rotation)

Specialty area: Ophthalmology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Martel Eye Medical Group, Retinal Consultants

Students are expected to develop the basic skills of medical problem solving, basic science integration, case management, procedural competence, and professional

behavior as it pertains to the field of ophthalmology. They will accomplish this by: Refining history taking, Refining the physical examination, Developing a reasonable differential diagnosis, and Outlining an initial diagnostic and treatment plan. Clinical Experiences: Students will observe, participate, and manage in the care of clinical patients. Surgical Experiences: Students will observe and assist the preceptor in surgeries.

OPH 811 Ophthalmology

(4 week rotation)

Specialty area: Ophthalmology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: TBD

Students are expected to develop the basic skills of medical problem solving, basic science integration, case management, procedural competence, and professional behavior as it pertains to the field of ophthalmology. They will accomplish this by: Refining history taking, refining the physical examination, and developing a reasonable differential diagnosis. Interpret how to function as a physician in an Ophthalmology setting. Students will observe, participate, and manage in the care of clinical patients.

ORTHOPEDIC (ORT)

ORT 880S Ortho Spine

(4 week rotation)

Specialty area: Orthopedics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Office, operating room, hospital (Sutter General)

Students will see and evaluate patients in office, observe surgery, and make rounds. Develop experience in understanding medical and surgical options for patients with spine disorders. Evaluate patients with spine conditions. Understand decision making in operative and non-operative care.

ORT 881S Orthopedic Surgery

(4 week rotation)

Specialty area: Orthopedics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Office, Mercy San Juan Hospital, surgery center

4-week rotation. General observations and interactions with patients. Rounds in the hospital and observation in surgery. Extend knowledge in orthopedic anatomy and physical exam skills of the extremities. Build basic surgical skills. Clinical experiences includes Office, OR, rounding, surgery center.

ORT 882S Orthopedic and Podiatry

(4 week rotation)

Specialty area: Orthopedics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

The student will be able to develop skills in the Orthopedic Surgery Department by examining and supporting the residents and faculty. The student will be able to make use of the outpatient clinic, emergency room, ambulatory surgery, and the main operating

room. To show students to the field of orthopedics and it's various subspecialties and research opportunities. To demonstrate a general feel for the training involved in Orthopedics. To show basic orthopedic skills such as x-ray interpretation, splinting and casting techniques, suturing techniques, physical exam. To extend the student knowledge of anatomy as it applies to musculoskeletal conditions, and to introduce student to orthopedic treatments and the medical decision making process.

OTOLARYNGOLOGY-ENT (OTO)

OTO 813 Otolaryngology Elective

(4 week rotation)

Specialty area: Otolaryngology, ENT

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sacramento, Roseville, & Carmichael.

Develop an understanding of the diagnosis and treatment of many common otolaryngology diseases. Students will learn to: Improve examination skills, Develop recognition of head and neck pathology. Demonstrate the understanding of when to refer for specialty opinion. Clinical experiences includes on-site experience at one of three SacENT offices as well as surgery centers and hospitals in Sacramento and Roseville areas.

OTO 814 Pediatric Otolaryngology

(2 week rotation)

Specialty area: Otolaryngology, ENT

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Roseville Women and Children's Center

Two week rotation includes the analyzing of pediatric otolaryngology problems presented to specialist for diagnosis and treatment. The student develop skills in the clinic, hospital and operating room. Learn the basic anatomy and surgical anatomy of the head and neck, including surface and internal anatomy. Learn the embryologic foundations of pediatric otolaryngologic disorders. Recognize signs and symptoms of pediatric otolaryngologic disorders. Use appropriate tests and evaluation methods for pediatric otolaryngologic disorders. Complete a comprehensive history and physical examination. Develop a diagnosis for pediatric otolaryngologic disorders. Demonstrate and describe the surgical and nonsurgical management of pediatric otolaryngologic disorders. Student will accompany physician and participate in clinic in the evaluation of head and neck surgery patients.

OTO 881S Otolaryngology – Head and Neck Surgery

(4 week rotation)

Specialty area: Otolaryngology, ENT

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Modesto and Stockton

The objective of this course is to give a broad exposure to the clinical and surgical aspects of otolaryngology. Students will become acquainted with the experience of outpatient office, operating room care, and overall integrated care between patients, general otolaryngologists, and other health care providers

including primary care, audiology, and speech therapy. In the office, students will have the opportunity to obtain focused history, perform a complete head and neck exam, formulate differential diagnosis, and management plan. In the operating room, students will perform chart reviews prior to surgery and be knowledgeable about relevant surgical anatomy and treatment options for common surgical disorders like otitis media, sinusitis, pediatric obstructive sleep apnea, and thyroid disorders. At the end of the rotation, the student will be expected to present a topic that was encountered during the rotation. The course setting includes Kaiser Stockton Medical offices (with a potential opportunity for facial plastics exposure), Modesto and Manteca Kaiser Hospitals. The hours may potentially run from 7 AM to 7 PM without overnight call. Clinical experiences includes Outpatient clinic, outpatient clinic procedures, operating room, audiology, lunch sessions, interdepartmental monthly meetings (Head and Neck surgery, audiology, and speech therapy). (Pre-requisite: COM 761)

OTO 882S Head and Neck Surgery

(4 week rotation)

Specialty area: Otolaryngology, ENT

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Roseville

Understanding common head and neck pathologies and management strategies. Develop competency with the head and neck exam and identification of normal anatomy. Demonstrate understanding of head and neck surgical anatomy. Show familiarity with common head and neck pathology and basic management strategies. Demonstrate familiarity with common head and neck emergencies basic management strategies. Students will work with staff surgeons in clinic and operating room

PATHOLOGY (PTH)

PTH 810 Pathology

(4 week rotation)

Specialty area: Pathology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Hospital laboratory

Students will understand the role of pathology, appropriate utilization of lab tests. Understand the behind the scenes work that is involved in clinical laboratory result reporting. Demonstrate the functions of a community pathologist: Anatomic pathology: frozen sections, intraoperative consultation, hospital slide review and special studies, gross examination of surgical specimens. Clinical lab management: take part in the hematology, blood bank, chemistry, attend hospital lab meetings as appropriate, lab management. The field of pathology differs from the more traditional fields of medicine. The rotation will be modified to accommodate for the interest of the student in the field of pathology. Patient care will include gross examination of surgical specimens, intraoperative consultations and slide review of hospital cases. These results will be correlated with the clinical information.

PEDIATRICS (PED)

PED 801 Pediatric Sub-Internship

(4 week rotation)

Specialty area: Pediatrics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Multiple

The medical students will function as interns. Each student will meet with Dr. Khaira on the first day to determine how the rotation is to be structured with educational goals and objective. Rotations are based on the individual interests and needs of the student. Students will care for patients of all socioeconomic backgrounds and with a mix of pathology ranging from bread and butter problems to tertiary care inpatient pediatrics.

PEDS 810 Pediatric Cardiology

(4 week rotation)

Specialty area: Pediatrics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Multiple

Develop understanding of cardiovascular physiology and pathophysiology of both congenital and acquired heart disease in outpatient and inpatient environments. Gain exposure to both noninvasive and invasive methods used in diagnosing and treating congenital and acquired heart disease in the pediatric population. Develop skills in obtaining a history and performing a physical examination focused on the cardiovascular system. Students will develop skills in performing a physical examination focused on the cardiovascular system, including feeding patterns, respiratory assessment and evaluation of perfusion and auscultation of innocent and pathologic murmurs. Interpretation of electrocardiograms and chest x-rays. Gain understanding of the utility of echocardiography, cardiac catheterization, stress test, MRI and CT imaging modality in the assessment of congenital and acquired pediatric cardiovascular disease. Learn approaches to the evaluation of chest pain, palpitations, dizziness and syncope. Develop skills in the assessment of newborns, infants and children with suspected congenital or acquired cardiovascular disease. Recognize signs and symptoms associated with congestive.

PED 815 Pediatric Intensive and Inpatient Care

(4 week rotation)

Specialty area: Pediatrics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Multiple

Provide students a broad exposure and experience in managing or participating in the care of hospitalized pediatric patients in both pediatric critical care and/or inpatient units at an accredited Children's Hospital. Observe or participate in the management of hospitalized infants, children adolescents, and young adults. Develop the experience required for medical management issues unique to the pediatric population. Observe/participate in procedures commonly required in the medical management of pediatric inpatients. Students will be assigned to PICU at Sutter Medical

Center's Women and Children's Center during their 4 week rotation.

PED 816 Medicine – Pediatrics

(4 week rotation)

Specialty area: Pediatrics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: San Diego Internal Medicine and Pediatrics Associates

To gain exposure to the combined field of internal medicine and pediatrics. Develop clinical experience through in a setting that is unique to internal and pediatric medicine which is proctored by a physician who is board certified in both internal medicine pediatrics. Assume a role where students are responsible for making initial evaluations, carrying out diagnostic procedures and provide ongoing management of patients. Clinical experiences includes history-taking, physical examination, diagnostic procedures and patient management.

PED 817 Pediatric Hematology-Oncology

(4 week rotation)

Specialty area: Pediatrics

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: San Diego Internal Medicine and Pediatrics Associates

To gain exposure to the field of hematology-oncology. Provides exposure in a setting that is unique to pediatric hematology oncology which is proctored by a physician who has specialized in the field. The student should assume a role where they are responsible for making initial evaluations, carrying out diagnostic procedures and provide ongoing management of patients.

PHYSICAL MEDICINE (PMR)

PMR 810-1 Physical Medicine and Rehabilitation PM&R

(4 week rotation)

Specialty area: PM&R

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Sacramento and Roseville

This rotation allows students to understand the diversity and scope of PM&R practice (neurologic rehab, musculoskeletal, spine, interventional procedures, electro diagnostic tests, inpatient and outpatient care); Understand basic principles involved in the above. Clinical experiences includes: 1) Spine clinic appointments (Kaiser Sacramento and Roseville); Injection Risk Orientation (Kaiser Roseville); and outpatient physical therapy appointments, 2) Interventional spine procedures – fluoroscopy and ultrasound-guided (Kaiser Ros), 3) Electro diagnostic clinic appointments (Kaiser Sac, Ros), 4) Neurorehab clinic appointments (Kaiser Sac, Ros); amputee clinic; and outpatient physical, occupational, speech therapy appointments, and 5) Hospital consultations, neuro-ICU and stroke rounds, inpatient therapy sessions (Kaiser Sac).

PMR 810-2 Physical Medicine and Rehabilitation (PM&R)

(4 week rotation)

Specialty area: PM&R

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Sacramento and Roseville

Understand the diversity and scope of PM&R practice (neurologic rehab, musculoskeletal, spine, interventional procedures, electro diagnostic tests, inpatient and outpatient care). Understand basic principles involved in the above (see Learning Objectives, below). Demonstrate competency in basic neurologic, spine and functional examinations. Complete a history, physical exam and functional assessment on individuals with disabilities. Develop strategies to reduce the risk of secondary complications for the disabled individual (contractures, skin breakdown, DVT, etc). Learn the process of adaptation to disability and reintegration of the disabled patient into the family, community and workplace. Learn basic spine diagnoses, spine exam and management/treatment options. Learn about role of electro diagnostic tests in the medical workup process. Spine clinic appointments (Kaiser Sacramento and Roseville); Injection Risk Orientation (Kaiser Roseville); and outpatient physical therapy appointments. Interventional spine procedures – fluoroscopy and ultrasound-guided (Kaiser Ros). Electro diagnostic clinic appointments (Kaiser Sac, Ros). Neurorehab clinic appointments (Kaiser Sac, Ros); amputee clinic; and outpatient physical, occupational, speech therapy appointments. Hospital consultations, neuro-ICU and stroke rounds, inpatient therapy sessions (Kaiser Sac).

