

# SURGERY (SURG)

## **SURG 100A. Virtual and Real: Human Anatomy and Sports Injuries of the Limbs and Torso. 3 Units.**

This undergraduate course is designed to teach human anatomy through radiographs, CT scans, MRIs and cadaver material with the emphasis on the understanding of common sports injuries of the torso and limbs. To aid students in developing their image interpretive skills, additional resources such as virtual interactive scans, the 3D anatomy table, and interactive digital applications will be utilized. This course divides the anatomy of the body into five areas; each area will be presented in a two-week block. In the first week of each block, students will develop an understanding of human anatomy through the identification of relevant structures on prosecutions (cadaver material), and in the second week, students will utilize this knowledge in the interpretation of radiographs, CT scans and MRIs. The anatomy will be taught in relation to common sports injuries; and, student projects will focus on the understanding of the anatomy and treatment of these conditions and injuries. The class is limited to 20 students.

## **SURG 100B. Virtual And Real: Human Anatomy And Sports Injuries Of The Head And Neck. 3 Units.**

This undergraduate course is designed to teach human anatomy through radiographs, CT scans, MRIs and cadaver material, with the emphasis on the understanding of common sports injuries of the head and neck. To aid students in developing their image interpretive skills, additional resources such as virtual interactive scans, the 3D anatomy table, and interactive digital applications will be utilized. The course divides the anatomy of the head and neck into five areas: each area will be presented in a two-week block. In the first week of each block, students will develop an understanding of human anatomy through the identification of relevant structures on prosecutions (cadaver material), and in the second week, students will utilize this knowledge in the interpretation of radiographs, CT scans and MRIs. The anatomy will be taught in relation to common sports injuries of the head and neck; and, student projects will focus on the understanding of the anatomy and treatment of these conditions and injuries. The class is limited to 20 students.

## **SURG 100C. Virtual and Real: Human Anatomy and Sports Injuries: Grand Rounds. 3 Units.**

This undergraduate course is designed to give students who have completed SURG 100a and /or SURG 100b, the opportunity to expand their knowledge of specific sports injuries through research and through the creation and deliverance of a grand rounds (45-60 minute) presentation. Students, with guidance by faculty, will work in groups and will each choose a specific sports injury to study. Students will be encouraged to use resources such as cadaver specimens, radiographs, CT scans, MRIs, the 3D anatomy table and interactive digital applications, along with consulting experts in the field of sports medicine. Each grand round presentation will focus on a clinical case, and cover the patient's symptoms, medical history, clinical examination, lab tests, prescribed images, differential diagnosis, definitive diagnosis, treatment and treatment outcomes. The course will be given over an eightweek period. In the first week, students will be divided into groups, research potential sports injuries and decide on a specific sports injury to study. The second class will focus on each group developing a presentation outline and receive approval by faculty. In sessions three through six, students, under faculty supervision, will research and prepare their presentation, which will be presented to the entire class during weeks seven and eight. Sufficient time will be allotted for thorough discussion after each presentation. The class is limited to 16 students.

## **SURG 101. Regional Study of Human Structure. 5 Units.**

Enrollment limited to seniors and graduate students. Comprises two parts, lecture and lab, both of which are required and both of which are taught remotely by zoom this year. Lectures and lab demonstrations in the regional anatomy of the trunk and limbs as seen in pre-dissected human cadavers. Excludes the head & neck.

## **SURG 101A. Head and Neck Anatomy. 3 Units.**

Introduces students to human anatomy of the head and neck through a dissection based course. Students use proper anatomical terminology to describe structures and their relationships. Emphasis on typical anatomy as seen in healthy individuals, with some examples of anatomical variation introduced through dissection and clinical cases. Ideal for senior undergraduate students who have completed SURG 101 or equivalent, are familiar with basic anatomy, and have some dissection experience. Prerequisites: Surgery 101 or equivalent.

## **SURG 144. Athletes in Medicine at Stanford. 1 Unit.**

AIMS has been created as a supplemental resource for student-athletes who have an interest in pursuing a career in medicine. The goal of the class is to foster an intimate community of current and former Stanford student-athletes in nmedicine providing resources and guidance to allow individuals a chance to thrive in this challenging and rewarding field. This will be a credit/no credit seminar with a focus on exploring topics such as medical school applications, nplacement tests, research, and careers in medicine.