PLASTIC SURGERY (PLS)

PLS 801S UC Davis Plastic Surgery Acting Internship

(4 week rotation)

Specialty area: Plastic Surgery

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): UC Davis Medical Center

Gain a greater appreciation of Plastic Surgery, as the surgical specialty that restores, reconstructs, or alters the human body in response to congenital or acquired deformities following trauma, weight changes, or the natural aging process. It encompasses many specialty areas including craniofacial, hand, microsurgery, breast and aesthetic surgery. Elective is flexible with primary emphasis on reconstructive and aesthetic surgery at the University Hospital with opportunities for assisting in the operating room. The rotation also includes Trauma call to provide experience with the evaluation and management of maxillofacial and hand trauma with opportunities for suturing of lacerations as well as closed reduction and splinting of common hand fractures.

PLS 880S Plastic Surgery

(2 – 4 week rotation)

Specialty area: Plastic Surgery

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): AHMC San Gabriel Valley Hospital

The specialty of plastic and reconstructive surgery is that branch of surgery concerned with the restoration of normal form and function. It is a varied specialty

involving adults and children and encompassing a wide range of conditions in different parts of the body. A major proportion of the workload involves take part in urgent or emergency cases including: Hand trauma, Burns and scalds, Soft tissue injuries involving face, trunk or limbs. Elective surgery includes demonstration of the following major areas: Head and neck. This includes excisional and reconstructive surgery for congenital and acquired abnormalities, and for malignancy involving the face and mouth. Cleft lip and palate and other craniofacial abnormalities. Breast: including surgery for reconstruction, reduction and augmentation. Hand and upper limb: including congenital and acquired conditions. Skin and soft tissue tumors. Congenital and acquired deformities of the trunk and urogenital system. Aesthetic or cosmetic surgery. One of the most interesting aspects of the specialty is the frequency with which plastic surgeons relate with surgeons from other specialties such as general surgery, orthopedics, otorhinolaryngology, and maxillofacial surgery. In these cases, the reconstructive techniques that plastic surgeons have at their disposal are recognized. The specialty is also closely associated with aesthetic surgery where body parts are surgically altered to bring about an improvement in appearance.

PSYCHIATRY (PSY-M)

PSY-M 810 Psychiatry Elective (2 – 4 week rotation)

Specialty area: Psychiatry

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Students should learn common psychiatric conditions such as Major Depressive Disorder, Generalized Anxiety Disorder, Bipolar Disorder, and schizophrenia. Students will be expected to present cases and develop a treatment plan as well as interview patients. Time will be spent in outpatient psychiatry. Daily interaction with preceptor as well as clinical presentation on topic of preceptor's choosing. To practice taking a psychiatric history and developing a treatment plan in the outpatient setting. Conducting a psychiatric history. Develop a treatment plan as well as the basis for psychiatric admission. Being able to recognize the difference between neurological and psychiatric causes. Outpatient and hospital inpatient clinical experiences.

PSY-M 811 Psychiatry Elective (4 week rotation)

Specialty area: Psychiatry

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sierra Vista Hospital

The focus of this elective will be on interviewing skills and documentation. Specifically for fourth year, the focus would be on independence and autonomy. This would include researching unique aspects of the student's patient's presentation, and presenting/utilizing that information directly for patient care. There would be more of an expectation for the independent treatment planning, as well as independent interactions with case management and patient's families. Daily "check-in" with the student at the end of the day rather than throughout, and there would be more critical discussion regarding the rationale behind

clinical conclusions and treatment decisions. Furthermore, if there are third year student on rotation, as well, I would delegate some teaching responsibilities to the fourth year student.

PSY-M 830 Child and Adolescent Psychiatry (CAP)

(4 week rotation)

Specialty area: Psychiatry

Location(s): South Beach Psychiatric Center, Staten Island, NY

In psychiatry, child and adolescent patients differ significantly from adults in many ways, such as being in various stages of neurocognitive and general development. The goal of the course is primarily to introduce and develop skills and knowledge related to psychiatric treatment in these patients including topics such as: Diagnosis of psychiatric illness in child and adolescent patients, including differentiating variations in development and behavior from pathology. Interview and collection of collateral. How the developmental, family, environment (home, school, etc.) and other factors contribute to and interact with mental illness in children and its treatment, as well as potentially confound or confuse diagnosis. Challenges and subtleties of treatment of the patient population. For example, management of the milieu of the patient and their illness. Psychopharmacological treatment of the child and adolescent patients. For instance, idiosyncratic drug reactions in the population such as suicidal ideation caused by treatment with SSRIs. Psychotherapeutic treatment of CAP patients. Intersections of CAP psychiatry with law and society. Student will observe and carry out interview of patients and family, write notes and orally present cases (including histories, MSE, formulation, assessment and plan) to preceptor.

PULMONARY (PUL)

PUL 801 Pulmonary & Critical Care Medicine Sub-Internship

(2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Sutter Sacramento/Roseville Med/Mercy San Joan

This rotation offers an opportunity for a 4th-year student to work jointly with a faculty attending to evaluate and manage critically ill medical and surgical patients. Typical patient diagnoses include myocardial infarction and cardiac arrest, acute respiratory failure (asthma, COPD, pneumonia, ARDS), delirium and coma, stroke, severe sepsis, toxic ingestions, diabetic ketoacidosis, cardiogenic and septic shock, renal and hepatic failure, and post-operative co-management. A comprehensive evidence-based management approach based in physiology will be taught. Students will be responsible for patient evaluations and notes and will progress to performance of diagnostic and therapeutic procedures as appropriate. Students will become familiar with basic mechanical ventilator management and arterial blood gas interpretation, and the value of a multi-professional team approach to the care of the critically ill.

PUL 810 Pulmonary & Critical Care

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

This rotation offers an opportunity for a 4th-year student to work jointly with a faculty attending to evaluate and manage critically ill medical and surgical patients. Typical patient diagnoses include myocardial infarction and cardiac arrest, acute respiratory failure (asthma, COPD, pneumonia, ARDS), delirium and coma, stroke, severe sepsis, toxic ingestions, diabetic ketoacidosis, cardiogenic and septic shock, renal and hepatic failure, and post-operative co-management. A comprehensive evidence-based management approach based in physiology will be taught. Students will be responsible for patient evaluations and notes and will progress to performance of diagnostic and therapeutic procedures as appropriate. Students will become familiar with basic mechanical ventilator management and arterial blood gas interpretation, and the value of a multi-professional team approach to the care of the critically ill.

PUL 811 Pulmonary & Critical Medicine

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Simi Valley Hospital & Los Robles Regional Medical Center

Students will learn how to manage respiratory diseases both inpatient and outpatient. Students will build the skill to manage COPD, asthma, pneumonia and the skill to manage critical patients in the ICU. Students manages sepsis, stroke, and many other critical illnesses in the ICU.

PUL 812 Pulmonary & Critical Care & Sleep Medicine

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Mercy san Juan Medical Center and Mercy Sleep Lab

This rotation offers an opportunity for a 4th-year student to work jointly with a faculty attending to evaluate and manage critically ill medical and surgical patients. Typical patient diagnoses include myocardial infarction and cardiac arrest, acute respiratory failure (asthma, COPD, pneumonia, ARDS), delirium and coma, stroke, severe sepsis, toxic ingestions, diabetic ketoacidosis, cardiogenic and septic shock, renal and hepatic failure, and post-operative co-management. A comprehensive evidence-based management approach based in physiology will be taught. Students will be responsible for patient evaluations and notes and will progress to performance of diagnostic and therapeutic procedures as appropriate. Students will become familiar with basic mechanical ventilator management and arterial blood gas interpretation, and the value of a multi-professional team approach to the care of the critically ill.

RADIOLOGY/NUCLEAR MEDICINE

(RAD)

RAD 810-1 Radiology

(4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Students will gain experience and knowledge about the specialty of Radiology, its indications, interpretations, and common interpretation errors. After the 4-week rotation through various sections of the department, student(s) should be able to: 1) Explain the basic principles of radiography and identify basic daily routine clinical radiographic examinations and interpretation of common diseases-pathologies. 2) Explain the basic principles of computed tomography (CT) and magnetic resonance imaging (MRI) its daily routine clinical examinations including appropriate indications and grasp basic cross-sectional anatomy as well as common pathologic conditions/diseases. 3) Explain the basic principles of fluoroscopy and basic daily routine clinical fluoroscopic examinations and procedures. 4) Explain the basic principles of nuclear medicine and its daily routine clinical examinations and interpretation. 5) Explain the basic principles of interventional radiography and its daily routine clinical examinations and procedures.

RAD 810-2 Radiology

(4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Alhambra Hospital, Los Angeles, CA

Students will gain experience and knowledge about the specialty of Radiology; indications, interpretations, and common interpretation errors. After the 4-week rotation through various sections of the department, student(s) should be able to: 1. Explain the basic principles of radiography and identify basic daily routine clinical radiographic examination and interpretation of common diseases-pathologies. 2. Explain the basic principles of computed tomography (CT) and magnetic resonance imaging (MRI). Its daily routine clinical examinations including appropriate indications and grasp basic cross-sectional anatomy as well as common pathologic conditions/diseases. 3. Explain the basic principles of fluoroscopy and basic daily routine clinical fluoroscopic examinations and procedures. 4. Explain the basic principles of nuclear medicine as its daily routine clinical examination and interpretation. 5. Explain the basic principles of interventional radiography and its daily routine clinical examinations and procedures.

RAD 811-01 Interventional Radiology

(4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser South Sacramento

Students will understand the basic technical principles of image-guided procedures using fluoroscopy, ultrasound, and CT and application into intervention in

organ systems. Students are exposed to a wide range of procedures performed by a practicing Interventional Radiologist. Students will understand the clinical principles of interventional radiography as applied to disease processes and importance of active patient management. Students will develop mastery of arterial, venous anatomy, mastery of Seldinger technique, advanced understanding of interventional oncology especially in treatment of hepatocellular carcinoma, and understanding of clinical role of IR in caring for patients in the outpatient setting. Students will perform the familiarity with use of ultrasound and ultrasound guided needle access, use of guide wires, catheters, and micro catheter systems. Students will demonstrate familiarity with angioplasty equipment, stents, and embolic agents, the understanding of clinical role of IR in caring for the critically ill patient, and familiarity with venous and arterial interventions.

RAD 811-02 Interventional Radiology

(4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): AHMC Whittier Hospital

Designed to provide the student with a better understanding of the central role of interventional radiology in the evaluation and management of patients through participation in reading room readouts, radiology call, case presentations, interactive labs, and observation of the various imaging modalities and procedures. Students will construct the appropriate sequencing of exams and the limitations of diagnostic imaging tests, including cost-effectiveness of imaging studies. Apply basic interpretive skills to evaluate common imaging studies – predominantly plain films and CT. Take part in imaging interpretation, including basic study identification, recognition of normal radiographic and cross-sectional anatomy, and common pathology as depicted on common studies. Utilize the PACS system to retrieve and review images.

RAD 812 In-house Radiology Elective

(4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: CNUCOM

Students will understand the basics and important normal and abnormal imaging findings in X-ray, CT, MRI and other imaging modalities. Clinical experience includes imaging case discussions and presentations. Perform, document, and present complete history and physical exam and interpret laboratory, radiologic, and other relevant data to develop a differential diagnosis, assessment and evidence-based management plan, that includes procedural or operative management if indicated. Perform and document a concise and well-organized daily progress note that includes relevant laboratory, radiologic data and incorporates pertinent 24-hr events. Describe the management of common disorders in the core discipline, including procedures and operative management if indicated. Research the clinical condition of a given patient with appropriate evaluation of literature and other available resources.

Recognize patients who are critically ill or require emergent care and develop appropriate initial steps of care for stabilization Demonstrate sensitivity to the concerns of patients and their families regarding the patient's illness and communicate plans of care with compassion and empathy (including benefits, side-effects of therapy, quality of life and end-of-life issues).

RAD 816 Nuclear Medicine, Molecular Imaging and Theranostics

(2 – 4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Hospital-Roseville, Sacramento

Students will demonstrate knowledge of Nuclear Medicine items which pertain to USMLE Step 2 and the ability to tackle what is the next step imaging test asked on standardized examinations. Students will perform the ability to manage hyperthyroid patients and gather a focused history on patients with Hyperthyroidism. Students will be able to describe the appropriate utilization of cardiac imaging guidelines and Fleishner criteria for management of pulmonary nodules (both solid and sub solid). Students will show knowledge of basics of PET, molecular imaging and theranostics. (Pre-requisite: COM 711; COM 761)

RAD 817 Dignity Hospital Radiology

(2 – 4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Mercy San Juan Medical Center

Understand the role of Diagnostic Imaging and Interventional Radiology in patient management. For those considering a career in Radiology, acquire insight on what the practice of Radiology is all about. Learn an approach for examining their patient's imaging studies as a non-radiologist. Learn how to image efficiently and use Radiologic consultation as a resource. Learn the hazards of exposure to ionizing Radiation for diagnostic purposes. Learn the breath of Interventional Radiological procedures available to solve clinical problems. Learn the components of a Radiologic report and what can and cannot be expected. Shadow the activities of one of the 4 on site Radiologists. The student will be given the flexibility to choose which Radiologist to work with depending on their specific interests. Switching from one to the other during the day is acceptable if not encouraged.

RAD 818 Neuroradiology

(4 week rotation)

Specialty area: Radiology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser and others

Students will understand and learn neuroradiology as an extension of general radiology. Students will apply and understand neuroanatomy through neuroimaging, understand theories and practice of different neuroradiological entities. Students will perform and understand neuropathology through neuroimaging and Analyze cost-effectiveness of different neuroimaging

entities. Clinical experiences includes regular learning and interaction on clinical sites with the preceptors.

RENAL

REN 810-1 Nephrology

(2 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Medical Center Roseville

Basics of Renal disease, Acute Kidney Injury, Chronic Kidney Disease, Hypertension, Electrolyte abnormalities and introduction to dialysis and kidney transplant. Make use of above topics to achieve a sound knowledge in renal physiology. Clinical experiences includes office and hospital patients.

REN 810-2 Nephrology

(2 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Modesto Kidney Medical Group, Modesto
Basics of Renal disease, Acute Kidney Injury, Chronic Kidney Disease, Hypertension, Electrolyte abnormalities and introduction to dialysis and kidney transplant. Make use of above topics to achieve a sound knowledge in renal physiology. Clinical experiences includes office and hospital patients.

REN 810-3 Nephrology

(2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Capital Nephrology Medical Group

Basics of Renal disease, Acute Kidney Injury, Chronic Kidney Disease, Hypertension, Electrolyte abnormalities and introduction to dialysis and kidney transplant. Make use of above topics to achieve a sound knowledge in renal physiology. Clinical experiences includes office and hospital patients.

RHEUMATOLOGY (RHE)

RHE 810-01 Rheumatology

(2 – 4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Roseville Rheumatologists, Roseville, CA

Rheumatology is a study of autoimmune disease and in this specialty students would learn clinical signs and symptoms of some of the most common rheumatologic autoimmune diseases like Rheumatoid arthritis, Lupus, Psoriatic Arthritis, Ankylosing spondylitis and various other autoimmune disease. Evaluate history and physical examination specific for rheumatologic disease process. Maximize basic knowledge about most common disease like Rheumatoid arthritis, Osteoarthritis, lupus and gout.

RHE 810-02 Rheumatology

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Roseville Rheumatologists, Roseville, CA

Rheumatology is a study of autoimmune disease and in this specialty students would learn clinical signs and symptoms of some of the most common rheumatologic autoimmune diseases like Rheumatoid arthritis, Lupus, Psoriatic Arthritis, Ankylosing spondylitis and various other autoimmune disease. Students will demonstrate how they examine and analyze patients with rheumatic diseases. When appropriate they should analyze laboratory assessment and radiographic characteristics of the diseases. Clinical experiences includes seeing patients with history and physical exam followed by review of labs and images with further discussion.

SPORTS MEDICINE (SPM)

SPM 814 First Degree Care Sports Medicine

(4 week rotation)

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Rocklin Family Practice and Sports Medicine

Improve and acquire high skills in MSK exams / OX / Injections / Fracture & concussion management / XRAY interpretation. Students will: demonstrate and describe basic structures and functioning of body joints, demonstrate proper injections technique, observe and manage fractures and concussions, and acquire high skills in XRAY interpretation.

SPM 815 Sports Medicine

(2 – 6 week rotation)

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Kaiser Permanente Sports Medicine Center, Sacramento

Apply acquired skills of clinical exposure to most common acute sports injuries, initial evaluation and management and return to play consideration when relevant. Apply the required medical knowledge and skills to examine large joints. Discover and demonstrate an appropriate sports concussion evaluation. Apply acquired skills of clinical exposure to appropriate x-rays evaluation and interpretation.

SURGERY (SUR)

SUR 801 Surgery Sub-Internship

(4 week rotation)

Specialty area: Surgery

Sponsor(s): Dept. of Med Ed. & Affiliated Institutions

Locations: Multiple

Students will take a higher level of responsibility for the evaluation and management of various acute surgical disorders. Students are expected to attend and participate in all scheduled educational activities at the host institution. Students will learn how to perform comprehensive history and physical examinations in a timely manner and will gain experience in generating differential diagnoses, assessments, and diagnostic and treatment plans at a level similar to a person doing a surgery internship. They will have a greater opportunity to hone their surgical skills in the OR as well as hone skills in the pre-surgical evaluation of patients and post-operative and their management.

SUR 881S Head and Neck Surgery

(4 week rotation)

Specialty area: Otolaryngology

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Kaiser Roseville

Designed to provide the student with a better understanding common head and neck pathologies and management strategies. Develop competency with the head and neck exam and identification of normal anatomy. Demonstrate understanding of head and neck surgical anatomy. Show familiarity with common head and neck pathology and basic management strategies. Demonstrate familiarity with common head and neck emergencies basic management strategies.

SUR 882S Trauma Surgery

(4 week rotation)

Specialty area: Surgery

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Location(s): Mercy San Juan Hospital

The Trauma Team responds to trauma resuscitations and is involved with immediate evaluation and management of critically injured patients in the emergency department. Students should demonstrate the initial evaluation and management of the trauma patient and basic principles of resuscitation in the emergency department and in the ICU/trauma ward. The student will also demonstrate the familiarity with physiology, management and outcome of multiple organ dysfunctions. They will gain exposure to procedure: central access, chest tube placement, wound debridement, tracheostomies, laceration repairs, etc. They will be make use of the exposure to complex and difficult decision making involving the injured patient.

UROLOGY (INTUR)

INTUR 810 Urology Elective

(4 week rotation)

Specialty area: Internal Medicine

Sponsor(s): Dept. of Med. Ed. & Affiliated Institutions

Locations: Roseville, CA

Obtain Informed consent for urological procedures. Demonstrate a working knowledge of the preoperative preparation and postoperative management of urological patients, including discharge planning. Demonstrate knowledge of various urological procedures, including their indications, non-surgical alternatives, risks, benefits and their expected outcomes. Demonstrate an advanced understanding of the performance of common urological procedures and participate actively in their performance. Demonstrate a working knowledge of basic surgical techniques, including patient positioning, suturing and assisting. Develop a knowledge of the common quality initiatives (I.e. deep vein thrombosis, infection that promote improved patient outcomes. and patient safety protocols).

INTERDISCIPLINARY ELECTIVES

COM 901 Honors Medical Research (1 – 6 cr)

This elective research course is designed to enhance student's skills and interest in an academic career. Students will focus on developing a research question and will conduct a review of current literature to assist with the answering or further development of that question. The course will allow students to hone their analytical and investigative skills by participating in an active research project under a faculty mentor to produce usable data sets, public presentations, and abstracts suitable for publication. (Prerequisites: COM623)

COM 903 Being a Leader (2 cr)

Given the complex and demanding environment of healthcare, effective leadership is often required to meet these challenges. This course is designed to provide you with tools to give you access to being who you need to be, to be a leader, and to exercise leadership effectively as you encounter each of these challenges.

This course is a leadership laboratory in which you will discover that leadership does not always mean a position, a title, time, money, influence, or any of the traits typically "required" to be a leader or produce the results of a leader. Instead of more knowledge about leadership, you will gain access to actually begin a leader and effectively exercising leadership as your natural self-expression, in any situation and under any circumstances. During the course your current conventional thoughts will be challenged, new ways of thinking will emerge, and you will leave with new actions to create even greater success in the areas of life and leadership that matter most to you. The purpose of this course is to inquire into the meaning and being of leader and leadership in order to empower each of us to be leaders in our lives, communities, and societies. It is not an academic inquiry to theories, models, and case studies about leadership. The promise of this course is that, if you participate fully, you will leave the course being a leader and exercising leadership effectively as your natural self-expression. By the end of the semester, these terms will be clear to you and you will be a leader in ways you never conceived of before. (Prerequisites: M1-M4 in good standing; Repeatable for max of 4 credits)

COM 904 The Healers Art (0.5 cr)

The Healers Art course is an elective course consisting of 5 three-hour sessions. It is available to all CNU COM students. The course will be offered 1-2 times per year in the Fall and/or Spring semester. Each session will have both large group presentations and small group discussions. The small groups will consist of 1 faculty member and 5 students, and students will remain with the same small group (including faculty member) throughout the course. The maximum number of students will be based on faculty available for small group facilitation for a particular course and will be 5 times the number of faculty available (1:5 ratio faculty to students). The Healers Art course is a defined curriculum

created in 1991 by Dr. Rachel Remen (Professor, UCSF School of Medicine) is currently being taught in over 90 medical schools. The purpose of the course is to explore the human dimension of health care including learning self-care strategies and recognizing the value of service. Topics covered will include defining an individual's purpose and commitment in medicine, tools to deal with grief and loss, recognizing awe and mystery in the practice of medicine, and open dialogue about mission and service. The course and its small group discussions offer an opportunity for open dialogue, depth of discussion and interaction with faculty that is unique and not available in other areas of the curriculum. (Prerequisites: M1-M4 in good standing)

COM 905 Mindfulness-Based Stress Reduction (1 cr)

This course is a Phase A elective course consisting of 9 two-hour sessions and a one-hour orientation which can be taken either as an M1 or M2. Each session will include a formal 30-45 minute meditation practice as well as other mindfulness exercises and facilitated group discussions, including a discussion of research articles on the top of mindfulness. This elective course is modeled after the MBSR program created by Dr. Jon Kabat-Zinn at the University of Massachusetts. As described by Dr. Kabat-Zinn, mindfulness is "paying attention on purpose" and remaining in the present in a nonjudgmental way. Research has shown that participation in an MBSR course can lead to reductions in chronic pain, anxiety, depression, headaches, and improved quality of life and prevent fatigue and burnout in physicians. By participating in this MBSR course, students will be introduced to the idea of mindfulness as a tool to improve their lives as future physicians as well as knowledge base that can be shared with future colleagues and patients who may benefit from the program. The course requires at least 8 attendees with a maximum of 30 attendees. The course will be offered 1-2 times per year in the Fall and/or Spring semester. (Prerequisite: M1 or M2 in good standing)

COM 906 Military Officer Training (Variable Credit)

Varies slightly by branch of service. For Army: This course will last 6 weeks in duration and will require duty through weekends. 1. To obtain information about the AMEDD Basic Officer Leader Course, go to <http://www.cs.amedd.army.mil/BOLC/index.htm>. This web site contains key information for students to be successful at BOLC, to include: frequently asked questions (FAQ) page, field packing lists, recommended uniform items, and key dates during the course. 2. Officers will be assigned to A Company, 187th Medical Battalion, Fort Sam Houston, Texas. See A Company's website: <http://www.cs.amedd.army.mil/BOLC>. This website contains the Commander's welcome letter, frequently asked questions, and command policy

letters. Check it frequently since the information is often updated. 3. Officers are to bring their uniforms to Fort Sam Houston. There will be an opportunity to purchase more uniforms while attending the course. 4. It is highly recommended that officers bring computer/laptop and printer, as many homework assignments require the use of a computer and printer. There are computer labs in the AMEDD Center and School, but the hours may be limited. **CRITICAL TASK:** Students are required to meet all course graduation requirements and **WILL SPECIFICALLY MEET ALL STANDARDS FOR THE FOLLOWING TASKS:** four-man litter carry.