Same as: AIMS

## **SURG 150. Politics, Culture, and Economics of Global Surgery. 1-4 Unit.**

Focus is on understanding the growing role of surgery in international health, and to analyze the complex determinants of successful global surgery programs. Expert invited speakers highlight a variety of issues such as history, ethics, governance, and finances related to global surgery. Discussion and lab sessions cover basic clinical skills, needs finding, and creative problem solving. Students work in groups to complete a substantial final project on surgical program development. nnOption 1. Lecture only (1 unit). nnOption 2. Lecture series + discussions + workshops + team project 4 units. nnOpen to undergraduate, graduate and medical students.

Same as: SURG 250

## **SURG 199. Undergraduate Research. 1-18 Unit.**

Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

## **SURG 201. Embryology. 1 Unit.**

The course focuses on the structural development of the human body from embryo to fetus to early post-natal life. Topics include formation of the cardiovascular, respiratory, musculoskeletal, gastrointestinal, reproductive, and renal systems, as well as common clinical conditions which arise from abnormalities of development. Course open to MD, MSPA, and genetic counseling students only.

## **SURG 202A. Practical Applications for Qualitative Data Analysis. 3 Units.**

First quarter of a two-quarter course. Gain experience analyzing qualitative data using qualitative analysis software (i.e. Nvivo, Dedoose). Conduct analysis using your own or existing data sources. Explore multiple qualitative data analysis topics through class lectures, foundational readings and hands-on learning. Core topics include: grounded theory, qualitative data analysis approaches, software-based analysis, cleaning and coding of data, and interpreting data. Note: Preference will be given to medical students and undergraduate students that have successfully completed an introductory qualitative methods course. Enrollment in subsequent PEDS 202B required.

Same as: PEDS 202A

**SURG 202C. Qualitative Research Methods and Study Design. 2-3 Units.**

In-depth introduction to qualitative research methods and study design. Gain theoretical and practical knowledge necessary to design and implement a qualitative study. Explore qualitative methods through class lectures, foundational readings and hands-on learning. Core topics include: theoretical frameworks, research questions, methodological approaches (i.e. interviews, focus groups, participant observation, photovoice), data collection, sampling, reliability and validity, and IRB protocols. Students enrolled for 2-units participate in journal club-style discussions of literature employing qualitative methods to gain an appreciation for how qualitative projects are conducted, and what settings and research questions are relevant to qualitative inquiry. Students enrolled for 3-units plan and design an independent research project (i.e. Med Scholars, dissertation, honors thesis), receiving extensive support and feedback to further develop individual study designs and data collection instruments. Prerequisite: Consent from instructor for undergraduates.

Same as: PEDS 202C

**SURG 203. Clinical Anatomy. 11 Units.**

Introduction to human structure and function presented from a clinical perspective. Includes clinical scenarios, medical imaging techniques, and interventional procedures to illustrate the underlying anatomy. Course consists of lectures and dissection of the human body in the anatomy laboratory. Surgery 203 presents structures of the thorax, abdomen, pelvis, back, upper and lower limbs, and head & neck. Course opened to MD, MSM, and MSPA students only.

**SURG 204. Introduction to Surgery. 1 Unit.**

This lunch seminar is designed to give preclinical medical students a broad overview of surgical specialties and life as a surgeon. Interactive talks by leading surgeons from the General Surgery, Plastic Surgery, Neurosurgery, Orthopedic Surgery, Head and Neck Surgery, Transplantation Surgery, and Cardiac Surgery departments will highlight the array of operation types performed and diseases and conditions encountered in their disciplines. In addition, each lecturer will provide students with a road map as to how to successfully enter each specialty field of surgery. Lunch will be provided.