COM 907 Endocrinology Teaching Assistant (4 weeks)

Location: CNU COM

Students will serve as facilitators for all SILS and CCBL sessions (2 hrs. each). This involves guiding M2's through case analysis as well as directing M2's to choose CCBL learning objectives which are chosen by the endocrine faculty as ideal.

HLT 810 Wellness – Leadership, Healers Art, Mindfulness and Compassionate Conversations (4 cr)

This elective offers students an exposure to the art of medicine - a new style of leadership where leadership becomes your natural self-expression, experience with several mindfulness practices and engagement and reflection with challenging conversations that can arise for oneself and with patients and other staff/faculty in the midst of the practice of medicine.

HLT 812 Clinical Nutrition (2 – 5 cr)

Sponsor(s): Dept. of Med Ed. & Affiliated Institutions

Locations: Fair Oaks, CA

To cover nutrition thru the life cycle of your future patients: anemia, cancer, hypertension, cardiovascular disease, diabetes, infancy, pediatrics, pregnancy and lactation, aging and chronic disease, obesity, sports, stress and nutrition support, and supplements.

MED 810 OSCE Program Assistance (.5 – 4 cr)

Review and improve history taking, physical exam and presentation skills by teaching and mentoring M1 & M2 students during their Medical Skills courses. Practice and demonstrate history taking, physical examination, and clinical presentation skills by teaching and mentoring M1 and M2 students during their Medical Skills course. Develop course related organizational skills to enhance the learning environment for M1 & M2 students during their Medical Skills course. Improve teaching skills for M1 & M2 students during their Medical Skills course. Apply self-directed learning methodologies to clinical skills. (Prerequisite: M1, M2, or M4 standing)

COLLEGE OF PHARMACY

COURSE DESCRIPTIONS- Revised

ELC 750/850: Independent Study (1-2 cr)

The purpose of independent study is to provide interested students with an opportunity to collaborate with faculty on research or specialty projects. The interested student meets with the appropriate faculty member, and the student and the faculty determine the nature and scope of the project to be completed. In collaboration the student and the faculty member design the course, the scope of the project, project specific assignments, methods of evaluation, timeline, and expectations. Prior to starting the project/course, the student and the faculty member complete the independent study form and submit the completed form to the appropriate Department Chair for approval. Once approved by the appropriate Department Chair, the completed form is subsequently submitted to the Office of Academic Affairs for final approval. Once final approval has been granted, the form will be sent to the Office of the Registrar to officially enroll the student in the course. Request form and instructions available online: <http://pharmacy.cnsu.edu/independent-study>. (Prerequisites: P2/P3 standing and minimum 2.80 cumulative GPA; Faculty, Department Chair, and Office of Academic Affairs approval.

ELC 756: Disc & Devel of Drugs for IBD & Rheumatoid Arthritis (2 cr)

The course will focus on drug development and discovery approaches for Inflammatory Bowel Disease (IBD) and Rheumatoid Arthritis (RA). The first block of classes will focus on pre-clinical models used to discover drugs for IBD. A special emphasis will be placed on animal models of IBD. Clinical protocols for both Ulcerative Colitis and Crohn's Disease patients will also be reviewed. The second block of classes will focus on drug discovery for Rheumatoid Arthritis (RA). The anti-inflammatory and analgesic effects of various drugs will be discussed, including DMARD's. Clinical trial methodology for RA will also be discussed. The course will utilize both relevant literature references, as well as real-life experiences of the instructor. Students will be expected to actively participate by way of group presentations, as well as each class participant composing a final drug discovery/development project. Pre-Reqs PBS601, PBS603, PBS602, PBS604, & CAS703.

ELC 761: Pharmacogenomics & Genetics (2 cr)

The Pharmacogenomics (PGx) and Genetics course is designed to provide pharmacy students with a fundamental understanding of current concepts and application of genetics and genomics in light of the relevance and the scope of pharmacy practice. The course is designed with a learner-centered perspective, leading step-wise through introductory content emphasizing PGx research design including utilization of key knowledge from the human genome and genome projects and Big "Omics" data such as genomic, transcriptomics, and proteomic approaches to patient care. Students are provided an application of pharmacogenomics in drug discovery, disease diagnosis, and the value of phenotyping/genotyping in guiding drug therapy of individual patients. Examples of clinical applications will be included and will examine the relationship between PGx and personalized medicine. This course uses a combination of lectures, discussions of assigned literature, projects, and student-led presentations. Pre-req PBS604, PBS701, PBS704, & CAS705. Equivalence: ELC861.

ELC 762: Pharmacists in Public Health (2 cr)

Offered as a Hybrid-Online Course

This is a hybrid course, combining online learning modules and in-class learning experiences. This elective course introduces, develops, and integrates the skills and knowledge needed for student pharmacists who choose to explore the realm of public health through applying their unique pharmacy backgrounds and interests. Throughout the course, the learning modules are designed to illustrate how pharmacy would fit into the greater scheme of health care from a public health perspective, to demonstrate how pharmacists can contribute in inter-professional efforts on enhancing the quality of healthcare services delivered, to integrate clinical practice and population health in pharmacists' work, and to identify public health efforts of which pharmacists are already a part. A large portion of this course is devoted to program planning, implementation, execution, and evaluation, preparing student pharmacists in their future leadership roles on the healthcare team. To enhance students' skills, evidence-based practice will be discussed and applied. Lastly, journal article analyses will be conducted to familiarize students with translating research results into real-world practice to promote population health management and practice.

ELC 764: Principles of Clinical Pharmacology (2 cr)

(Part 1) Offered as an Online Course

The Principles of Clinical Pharmacology Part 1 elective course will provide students with an overview of clinical pharmacology and its real-world usage. Topics relating to the following subject areas will be covered; pharmacokinetics, drugs metabolism and transport, drug therapy in special populations. This is an online course that will run for 10 weeks. Each week, students will be expected to review assigned you tube videos

that are presented by world renowned experts in each subject area and are freely available through the NIH Clinical Center. Students will also be expected to participate in weekly online discussion boards as well as complete weekly online open book quizzes. There will be an online open book final exam at the end of the course that must be completed/submitted prior to the end of the semester.

ELC 766: Special Pops. Pharmacotherapy: Preg, Peds, & Ger. (2 cr)

Special Populations Pharmacotherapy: A Focus on Pregnant, Pediatric, & Geriatric Patients will focus on common disease states affecting the pediatric, geriatric, and pregnant populations and their management. These specific patient populations require special consideration as a result of their varying pharmacokinetic and pharmacodynamics profiles. Pathophysiological and pharmacological principles of each disease state and their respective treatments will be reviewed. The course will be based on team-led topic presentations and in-class discussion to enhance students' knowledge base and improve oral and written communication skills. Each team will be responsible for presenting assigned topics (pregnant, pediatric, or geriatric topic) and creating an in-class application exercise for each topic. Additionally, each student who is not presenting will be responsible for developing questions to ask each presenting team. Class participation points will be based on student engagement with in-class applications and presentation questions. Pre-reqs: PBS602, PBS603, PBS701, & CAS705.(Equivalent to PHAR781AI "Special Populations: A Focus on Pediatric and Geriatric Pharmacotherapy")

MASTER OF PHARMACEUTICAL SCIENCES

Mission and Vision

Mission: To advance the science of pharmaceutical research by developing future scientists trained to promote health through knowledge, research, and social responsibility

Vision: Preeminence in pharmaceutical sciences research, drug development skills, and integrated education abilities

Accreditation

Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC).

California Northstate University is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC), 985 Atlantic Avenue, #100, Alameda, CA 94501, 510.748.9001

Program Overview

The two-year Master of Pharmaceutical Sciences (MPS) program offered by CNU is designed to provide fundamental knowledge and skills in the pharmaceutical sciences field to enable students to pursue careers in academia, the pharmaceutical industry, regulatory affairs, and government positions upon graduation.

This program also provides advanced training in theory and laboratory-based settings to students opting for higher education in the health-related professions (MD/PharmD, MD/Ph.D., and PharmD/Ph.D.) and graduate schools (Ph.D.). In addition, this program provides a sufficient foundation in basic pharmacology, molecular biology and biochemistry to allow the students the flexibility to pursue careers in pharmaceutical and biotechnology industries, as well as regulatory affairs.

Program Objectives

- Expand the students' foundation of Basic Pharmaceutical Sciences with emphasis in drug design, drug development or drug delivery.
- Expand the students' pharmaceutical research skills.
- Develop the students' ability to identify problems, formulate hypotheses, plan and execute experiments, analyze data and present results.

MPS at CNU: Strengths & Unique Features

- Two track options: 1) a thesis-based track, and 2) a capstone track
- Foundational core courses are complemented by a broad spectrum of well-designed electives.
- Multiple teaching pedagogical formats maximize learning and subject retention.
- Small class sizes suitable for individualized education and research skills.
- Close proximity and ties to the Colleges of Pharmacy and Medicine, with course paths to prepare students seeking entry into pharmacy or medical school.
- Established collaborations with regional clinical centers, and pharmaceutical industries, providing an array of cooperative educational opportunities.
- Located in Elk Grove, California, the second largest city in the Greater Sacramento Metropolitan Area. Northern California is the hub for many biopharmaceutical companies.

Curriculum

MPS students have two course of study track options: 1) a thesis-based track; and 2) a capstone track.

Thesis-based Track

Core Courses (25 credits)

- MPS 501 Introduction to Pharmaceutical Sciences I (3 cr)
- MPS 511 Introduction to Pharmaceutical Sciences II (3 cr)
- MPS 502 Techniques in Pharmaceutical Sciences: Theory and Practice I (2 cr)
- MPS 512 Techniques in Pharmaceutical Sciences: Theory and Practice Section II (2 cr)
- MPS 513 Biostatistics & Research Methods (3 cr)
- MPS 504 Literature & Technical Writing Skill (2 cr)
- MPS 505 Journal Club and Graduate Seminar (1 cr)
- MPS 506 Research and Thesis-I (3 cr)
- MPS 516 Research and Thesis-II (3 cr)
- MPS 526 Research and Thesis-III (3 cr)

Elective Courses (6 credits)

A minimum of 6 credits are required.

Capstone/Course Track

Core Courses (21 credits)

- MPS 501 Introduction to Pharmaceutical Sciences I (3 cr)

- MPS 511 Introduction to Pharmaceutical Sciences II (3 cr)
- MPS 513 Biostatistics & Research Methods (3 cr)
- MPS 504 Literature & Technical Writing Skill (2 cr)
- MPS 505 Journal Club and Graduate Seminar (1 cr)
- MPS 607 Drug Development & Design (3 cr)

Elective Courses

A minimum of 10 credits are required.

Elective Course Options

- MPS 601 Advanced Topics in Immunology (2 cr)
- MPS 602 Advanced Topics in Medicinal Chemistry (3 cr)
- MPS 603 Advanced Topics in Neuropharmacology (2 cr)
- MPS 604 Advanced Topics in Cardiovascular Pharmacology (3 cr)
- MPS 605 Advanced Topics in Physical Pharmacy (2 cr)
- MPS 606 Cellular and Molecular Biology (2 cr)
- MPS 607 Drug Discovery & Development (3 cr)
- MPS 608 Mechanisms of Drug Toxicity (2 cr)
- MPS 609 Novel Dosage Forms & Delivery (3 cr)
- MPS 610 Pharmacoeconomics (3 cr)
- MPS 611 Pharmacogenetics & Personalized Medicine (3 cr)
- MPS 612 Regulatory Affairs in Pharmaceuticals (3 cr)
- MPS 613 Clinical Toxicology (3 cr)

Program Learning Outcomes (PLOs)

PLO 1: Foundational Knowledge in Pharmaceutical Sciences. Demonstrates the knowledge, skills, attitudes, and ethics that are required as scientists or scientific advocates

1.1. Demonstrate essential knowledge of pharmaceutical sciences needed to advance these sciences

1.2. Evaluate scientific literature and scientific products

PLO 2: Exposure to research instrumentation and laboratory techniques of pharmaceutical sciences

2.1. Demonstrate technical proficiency with basic laboratory techniques for pharmaceutical sciences

2.2. Utilize innovation in research instrumentation and laboratory techniques in basic science and drug discovery/ development

PLO 3: Critical thinking skills and problem-solving abilities

3.1. Demonstrate skillful research design and adaptation

3.2. Apply critical thinking and problem-solving skills to make decisions in developing, testing, and producing pharmaceutical products

PLO 4: Critical writing skills and data presentation abilities

4.1. Demonstrate writing skills needed for a career in pharmaceutical sciences and effective communication of scientific ideas in oral and visual formats appropriate for key audiences

4.2. Work effectively in a collaborative scientific setting and demonstrate appropriate intercommunication skills

PLO 5: Promote scientific and technique development of pharmaceutical sciences

5.1. Demonstrate ability to design mechanism-based drugs

5.2. Utilize scientific and technical skills needed to advance the discovery and management of new drugs and other therapeutic products

Admissions

Educational Prerequisites

- A bachelor's degree (B.S. or B.A.) or higher in Biology, Chemistry or relevant science disciplines, or one year of biology and 1 year of chemistry.
- A cumulative grade point average (GPA) of 2.8 is considered competitive. When evaluating applicants, greater emphasis will be placed on courses that are relevant to our program.
- Completion of the GRE. No minimum requirement for GRE scores- only the General Test is required.

Applying to M.S. in Pharmaceutical Sciences:

- The online application must be completed fully.
- Application Fee: \$60 for applicants. Applicants who demonstrate financial need can request an application fee waiver.
- Personal Statement: Please provide a personal statement describing your professional goals as well as the characteristics you possess that make you a qualified candidate for entry into the Masters of Pharmaceutical Science Program.
- Official Transcripts: Your academic records from each college-level institution you have attended are required. Canadian applicants and all other foreign applicants must submit a foreign coursework evaluation; CNU accepts evaluations from ECE, IERF, WES, and Education Perspectives.
 - Transcripts from undergraduate and graduate institutions attended must be sent directly from the institution, even if a degree was not awarded.
- Minimum requirement GPA 2.8
- Official GRE General Test scores preferred
- Official TOEFL scores for international applicants
- Letters of Recommendation: At least two letters must be submitted from faculty members who are knowledgeable about your academic capabilities and interests.
- Official letters of recommendation should be mailed directly to CNU Master of Science in Pharmaceutical Sciences at the following address:
California Northstate University
Master of Pharmaceutical Sciences
Admissions
9700 W. Taron Dr.
Elk Grove, CA 95757

Additional Admission Requirements

Applicants are strongly encouraged to communicate with potential CNU research advisors listed in the graduate program prior to the admissions process. It is important to identify a research mentor and anticipated area of research prior to beginning the

program. Formal research laboratory rotations with faculty members will be implemented after your admission. Onsite interviews are also provided to enable applicants to familiarize themselves with CNU faculty and their research areas.

Deadlines

The deadline to submit an application for Fall enrollment will be May 1st of the same year. All supporting documents must be received prior to May 1st for a Fall enrollment and official transcripts must be received by September 30th of the same year. The online application must be fully completed to be accepted.

Student Enrollment Agreement

The Student Enrollment Agreement must be completed and submitted to the college in order to show intent to enroll in the program. The Student Enrollment Agreement is a legally binding contract when it is signed by the incoming student and accepted by the institution.

By signing the Enrollment Agreement, the student is acknowledging that the catalog, disclosures, and information located on the website have been made available to the student to read and review.

Any questions or concerns regarding the Student Enrollment Agreement should be directed to the college or university department.

Catalog, Performance Fact Sheet, and Website

Before signing the Student Enrollment Agreement, the prospective student is strongly urged to visit the University and College website at www.cnsu.edu, and to read and review the CNU General Catalog and School Performance Fact Sheet (SPFS). The SPFS contains important performance data for the institution. The Catalog contains important information and policies regarding this institution.

Student's Right to Cancel and Refund

You have the right to cancel the Student Enrollment Agreement until 12:01 AM on the first calendar day after the first classroom instruction session attended, or until 12:01 AM on the eighth calendar day after a student has signed the Enrollment Agreement, whichever is later.

Cancellation shall occur when you give written notice of cancellation to the University at the University's address shown at the top of the first page of the Enrollment Agreement. You can do this by hand

delivery, email, facsimile, or mail. Written notice of cancellation sent by hand delivery, email, or facsimile is effective upon receipt by the University. Written notice of cancellation sent by mail is effective when deposited in the mail properly addressed with postage prepaid.

After the cancellation period described above, you have the right to withdraw from the University at any time. Withdrawal shall occur when you give written notice of withdrawal to the Registrar at the University's address shown at the top of the first page of the Enrollment Agreement.

Student's Right to Withdraw and Refund

After the cancellation period described above in "Student's Right to Cancel and Refund," you have the right to withdraw from the University at any time. Withdrawal shall occur when you give written notice of withdrawal to the Registrar at the University's address shown at the top of the first page of the Enrollment Agreement. You can do this by hand delivery, email, facsimile, or mail. Written notice of withdrawal sent by hand delivery, email, or facsimile is effective upon receipt by the Registrar. Written notice of withdrawal sent by mail is effective when deposited in the mail properly addressed with postage prepaid.

The written notice of withdrawal should be on the Official College Withdrawal Form provided by the Office of the Registrar, but may also be in any writing that shows you wish to withdraw from the University. Please include your student ID number on your notice. A withdrawal may also be effectuated by the student's conduct showing intent to withdraw, including but not necessarily limited to the student's continuing and unexcused failure to attend all classes.

If you withdraw before or at completion of 60% (and no more) of the current term, you will be eligible for a pro-rata refund for such term. The University will perform a pro-rata calculation of current term tuition as follows:

Step A) Total calendar days* in current term** – Calendar days in current term completed = Total Calendar days Not Completed

Step B) Total calendar days not completed/Total calendar days in current term = % of pro-rata refund

Step C) Institutional charges*** x % of pro-rata refund = Total refund owed

* Total calendar days include weekends and holidays, except:

- Scheduled break of five or more consecutive days when no classes are offered.
- Days of leave of absence are not included in total days.

**Current term generally means the current semester, but when tuition is charged for the entire period of enrollment rather than by semester, then the current term shall mean that period of enrollment.

***Institutional charges excluded from the pro-rata refund are: (1) non-refundable registration fee (applicable to first year, first semester students only), (2) all other non-refundable fees as described in the current General Catalog, (3) Student Tuition Recovery Fund fee, and (4) Student Health Insurance premium estimated at \$3,200.00, if applicable; institutional charges included in the pro-rata refund include: (1) current term tuition.

There is no refund for students who withdraw after completing more than 60% of the current term.

If the amount of the current term payments is more than the amount that is owed for the time attended, then a refund of the difference will be made within 45 days after the notice of withdrawal is received by the Office of the Registrar. Refunds owed to the student as a result of a pro-rata calculation will be done in the following order:

- Private Educational Loan(s);
- To the student.

If the amount of the current term payments is less than the amount that is owed for the time attended, it is the sole responsibility of the student to contact the University to make appropriate payment arrangements.

Student Tuition Recovery Fund (STRF) Disclosures

Information on the Student Tuition Recovery Fund disclosures (STRF) can be found on page 150 of the General Catalog.

Tuition, Fees and Related Disclosures

All tuition, fees, expenses, and policies listed in this publication are effective as of August 2017 and are subject to change without notice by California Northstate University.

In the tables below, MPS1 and MPS2 indicate the student's year in the program, e.g. MPS1 is a first-year student; MPS2 is a second-year student.

Tuition is charged on a full-time, semester basis. Generally, tuition and fees are charged to a student's account thirty (30) days prior to the start of each semester term. The above is based on the assumption that a student will attend each semester term on a full-time basis, which allows for a student to graduate after successfully completing two (2) years of coursework consisting of 31 semester credit hours.

International students are not charged additional fees or charges associated with vouching for student status.

Payment deadlines, loan obligations, refund calculations due to cancellation and withdraw, and the Student Tuition Recovery Fund (STRF) disclosures are located on page 150 of the General Catalog.

2018-2019 MPS Tuition & Fees

Tuition & Fees (T&F)	Amount	Class
Enrollment Fee (nonrefundable)	\$100.00	MPS1
Tuition	\$30,000.00	MPS1, MPS2
Student Association Fee	\$100.00	MPS1, MPS2
Technology Fee	\$50.00	MPS1, MPS2
Pharma Sci Lab Fee	\$700.00	MPS1, MPS2
Orientation Fee	\$50.00	MPS1
Graduation Fees ¹	\$250.00	MPS2
STRF Fee per \$1000 ²	\$0.00	MPS1, MPS2
MPS1 Total Estimated Tuition & Fees per Year³	\$31,000.00	
MPS2 Total Estimated Tuition & Fees per Year³	\$31,100.00	

Total estimated cost for the 2-year Master of Pharmaceutical Sciences program ranges from \$63,000.00 to \$64,000.00³.

Other Educational Related Costs ⁴	Amount	Class
Health Insurance Premium ⁵	\$3,200.00	MPS1, MPS2
Books and Supplies ⁶	\$1,600.00	MPS1, MPS2
Room and Board ⁶	\$15,514.00	MPS1, MPS2
Transportation ⁶	\$3,098.00	MPS1, MPS2
MPS1 Total Estimated Cost per Year⁷	\$54,412.00	
MPS2 Total Estimated Cost per Year⁷	\$54,512.00	

¹Covers regalia, transcripts, etc.

²The STRF fee is \$0.00 per \$1,000 of institutional charges

³Based on estimated annual tuition increases of 3% to 5%. This estimate is not binding on the University.

⁴Costs a student may incur as part of participation in the applicable year of the Master program, whether or not paid directly to CNU.

⁵Optional, estimated, and will increase based on number of insured members.

⁶Estimated amount

⁷Includes tuition, fees, and other estimated educationally related costs

General Policies

Orientation & Registration

Registration for classes requires:

1. All admission contingencies be fulfilled.
2. Financial aid clearance from the Financial Aid Officer.
3. Completion of all new student paperwork.

Admission contingencies include proof of medical insurance coverage and any other institutional requirements. Students may enroll in the Student Health Insurance Plan to satisfy the insurance requirement.

New students must submit the *Emergency Contact and Medical Information Form* to the Office of the Registrar by the end of Orientation. To make updates, a new form must be submitted to the Registrar. The Office of the Registrar requires submission of the Authorization to Release Student Records if a student desires to grant a personal third-party (such as a parent, spouse, etc.) access to his/her student record. Please refer to the *Directory Information and Access to Student Records* section of this catalog for more information.

New students should review their local, home, and billing contact information via the Student Portal and update as needed. It is the student's responsibility to maintain valid contact information throughout their enrollment at CNU. Instructions for accessing the Student Portal is sent by the CNU IT department to the student's CNU email address.

Registration is conducted by the Registrar prior to the start of each semester for new and continuing students. Students with business, financial, or other registration holds on their account will not be registered until the Registrar is notified that the hold has been cleared. Students who are in compliance with institutional requirements or who have a hold on their student account at the time of registration are required to satisfy the requirement and may also be required to submit the Course Add/Drop form by the end of the Add/Drop period to register or make schedule changes.

Address Where Instruction Will Be Provided

Class sessions are conducted at 9700 West Taron Drive, Elk Grove CA 95757.

Catalog, School Performance Fact Sheet, and Website

Before signing the Student Enrollment Agreement, students are strongly encouraged to visit the College website at <http://pharmasciences.cnsu.edu/> and to read and review the CNU General Catalog and School Performance Fact Sheet (SPFS). The SPFS contains important performance data for the institution. The Catalog contains important information and policies regarding this institution.

By signing the Enrollment Agreement, the student is acknowledging that the catalog, disclosures, and information

located on the website have been made available to the student to read and review.

Instruction/Course Delivery

All courses for MPS are 100% face-to-face on-campus teaching, with the exception of one course: MPS 607: Drug Discovery and Development. This comprehensive course is designed using a hybrid teaching format, combining direct faculty-student interaction and eLearning.

All courses are taught in English and English language services are not provided.

Description of Facilities

Information on research laboratories and facilities utilized by California Northstate University in conjunction with the delivery of instruction for all CNU Colleges, can be located on page 161 of the General Catalog.