**SURG 205. Technical Training and Preparation for the Surgical Environment. 1 Unit.**

This course has been altered from previous years to follow the safety guidelines within COVID-19 regulations. This course is designed for preclinical students in the School of Medicine interested in acquiring the technical skills and clinical orientation necessary to learn and participate in the surgical environment. Students will begin with scrub training to learn sterile technique prior to participation in the operating room followed by basic surgical techniques (including knot tying, suturing, hand-sewn bowel anastomoses, and laparoscopic skills) to enhance their operating room experiences. In addition, the course will expose students to life as a surgeon. The class requires one to two mandatory operative shadowing experiences with an attending surgeon outside of normal class hours. Opportunities for one-on-one surgical faculty membership will be provided. This course will be held in person. Entry into the course: Second year students (MD, MS2) will get first priority, especially those who could not enroll in the course last year and those that plan on declaring a Surgery Scholarly Concentration. Due to organizational regulations, we are able to accommodate 8 students at this time, with the hope that we will offer this again after Winter Quarter. Indicate your interest in the course here: <https://forms.gle/jir2scgk3cy72Jdg9>. If selected for the course, you will be emailed a code that will allow you to register for the course on <https://explorecourses.stanford.edu>. All questions may be directed to [ischmied@stanford.edu](mailto:ischmied@stanford.edu) (Dr Ingrid Schmiederer, Education Fellow) or [misskay@stanford.edu](mailto:misskay@stanford.edu) (Ms Karen Cockerill, Coordinator). Confirmation of enrollment: If selected, students will be sent an enrollment code a week before classes start. Input the enrollment code when prompted on AXESS.

**SURG 208. Plastic Surgery Tutorial. 2 Units.**

Diagnosis, theory, and practice of plastic and reconstructive surgery. Limited to two students per faculty member.

**SURG 209. Plastic Surgery. 1-18 Unit.**

Students participate in plastic and reconstructive surgery as functioning members of the clinical team. Students are exposed to operative surgery, emergency and trauma care, evaluation of operative candidates in the outpatient setting, and also attend teaching conferences. Limited to four students. Prerequisite: completion of first year or clinical experience.

**SURG 214. Medical Etymology. 1 Unit.**

A survey of medical etymology and terminology that parallels preclinical medical education. Topics focus on Greek and Latin roots and their appearances in the medical lexicon.

**SURG 215. Cardiovascular Pathology. 2 Units.**

In this course we will review the basic anatomy, histology, and development of the cardiovascular system before moving on to explore various clinical pathologies including ischemic heart disease, aneurysm and dissection, cardiomyopathies and more. We will learn from a mix of short lectures and hands-on lab session with normal and abnormal cardiovascular pathology specimens.

**SURG 216. Introduction to Plastic and Reconstructive Surgery: From Head to Toe. 1-3 Unit.**

This course provides a broad overview of plastic and reconstructive surgery. Plastic surgery comes from the Greek word *plastikos*, which means that which can be shaped or molded. Indeed, plastic surgeons often perform procedures that shape and mold the human body. Although the popular media has portrayed plastic surgery as being only cosmetic surgery, the fact is that plastic surgery covers a broad range of procedures that span the entire human body from head to toe. The areas that will be covered during the course span the gamut of what plastic and reconstructive surgery really is, and this includes: Craniofacial surgery, Facial trauma, Skin Cancer, Oncoplastic surgery, breast reconstruction, hand surgery, lower extremity trauma and sarcomas, pelvic and genital reconstruction, abdominal wall reconstruction, chest wall reconstruction, burns, and multi-disciplinary reconstruction (i.e., working with orthopedics, oncology, trauma, cardiothoracic, gynecology, neurosurgery, dermatology, etc). The format of this course is lectures (Zoom) and student participation in discussions is encouraged. There are readings associated with each lecture that students will have the option to read since it is a lunchtime / brown-bag lecture with no additional requirements.

**SURG 221. Ultrasound Anatomy. 1 Unit.**

This elective course is designed to give medical students who have completed (or are enrolled simultaneously in) SURG 203, the opportunity to expand their knowledge of imaging anatomy, specifically ultrasound anatomy. Students will work in faculty guided teams to observe and complete ultrasounds examination of standardized patients. Lab sessions will be held on three specific Wednesdays (2:30-5:20pm) during Fall quarter. Each lab session will cover a specific anatomical region of interest, and will focus on technique, method, and interpretation of ultrasound images -normal and pathological. In the first session, students will be provided a detailed orientation of ultrasound machine functioning, and will cover thorax and upper limb. The second session will cover abdomen and pelvis. The third session will include lower limb and head & neck.