Academic Policies and Procedures

Academic Calendar

The academic calendar consists of two semesters lasting approximately 15 weeks long and one summer term lasting approximately 10 weeks.

Credit Hour Policy

For each 15-week semester, one (1) unit of credit is assigned per hour each week of classroom and a minimum of two (2) hours of out-of-class student work (homework) (*LEC/SEM*). For courses that include workshop and/or laboratory time, one (1) unit of credit is assigned per two (2) hours each week of student time spent in this activity (*LAB/AL*)

Code	Course Type	Code	Course Type
AL	Active Learning course	LEC	Lecture course
LAB	Laboratory Course	SEM	Seminar

Grading

A letter grade equal to or greater than C is considered satisfactory performance (passing) for completion of a course. Students must maintain a minimum cumulative grade point average (GPA) of 3.0. The breakdown for assignment of letter grades and grade points for each letter grade are as follows:

Grade	Definition	GPA Unit
A	90.0 – 100%	4.00
B	80.0 – 89.9%	3.00
C	70.0 – 79.9%	2.00
D	60.0 – 69.9%	1.00
F	<60%	0.00
I	Incomplete	Not in GPA
S	Satisfactory (70% or above)	Not in GPA
U	Unsatisfactory (<70%)	Not in GPA
W	Withdrawal	Not in GPA

GPA Calculation

To calculate cumulative GPA, letter grades will be converted to their numeric grade point value using the grading convention table above, and then added together. The sum is then divided by the number of courses taken. Grades received in retaken classes will be used in determining cumulative GPA. The grade initially received in the course will not be included in the calculation, but is recorded on the transcript.

Course Add/Drop Procedure

Changes in course registration may be made without penalty up to the end of the first week (5 class days) for fall and spring terms. Specific add/drop deadlines will apply for courses offered during the summer term.

Incomplete or Withdrawal from a Course

During a semester, a student may withdraw or fail to complete all required assignments and/or examinations due to extenuating circumstances, such as, but not limited to, an illness or a family emergency. In such cases, the course coordinator may give a grade of Incomplete for the course.

All missed assignments and exams must normally be completed within 10 business days after the end of the semester in which the Incomplete was received, or within a timeframe determined by the course coordinator. Failure to successfully complete the course will result in an earned F grade for the course and placement on Academic Probation.

Withdrawal from a course must first be approved by the course coordinator and the Office of Academic Affairs. Where a student has had to withdraw from a course a grade of W will be applied and the student will have to repeat the course next time it is offered.

Grade Appeals Procedure

A student can file an appeal if there is a disagreement with a final course grade. The appeal must be submitted within ten (10) business days of online grade posting. The student must initiate a formal grade appeal process in writing and present the appeal to the course coordinator.

The faculty member will respond to the student in writing within ten (10) business days. If the appeal cannot be resolved, the student has two (2) business days to appeal in writing to the appropriate Department Chair who renders a decision in writing within ten (10) business days of receipt of the formal appeal. (If the course Coordinator is the Department Chair, then the student may appeal the decision directly to the Vice President of Academic Affairs. The student has two (2) business days to submit an appeal in writing to the Vice President of Academic Affairs. The Vice President of Academic Affairs will render a decision in writing within ten (10) business days of receipt of the formal appeal).

If the Department Chair cannot resolve the appeal, the student has two (2) business days to submit an appeal in writing to the Vice President of Academic Affairs. The Committee will render a decision in writing within ten (10) business days of receipt of the formal appeal.

If a grade appeal is approved, the professor must complete a Grade Change Form and submit the form to the Vice President of Academic Affairs for final approval. The form must then be submitted to the Registrar so that the grade can be changed on the transcript.

A record of the final decision concerning the appeal will be kept on file in the Vice President of Academic Affairs office.

Academic Progression Policy

The Master of Pharmaceutical Sciences (MPS) at California Northstate University has a rigorous academic progression policy to ensure students' progression through the curriculum in a timely manner.

The purpose of the academic progression policy is to ensure students in the MPS program reach and maintain high standard of course learning and successfully complete course credits and thesis or capstone paper within required time frame.

Students in the MPS program must pass all courses each semester with a least a grade of C and maintain a minimum grade point average (GPA) of 3.0. A grade of D or below in a course indicates a lack of understanding of the fundamental knowledge of the course necessary for progression.

Students struggling with academic courses must complete the MPS program within 3 years (2-year program) or 5 years (dual degree-MPS/PharmD) from the time they register and attend their first core course if insufficient knowledge has been identified and remediated.

Remediation

Remediation is provided to students who earn a letter grade lower than C in any course in the MPS curriculum. The course coordinator/instructors determine the format of remediation examination that covers the course material presented throughout the course. Preparation of the remediation exam is the sole responsibility of the student. A grade of C to this course will be reported to the Registrar if the remediation examination was satisfactorily completed.

Academic Probation

If a student fails a course or remediation is taking place for three or more courses, the student will be automatically placed on academic probation for three-year plan (2-year program) or five-year plan (dual degree-MPS/PharmD) from the time they register and attend their first core course. An academic plan for probation must be documented and approved by the Dean of the College of Graduate Studies.

Dismissal

A student may be dismissed from the MPS program if any of the following conditions occur and the Professional and Academic Standards Committee determines that dismissal is warranted:

- Failure to meet any terms of remediation or academic probation.
- Conduct subject to dismissal as described in the Student Handbook.
- Failure to complete the degree requirements in three (two-year program) or five (dual degree) consecutive academic years from the date of the first day the student begins the program.

Appeal of Dismissal

Students dismissed from the MPS program may appeal the decision in writing within thirty calendar days of notification of dismissal to the Dean of the College. The Dean will render a decision in writing within 15 calendar days of the receipt of the formal written appeal. The Dean's decision is final.

Degree Requirements

The Master in Pharmaceutical Sciences degree is a two year (21-24 months) program. All requirements must be fulfilled within a period of two years following initial registration, although course credit is not nullified until three years after completion of a course. Any student who has not achieved candidacy by the end of their second year will be reviewed by the Thesis Committee for placement on academic probation, regardless of grade point average, and recommendations for progress will be established.

Degree requirements for the Thesis-based track and the Capstone/Course track are as follows:

Thesis-based Track:

To graduate from the M.Sc. program, students in this track must earn a minimum of 31 credits. In addition to the course requirements, students must pass a written prequalifying examination and complete a thesis.

Capstone/Course Track:

Students in this track must pass a minimum of 31 credits along with successfully completing a written qualifying examination, and a capstone paper that consists of conducting a detailed literature review and analysis on a selected topic in lieu of a thesis.

Comparison of Thesis-based and Capstone Track

	Thesis Track	Capstone Track
Years	2	2
Total Credits	31	31
Core Course Credits	25	21
Elective Credits	6	10
Written Examination	Yes	Yes
Thesis	Yes	Capstone paper

Attendance Policy

The MS program will follow University guidelines in attendance policy, which requires mandatory attendance for all students. Specifically, students are expected to attend and participate in all classes, and complete all exams and assessments as scheduled (together defined as "coursework").

However, occasionally an absence from coursework will be unavoidable. The policy described below delineates the circumstances when an absence will be considered excused along with expectations for timely communication with the Course Coordinator and makeup of missed coursework.

A. Approval of Absence

Students should seek approval for an absence from the course coordinator well in advance of the absence if possible, by completing an Excused Absence Request Form. In the case of emergency absence, students should complete and submit the Excused Absence Request Form within 3 business days of returning to campus after the absence. Regardless of whether an absence is excused or unexcused, students are expected to demonstrate professionalism and to follow procedure when requesting an absence.

B. Duration of Absence

A student may request no more than three academic days of excused absences per semester. Absences exceeding five academic days per semester may require a student to request a Leave of Absence or a Withdrawal. Students must contact the Office of Academic Affairs (OAA) if any one absence period exceeds five days to discuss these options.

C. Type of Excused Absence

A student may request an excused absence, from the course coordinator, only for reasons listed below:

Medical (self or immediate family)
 Military duty
 Immigration & Naturalization
 Jury duty
 Legal
 Bereavement (first degree relative)
 Involvement in traffic accident documented by law enforcement report
 Professional Leave – conferences, invited presentations/posters, competitions, (requires verification of academic standing).

D. Makeup Allowances

Students are responsible for contacting the course coordinator to arrange makeup of coursework, otherwise they will receive a zero grade. A student seeking an excused absence should complete the Excused Absence Request Form and seek the Course Coordinator's signature for each course the student was absent within three business days upon return to courses or campus. The form must then be given to the Dean of Academic Affairs, who will approve or not the absence request. The OAA will notify the student and course coordinator of the outcome of the absence request.

If an absence is excused, students will be allowed the option to make up missed coursework, rotations, or missed assessments. The nature and type of makeup, makeup time, date, format, duration, and grading is at the sole discretion of the Course Coordinator, but in general Coordinators will draw the following distinction between "high" and "low" stakes assessments/coursework, and professional leave:

A student who is absent for a "high stakes" exam or other such activity considered high stakes, provided the absence has been excused, will be required and allowed to make up the work.

If a student is absent for a "low stakes" assessment the Course Coordinator may choose to drop the missed coursework from the gradebook or provide a makeup opportunity.

A student requesting an absence to attend a professional meeting must demonstrate they are in good academic standing. Requests for professional leave must be submitted at least 10 business days in advance of the professional conference attendance. If attendance coincides with a high stakes exam it is highly likely that the absence will be denied.

Leave of Absence

A leave of absence is approved for a specific period of time, not to exceed more than a year, and the institution agrees to permit the student to return to the

University/College without formally reapplying for admission to the University/College.

The student will be required to return to the University/College at the beginning of the semester in which the leave was granted. All students requesting a Leave of Absence should fill out a Leave of Absence Form after discussing their decision with the Academic Official for Academic Affairs. If a student is requesting a leave of absence, the Academic Official for Academic Affairs must sign the form. If the student is approved for a leave of absence, the student is eligible to return without reapplication if the absence is within the approved time frame. A student requesting a leave of absence should also meet with the Financial Aid Manager and Business Office to determine impact of their decision and any requirements needing fulfillment prior to the leave.

Non-attendance does not constitute notification of intent to apply for leave of absence status. The date of leave status is the date the Registrar receives the signed form.

Return from Leave of Absence

The Office of the Registrar will contact a student on Leave of Absence (LOA) approximately 90 days before the LOA expires via certified US mail and the email addresses on record. The student will receive the Intent to Return Form and instructions for re-enrollment and for withdrawing from the University.

The student will have 30 days of the date of the notice to reply to the Office of Registrar with their intent to return to the University/College or officially withdraw.

If a student does not return within 1 year of approved LOA they are no longer eligible to return as a continuing student and must reapply to the University/College for admission.

Journal Club & Attendance at Seminars and Thesis Presentations

The journal club and graduate seminar are conducted mainly by students, facilitated by the course coordinator. Each week, a student presents a paper related to their research/scholarship interest. The chosen paper will be announced prior to the class and copies provided to all participants. The goal of the journal club is to create an open venue for friendly but lively scientific discussion. Students are encouraged to critically review the paper, and understand how to gauge its impact on the field. Grades will be determined primarily based on the presentation of the student during the course, as well as overall class participation.

Assisting in Research and Teaching

Under the recommendation of faculty members and the advisory committee, research assistantship and teaching assistantship that cover tuition and other expenses are provided to outstanding graduate students with the final approval from the Dean.

MPS Thesis Advisory Committee

This committee, which is recommended by the MPS program Director and approved by the Dean, shall consist of at least three faculty members. All members of the committee shall be members of the Graduate Program Faculty. The student's Major Advisor (Thesis Mentor) typically serves as Chair of the committee.

Thesis Guidelines

The thesis is a vital portion of the curriculum for graduate students choosing the thesis-based track. These students will conduct hands-on, original research in CNU's state-of-the-art laboratories, mentored by faculty with experience in the biomedical and pharmaceutical sciences. Students will select their research topics after consultation with their major advisors. This course will examine student capabilities in scientific literature review, research design, research execution, statistics, result analysis & discussion, and written skills as required to produce a laudable thesis. Lab-based thesis research starts in the summer of the 1st year and proceeds through the entire 2nd year, with 1 credit in each semester. Students will be evaluated each semester, and their progress monitored closely by their thesis advisors. The components of this course evaluation include the following comprehensive elements: literature review; experimental design; research performance; statistical analysis; result presentation and discussion, and conclusion.