**SURG 230. Obesity in America. 1 Unit.**

Prevalence and effects of the obesity epidemic in America and the growing prevalence of associated comorbidities such as diabetes, hypertension, hyperlipidemia, sleep apnea, and joint problems. Risk factors, multi-disciplinary treatment options, the role of food in society, patients' perspectives, and current research in the field.

**SURG 233. Close Encounters, Distance Learning by Telemedicine. 1 Unit.**

Students will attend weekly lectures where they can meet and interact with telemedicine leaders who will deliver a 30-minute lecture followed by a 30-minute question and answer session. Course topics include: Present Landscape of Telemedicine in the XXI Century; Finding what is suitable to evaluate, diagnose and treat via Telemedicine; Challenges and opportunities of Telemedicine; Building a successful Telemedicine program; Telemedicine Business models; Ethics, Law and Telemedicine; Entrepreneurial opportunities in Telemedicine; Education in Telemedicine. All students are welcome regardless of their medical related experience.

**SURG 234. Service Through Surgery: Surgeons with an Impact. 1 Unit.**

Surgeons with an Impact is a weekly lunch seminar course with guest lectures and facilitated workshops with the following objectives: 1) Participants will be able to understand the role of surgeons in addressing health inequities, social justice, and poverty, 2) Participants will be exposed to the potential of expert surgeons through lectures from diverse professionals, 3) Participants will reflect on how addressing inequities can align with their career goals in surgery. Health justice topics covered will include: surgery and global health, advocacy and trauma surgery, transplant justice, inequities in pediatric surgery, serving veterans through surgery, accessing surgical obstetrics and gynecology care, women in surgery, LGBTQ advocacy and surgery, and race and surgery; as well as diversity among surgeons themselves. Course open to MD and PA students only.

**SURG 236. Seminar in Global Surgery and Anesthesia. 1-2 Unit.**

Providing safe, mutually beneficial, and sustainable surgical services in low-resource settings presents a unique set of considerations. This seminar, formatted as five two-hour sessions, will explore the background rationale for the evolving field of Global Surgery and discuss the unique implications surrounding implementation of global surgical programs. Course format will blend didactic presentation, discussion-based journal clubs, and case-based study. Topics covered will include the burden of surgical disease, human and infrastructure capacity building, outcomes, ethics/equity, economics, innovation/technology, volunteerism, training, safety, and research agenda. Instructors will provide mentorship to participants, helping them to formulate feasible research or potential MedScholar project.

**SURG 238. Practical Introduction to Clinical Research: A Primer by Surgeons Writing About Trauma. 1-2 Unit.**

This course is designed to accelerate students' readiness to conduct independent clinical research. We will provide pearls for every key research step, from idea generation to efficient manuscript writing. Topics ranging from data analysis pitfalls to writing effective cover letters will elevate students' academic productivity potential regardless of prior research background. Students will leave every lecture with practical skills to apply. For 2 units, students will draft and receive 1:1 feedback on a Med Scholars grant throughout the quarter, culminating in a grant proposal ready for submission to the Med Scholars committee.

**SURG 241. Portraiture and Facial Anatomy for Artists. 4 Units.**

Focus is on the art of portraiture and underlying structures of the face, fundamental anatomical elements such as the skull and muscles of facial expressions, and the intersections between human anatomy and art. Studio sessions incorporate plastic models, dry bones, cadaveric specimens, and live models. Encourages use of proper anatomical terminology for describing structures and their relationships.

Same as: ARTSTUDI 139

**SURG 242. Art and Anatomy Studio. 1 Unit.**

Lectures highlight the intersections and influences between human anatomy and art. Studio sessions provide an opportunity for students to immerse in anatomically inspired studio projects. Drawing, mixed media, and some painting mediums will be used during the studio sessions. Plastic models, dry bones, cadaveric specimens, and live models will be used for the studio sessions. Class time includes art instruction, creation and feedback. May be repeated for credit. Honing individual style is encouraged; both beginning and advanced students are welcome. Previous coursework in anatomy is recommended, but not required.