- Literature review: 5%
- Research design: 20%
- Research performance: 20%
- Statistical analysis: 5%
- Result analysis and expression: 10%
- Discussion: 10%
- Thesis quality: 20%
- Oral presentation: 10%

Final grades for the student thesis will be indicated as Satisfactory (S) or Unsatisfactory (U) without any computation of grade points for the course into the semester or cumulative grade point average (GPA). A Satisfactory score in this course is granted based on the evaluation results with 70% or above. Unsatisfactory for Research & Thesis will be indicated if the net result of evaluation components is less than 70% in two semesters. Extension to the 3rd year for students with "U" grade will be reviewed by the thesis committee and

approved by the Dean of College of Graduate Studies. Only one year extension is allowed for students with "U". For details please refer to the Graduate Student Handbook.

Thesis Defense

Defense of thesis is the final step for graduate students on the thesis-based track. This process tests the depth and breadth of knowledge in pharmaceutical sciences, and will assess the overall understanding of scientific inquiry as it relates to the thesis. Students will be expected to justify their decisions in study design and interpretation of data. The advisory committee will make the recommendation based on the quality of thesis, answers to all questions, and other factors. The Dean of College of the Graduate Studies will make the final decision upon the recommendation of committee.

Requirements for Laboratory-based Research

Laboratory research is one of the essential components for graduate students in the Master's program in Pharmaceutical Sciences at California Northstate University (CNU). Any students working in the Lab must abide by the following standards.

1. Students must complete the Collaborative Institutional Training Initiative (CITI) training and relevant biosafety training that are required for the personnel working in the Lab at CNU. CITI is an on-line service program providing research ethics and related modules to faculty, staff, and students working for research projects or courses. Students must present completion certificates to their major advisors prior to self-directed work in the labs. Students must complete and pass the Responsible Conduct of Research course and the student Biosafety and Biosecurity Course. Additional courses may be recommended or required by their instructors.
2. Students must respect all ethical standards and must observe all federal, state, local, and institutional regulations.
3. Students must abide by all safety regulations while present in the labs, including those regarding appropriate clothing and shoes. Students must wear lab coat, gloves, and other appropriate personal protective equipment when performing procedures in the Lab.
4. Students must follow all standard operating procedures and protocols when conducting research.
5. Students must work in their designated areas. All shared equipment and instruments must be cleaned and stored in their original location after completing experiments.
6. Students must maintain original research records, catalogs, and research materials following good

practices. Computer records must be consistent with the notebooks. Students are strongly encouraged to discuss the records and seek approval from the advisors.

7. All packages, containers, buffers and reagents in the Lab must have discernible, compliant labels that include name, date, identity, and sources.
8. Eating, drinking, or smoking in the Lab are strictly prohibited. Violators will be excluded from the research projects or relevant courses.
9. Hand washing with clean, running water is a good practice before leaving the Lab, and is required after certain procedures.
10. It is expected that all students will exercise professionalism and decorum while in the Labs. Horseplay, practical jokes, pranks or other inappropriate or distracting behaviors will result in a loss of Lab privileges and may impact student graduation.
11. Please report all unexpected issues to your advisors or Lab Manager.

Student Grievance Policy

If a student wishes to file a grievance, they can submit a written complaint using the Complaint/Grievance form placed in a sealed envelope and delivered to the Vice President of Academic Affairs or submit an online Anonymous Report available on the CNU website. The Vice President of Academic Affairs will handle the complaint in accordance to University policies and after a review of the facts will attempt to resolve the issue. Any resolution will be provided to the student in writing within 4 weeks of the form submission, excluding holidays and University breaks.

For complaints related to accreditation standards can be found on page 9 of the General Catalog.

Student Services

Information on Student Services can be located on page 156 of the General Catalog.

MPS 2018-2019 Academic Calendar

Fall 2018

Description	Start Date	End Date
Orientation	Wednesday, August 29 th	Thursday, August 30 th
Holiday-Labor Day	Monday, September 3 rd	
Fall Academic Semester	Tuesday, September 4 th	Thursday, December 13 th
Course Add/Drop Period	Tuesday, September 4 th	Monday, September 10 th
Holiday-Thanksgiving	Thursday, November 22 nd	Friday, November 23 rd
Final Exams	Thursday, December 6 th	Thursday, December 13 th
Winter Break	Friday, December 14 th	Tuesday, January 1 st
Final Grades Due	Thursday, January 17 th	

Spring 2019

Description	Start Date	End Date
Spring Academic Semester	Wednesday, January 2 nd	Thursday, April 25 th
Course Add/Drop Period	Wednesday, January 2 nd	Monday, January 7 th
Holiday-Martin Luther King Jr.	Monday, January 21 st	
Holiday-President's Day	Monday, February 18 th	
Holiday-Spring Break	Monday, March 18 th	Friday, March 22 nd
Final Exams	Thursday, April 18 th	Thursday, April 25 th
Summer Break	Friday, April 26 th	Friday, May 10 th
Final Grades Due	Friday, May 10 th	

MPS Course Descriptions

MPS 501 Introduction to Pharmaceutical Sciences I (3 cr)

Crosslist: PBS 605 TBL Pharmaceutics and Calculations
This course is designed to provide students with the deep understanding of the drug physicochemical properties and its effects on drug formulation and computing, dosage form as well as an understanding of the interactions between drug delivery systems and biological systems. The course covers the traditional and non-traditional dosage forms as well as drug delivery systems. The course also covers pharmaceutical calculations and an overview of drug quality control and regulation.

MPS 502 Techniques in Pharmaceutical Sciences: Theory and Practice I (2 cr)

The first of this two-section course provides theory and hands-on experience in a number of commonly used instruments and techniques in formulation and drug preparation and analysis.

MPS 504 Literature & Technical Writing Skill (2 cr)

This graduate-level course is designed to introduce students to the science of written communication in the context of biomedical and pharmaceutical sciences. It will also introduce them to the structure, approach and writing of a Master's Thesis. The course reviews the cognitive processes involved in higher-level scientific writing and reading, and then applies these concepts to promote clarity, organization and focus in biomedical research and publication. The course then covers skills necessary to develop and write their Master's Thesis, including literature search and citation methods, scientific integrity, tools to avoid plagiarism, the application of the scientific method to research design, and thesis components and chapters.

MPS 505 Journal Club and Graduate Seminar (1 cr)

The journal club and graduate seminar is conducted mainly by students, with facilitation by a faculty member. Each week one or multiple student(s) will present a paper related to his/her research/scholarship interest(s). The chosen paper will be announced prior to the class and copies provided to all participants.

MPS 506 Research and Thesis - I (3 cr)

This course is designed to provide hands-on research experience in laboratories of biomedical and pharmaceutical sciences. Students will choose the research topics after consultation with their major advisors. This course will exam the students' capabilities in original article review, research design,

research execution, statistics, result analysis & discussion, and written skills of thesis.

MPS 511 Introduction to Pharmaceutical Sciences II (3 cr)

Crosslist: PBS 602 Pathophysiology & Pharmacology I
This course introduces the basic mechanisms of pathophysiology and pharmacology, and then integrates these disciplines through the study of the etiology, pathogenesis, clinical manifestations, treatment and prevention of major neurologic, psychiatric, and neuroendocrine diseases/disorders. Following an introduction to normal tissue types and adaptive responses, the course will cover basic etiological and pathophysiological mechanisms; mechanisms of injury will be reviewed; the central and peripheral nervous systems (CNS & PNS) are reviewed, major CNS, PNS and neuroendocrine diseases and disorders are covered, Students will learn the mechanism(s) of action and common or serious adverse effects of pharmacological agents and identify appropriate pharmacological treatments or adjust pharmacotherapy in the face of adverse effects. In addition, each student team will research a topic in depth, including a systematic search of peer-reviewed literature, to develop and present a formal case study, given at a level appropriate for an audience of healthcare professionals. To promote information literacy, teams will use systematic PubMed searches using MESH terms to identify and incorporate current literature reviews, guidelines, or other advanced professional sources, and carefully cite the information and sources on their slides.

MPS 512 Techniques in Pharmaceutical Sciences: Theory and Practice Section II (2 cr)

Section two is focused on basic techniques and skills as well as common instruments in cellular and molecular biology and pharmacology. Basic lab skills, cell culture introduction, protein expression & determination, DNA extraction and PCR, and pharmacological screen and evaluation will be instructed in this course.

MPS 513 Biostatistics & Research Methods (3 cr)

Crosslist: CAS 606 Biostatistics and Pharmacoepidemiology

This course is designed to introduce major concepts in biostatistics and pharmacoepidemiology. Students will develop the ability to interpret and critically evaluate medical literature and to identify findings that have implications for their practice. Emphasis will be placed on an examination of how observational study designs draw upon epidemiologic techniques to address drug effectiveness, safety, outcome assessment and regulatory decision making. Students will also acquire skills in applying statistical analysis concepts learned throughout this course with the use of common computer software.

MPS 516 Research and Thesis - II (3 cr)

This course is designed to provide hands-on research experience in laboratories of biomedical and pharmaceutical sciences. Students will choose the research topics after consultation with their major advisors. This course will exam the students' capabilities in original article review, research design, research execution, statistics, result analysis & discussion, and written skills of thesis.

MPS 526 Research and Thesis - III (3 cr)

This course is designed to provide hands-on research experience in laboratories of biomedical and pharmaceutical sciences. Students will choose the research topics after consultation with their major advisors. This course will exam the students' capabilities in original article review, research design, research execution, statistics, result analysis & discussion, and written skills of thesis.

MPS 601 Advanced Topics in Immunology (2 cr)

Crosslist: PBS 803 Immunology & Rheumatology
The course will initially focus on an overview of innate and adaptive immunity as well as basic principles of cellular immunology. A special emphasis will then be placed on integrating the underlying pathophysiological and applicable pharmacological mechanisms, which can be used in the intervention and management of immunological-based diseases. These disease states include: Rheumatoid Arthritis, Psoriasis, Crohn's Disease, Systemic Lupus Erythematosus, and Multiple Sclerosis. Other topics covered in the course include organ transplantation, vaccination for disease, immunodeficiency and AIDS, as well as interactions between the immune system and cancer. Students are provided with an overview of immunity, cells and proteins of the immune system, along with their specific roles and interactions in human disease.

MPS 602 Advanced Topics in Medicinal Chemistry (3 cr)

Crosslist: PBS 603 TBL Medicinal Chemistry & Physical Pharmacy
The course consists of four components: (1) drug structure-relationships, prediction of the physico-chemical properties of a drug, basic knowledge of the major pathways of drug metabolism and factors that can contribute to drug-drug interactions; (2) the solubility, metabolism and pharmacological activity/potency of drugs classes based on the contribution of their functional groups to their structures; (3) drug assay and the application of chemical and physico-chemical methods of analysis to pharmaceutical substances; (4) active constituents of natural medicines with emphasis on the top selling medicinal herbs. (Prerequisite: none)

MPS 603 Advanced Topics in Neuropharmacology (2 cr)

Crosslist: ELC857 Advanced Neuropharmacology
The course introduces classical, emerging, and cutting-edge topics in neuropharmacology. It provides an opportunity for students to gain an in-depth understanding of the molecular mechanisms recognized as potential drug targets in the central nervous system (CNS), as well as exploring emerging therapies utilizing evolving knowledge in neuropharmacology. Each team will develop an in-depth, TBL-style journal club presentation to lead the class on an important topic in neuropharmacology.

MPS 604 Advanced Topics in Cardiovascular Pharmacology (3 cr)

The objective of this course is to prepare graduate students with knowledge of current advances in the area of cardiovascular pharmacology, especially at molecular levels. Novel targets in prevention and treatment of cardiovascular disease, including chronic heart failure, hypertension, dyslipidemia, myocardial infarction, and arrhythmias will be discussed in this course.

MPS 605 Advanced Topics in Physical Pharmacy (2 cr)

Students will learn the physical and chemical theories that affect drug design, drug delivery, formulation and manufacturing. The fundamental theories discussed in this course will allow students to make appropriate recommendations toward optimization of dosage forms with respect to the physiochemical properties of the active and inactive ingredients used. In addition, the students will be able to choose and optimize experimental design needed to prepare conventional and controlled dosage forms.

MPS 606 Cellular and Molecular Biology (2 cr)

Crosslist: PBS 601 Cellular and Molecular Biology and Biochemistry
This course is designed to provide the pharmacy students with a fundamental understanding of current concepts of cellular and molecular biology, and human biochemistry. Students are provided an overview of eukaryotic carbohydrate, lipid and protein metabolism, cellular signal transduction, biomedical aspects of human nutrition, genetic regulation, the molecular basis of inherited genetic diseases and acquired diseases like cancer, principles of commonly used biotechnologies, drug targets screening, and biopharmaceutical products generation. (Prerequisite: none)

MPS 607 Drug Discovery & Development (3 cr)

Crosslist: ELC 756 Disc & Devel of Drugs for IBD & Rheumatoid Arthritis
The course will focus on drug development and discovery approaches for Inflammatory Bowel Disease (IBD) and Rheumatoid Arthritis (RA). The first block of

classes will focus on pre-clinical models used to discover drugs for IBD. A special emphasis will be placed on animal models of IBD. Clinical protocols for both Ulcerative Colitis and Crohn's Disease patients will also be reviewed. The second block of classes will focus on drug discovery for Rheumatoid Arthritis (RA). The anti-inflammatory and analgesic effects of various drugs will be discussed, including DMARD's. Clinical trial methodology for RA will also be discussed. The course will utilize both relevant literature references, as well as real-life experiences of the instructor. Students will be expected to actively participate by way of group presentations, as well as each class participant composing a final drug discovery/development project.

MPS 608 Mechanisms of Drug Toxicity (2 cr)

This course will introduce the basic knowledge of toxicology. The general concepts and theories associated with the toxicity induced by drugs will be covered. The organ toxicity and related cellular and molecular mechanism of drug-induced toxicity will be delineated in this course.

MPS 609 Novel Dosage Forms & Delivery (3 cr)

The students will learn about various novel drug delivery systems with a focus on delayed release, controlled release and targeted dosage forms. The students will also learn about new excipients and methods involved in these novel dosage forms preparation.

MPS 610 Pharmacoeconomics (3 cr)

This course is designed to familiarize the student with the economic structure, conduct and performance of the pharmaceutical industry. The course includes such topics as prices and profits in the industry,

productivity, cost, economies of scale, innovation, economic effects of regulation, cost benefit and cost effectiveness of pharmaceuticals and efficiency of drug delivery systems. (Pre-requisite: one undergraduate economics course or permission of the instructor)

MPS 611 Pharmacogenetics & Personalized Medicine (3 cr)

This course provides introduction to topics in human genetics and genomics, and how these topics are related to medications and patient treatment. An emphasis will be placed on basic principles of human genetics and how they are relevant to the field of translational genetics and drug design. There will also be discussion of the ethical and societal issues concerning personalized medicine as well as future implications for patient care.

MPS 612 Regulatory Affairs in Pharmaceuticals (3 cr)

This course focuses on regulatory strategy, guidance and regulatory compliance, legal and ethical issues, processes for product development and the business components of regulation in clinical research, all while reinforcing the science behind the methods. The regulatory affairs course provides students with the knowledge and understanding for the key elements of the regulatory process in various industries, governmental agencies, and consultancies worldwide.

MPS 613 Clinical Toxicology (3 cr)

This course describes the principles of toxicology and toxic effects of therapeutic and non-therapeutic agents. The signs and symptoms as well as clinical management of drug-induced toxicity are also covered in this course.

MPS Curriculum

Year 1 – Fall		Year 1 – Spring		Year 1 – Summer	
Course	Credit	Course	Credit	Course	Credit
MPS 501-Introduction to Pharm. Sci.	3	MPS 511 –Introduction to Pharm. Sci.	3	MPS 506 – Research and Thesis-I	3
MPS 502- Techniques in Pharm. Sci.	2	MPS 512 -Techniques in Pharm. Sci.	2	MPS 505 – Journal Club & Graduate Seminar	1
MPS 504 – Literature & Tech. Writing Skill	2	MPS 513 – Biostatistics & Research Methods	3		
MPS 505 – Journal Club & Graduate Seminar	(1)	MPS 505 – Journal Club & Graduate Seminar	(1)		
Semester Credit	7		8		4
Year 2 – Fall		Year 2 – Spring			
Course	Credit	Course	Credit		
MPS 505 - Journal Club & Graduate Seminar	(1)	MPS 505 - Journal Club & Graduate Seminar	(1)		
MPS 516 - Research and Thesis-II	3	MPS 526 - Research and Thesis-III	3		
MPS 604 – Advanced Topics in Pharmacology (or other elective)	3	MPS 609 – Novel Dosage Forms & Delivery (or other elective)	3		
Semester Credit	6		6		

MPS FACULTY DIRECTORY

For a current listing of people, titles and contact information, please visit: <http://pharmasciences.cnsu.edu/faculty>

Lakshmi Chaturvedi, Associate Professor, COP & COM
PhD, Sanjay Gandhi Postgraduate Institute of Medical Sciences, UP, India

Suzanne Clark, Associate Professor, COP
PhD, Duke University

Ahmed El-Shamy, Assistant Professor
PhD, Kobe University, Japan

Hatem Elshabrawy, Assistant Professor, COP
PhD, University of Illinois at Chicago

Leo Fitzpatrick, Assistant Dean of Research, COP
PhD, George Washington University

Linh Ho, Assistant Professor
PhD, University of California San Francisco

Ishwarlal Jialal, Professor, COM
MD, PhD University of Natal Medical School, Natal, South Africa

Zhuqiu Jin, Associate Professor, COP
PhD, Central South University

Simeon Kotchoni, Associate Professor, COP
PhD, University of Bonn, Germany
MS, University of Abomey Calavi, Benin
MS, Obafemi Awolowo University, Ile-Ife, Nigeria

Eugene Kreys, Assistant Professor, COP
PharmD, PhD University of Michigan of Pharmacy, University of Texas, Austin

Uyen Le, Chair; Associate Professor
PhD, Oregon State University

Justin Lenhard, Assistant Professor, COP
PharmD, University at Buffalo School of Pharmacy and Pharmaceutical Sciences

Philip Mack, Associate Professor, COM
PhD, University of California, Davis

Ruth Vinall, Associate Professor, COP
PhD, Cardiff University, U.K.

Hongbin Wang, Assistant Professor, COP
PhD, University of Pennsylvania
MS, Second Military Medical University, Shanghai, China

Tibebe Woldemariam, Associate Professor, COP
PhD, University of Bradford, U.K.

Catherine Yang, Professor, COM
PhD, Tufts University

COLLEGE OF HEALTH SCIENCES

Revised Program Learning Outcomes (PLOs) -

Upon successful completion of the CNUCHS Bachelor of Science in Health Sciences, students will be able to demonstrate the following Program Learning Outcomes (PLOs):

- PLO1: Core Sciences and Mathematics.** Demonstrate knowledge of the core sciences and mathematics.
- PLO2: Arts and Humanities.** Demonstrate understanding of how the arts and humanities enhance health, well-being, and healthcare practice and delivery.
- PLO3: Critical and Systemic Thinking.** Demonstrate understanding of the collaborative nature of healthcare delivery.
- PLO4: Professional Interaction.** Communicate with respect, empathy, and cultural competence.
- PLO5: Social Accountability and Community Service.** Acts with social accountability and demonstrates commitment to community service.

The Program Learning Outcomes are fulfilled by completion of the following courses:

PLO1: Core Sciences and Mathematics (3 cr)

BIOL310, BIOL310L, BIOL320, BIOL330, BIOL340, BIOL350, BIOL420, BIOL420, BIOL440, COLL310 & COLL320

PLO2: Arts and Humanities (3 cr)

HIST310, HUMN410, PHIL310, & PHLT310

PLO3: Critical and Systemic Thinking (3 cr)

PHIL310, PSYC310, PSYC320, PSYC410, PSYC420, PSYC430 & SOCL410

PLO4: Professional Interaction (3 cr)

COLL420 & COLL220

PLO5: Social Accountability & Community Service (2 cr)

COLL220

PLO Requirement

Courses satisfying a PLO must be completed at CHS. While a transferred equivalent course cannot satisfy a PLO, it can count toward general elective degree credit. In some instances, a course may satisfy more than one PLO. In such instances, the credit from the course will only count once toward the degree.

CHS Course Descriptions – Revised

BIOL 430 Pharmacology (3 cr)

This course surveys major classes of drugs in clinical use and also introduces the science of modern drug discovery. A drug is broadly defined as any chemical that affects physiological function. Drugs that have been clinically tested and approved for human use are also powerful chemical tools used to manage symptoms and treat disease. The science of pharmacology is concerned with mechanisms of drug action at various levels from the whole organism to the cellular level to molecular interactions. (Prerequisites: PMPB; or BIOL220 and (CHEM310 or BIOL240).

BIOL 460 Human Functional Anatomy (3 cr)

This course provides a comprehensive and integrative examination of the structure, function and evolution of the human body through integration of several fields of study. Structures and their organization are interpreted in terms of embryological, developmental, biomechanical and phylogenetic properties. Although the course requires rigorous, focused effort, its pay-off comes from a solid understanding of the whole organism's biology. The course reduces the number of unexplained facts otherwise encountered in descriptive anatomy, in favor of an in-depth study of human form and function. (Prerequisites: successful completion of C grade or better of an introductory course in whole organism biology, BIOL110 or PMPB).

BIOL 470 Integrated Biological Problem Solving (3 cr)

Students will work each week to enhance critical thinking skills required by working through integrated biological problems. Students will be expected to integrate their knowledge of the basic sciences including cell biology, biochemistry, immunology, genetics, and pharmacology in order to solve clinically based biological science problems. (Prerequisites: CHEM210 & BIOL220. Recommended BIOL240)

CHEM 210 Organic Chemistry I (3 cr)

This course covers the chemistry of major classes of organic molecules and functional groups such as halogens, amines, ethers, esters, and amides. Organic compounds are broadly defined as molecules that contain carbon, an extremely versatile element in terms of its chemistry. (Prerequisites: CHEM120)

CHEM 210L Organic Chemistry I Laboratory (1 cr)

Students will explore principles and techniques of organic chemistry while developing proper safety and laboratory skills. Focus is placed on separation, purification, and characterization techniques including extraction, distillation, chromatography, optical activity, recrystallization, and spectroscopy. (Co-requisite: CHEM210).

CHEM 220 Organic Chemistry II (3 cr)

A continuation of CHEM210 that expands upon organic reactions, organic synthesis, and biomolecules relevant to biology and medicine. (Prerequisites: CHEM210)

CHEM 220L Organic Chemistry II Laboratory (1 cr)

Companion laboratory course to be taken concurrently with CHEM220 lecture course. (Prerequisites: CHEM 220 if not taken together)

COLL 430 Service Learning for Health Care Professionals (3 cr)

(Formerly COLL530 and titled Community Outreach Project) This course provides frameworks, theories, experiential learning, and models for students to understand their service learning experience and support them during their placement with a community partner. Student work addresses the needs of the community, as identified through collaboration with community partners, while meeting learning outcomes through critical reflection meant to prepare students for social accountability and cultural competence development. A background check (fee varies) may be required by community partners. (Prerequisites: COLL210 and COLL220 or PMPB).

SOCL 410 Sociology for Health Practitioners (3 cr)

Sociology for Healthcare Professionals undertakes a detailed examination of the biopsychosocial contributions to the health sciences. Through lectures, readings, and class discussions, students will engage and reflect on health and illness as it is portrayed in the U.S. This course critically examines how health and illness are defined and socially constructed, experiences of illness, training and hierarchies of health care workers, medicalization and social control, and the ethical issues surrounding such topics. Application of theories and concepts to real life situations and practical applications are emphasized. (Prerequisites: SOCL110 or instructor approval)