**SURG 243. Anatomy for Artists. 3 Units.**

Lectures highlight the intersections and influences between human anatomy and art. Studio sessions provide an opportunity for students to immerse in anatomically inspired studio projects. Drawing, mixed media, and some painting mediums will be used during the studio sessions. Plastic models, dry bones, cadaveric specimens, and live models will be used for the studio sessions. Class time includes art instruction, creation and feedback. May be repeated for credit. Honing individual style is encouraged; both beginning and advanced students are welcome. Same as: ARTSTUDI 243

**SURG 250. Politics, Culture, and Economics of Global Surgery. 1-4 Unit.**

Focus is on understanding the growing role of surgery in international health, and to analyze the complex determinants of successful global surgery programs. Expert invited speakers highlight a variety of issues such as history, ethics, governance, and finances related to global surgery. Discussion and lab sessions cover basic clinical skills, needs finding, and creative problem solving. Students work in groups to complete a substantial final project on surgical program development. nnOption 1. Lecture only (1 unit). nnOption 2. Lecture series + discussions + workshops + team project 4 units. nnOpen to undergraduate, graduate and medical students.

Same as: SURG 150

**SURG 254. Operative Anatomy and Techniques. 1 Unit.**

For preclinical students; provides a background in and integrates knowledge of surgical anatomy and therapy. Surgical or operative anatomy differs from gross anatomy in that the area exposed during surgery may be limited, the dissection may require exposing other seemingly unrelated anatomic structures with unique landmarks, and the procedure may require unusual technical facility. Provides an opportunity for students to understand the goals of representative surgical procedures (translating pathophysiology to surgical decision making to actual incision). Students learn surgical skills and perform the dissection of a number of commonly performed operations in the bio-skills laboratory. Emphasizes hands-on participation in surgical procedures in the laboratory and is taught by attending physicians in general, cardiothoracic, vascular, plastic, head and neck, urologic, and orthopedic surgery.

**SURG 255. (CASES) Clinical Anatomy and Surgical Education Series - Head and Neck. 1 Unit.**

This elective course for medical students, offered in the Spring quarter by the Division of Clinical Anatomy, builds on prior experiences in the first-year medical curriculum consisting of the required Clinical Anatomy (SURG 203) and the elective Operative Anatomy (SURG 254) courses. This course is created for students who want to expand their knowledge of human anatomy through the understanding of common conditions (disease, injury, genetic defects, etc.) affecting the head and neck, and their associated non-surgical and surgical treatments. Students will learn the tests involved in confirming the diagnosis of at least six common medical and dental conditions, the benefits and risks of the procedures to treat these conditions and the anatomy affected by the conditions and procedures. The focus will be on learning diagnostic and surgical skills and performing surgical procedures on lightly embalmed cadaver specimens. Course coordinators and guest speakers are clinical specialists in the areas of oral surgery, maxillofacial surgery, ophthalmic surgery, ENT surgery and neurosurgery. The class is limited to 6 students.

**SURG 256. (CASES) Clinical Anatomy and Surgical Education Series - Torso and Limbs. 1 Unit.**

This elective course for medical students, offered in the Fall quarter, by the Division of Clinical Anatomy, builds on prior experiences in the first-year medical curriculum consisting of the required Clinical Anatomy (SURG 203) and the elective Operative Anatomy (SURG 254) courses. This course is created for students who want to expand their knowledge of human anatomy through the understanding of common conditions (disease, injury, genetic defects, etc.) affecting the torso and limbs, and their associated non-surgical and surgical treatments. Students will learn the tests involved in confirming the diagnosis of at least six common medical conditions, the benefits and risks of the procedures to treat these conditions and the anatomy affected by the conditions and procedures. The focus will be on learning diagnostic and surgical skills and performing surgical procedures on lightly embalmed cadaver specimens. Course coordinators and guest speakers are clinical specialists in the areas of orthopedic surgery, abdominal surgery, thoracic surgery and neurosurgery. The class is limited to 6 students.

**SURG 271. Anatomy of Medical Mysteries. 1 Unit.**

This elective course for medical students explores areas of health and disease that are poorly understood presently. A variety of topics are covered such as placebo effect, techniques of meditation, presence of extra-sensory perception, and near death experiences. Scientific evidence for and against these topics presented and discussed. Current literature is evaluated and reading assignments are included. Pre-requisites: SURG 203A and SURG 203B.

**SURG 280. Early Clinical Experience in Surgery. 1 Unit.**

Provides students an opportunity to see patients, and correlate clinical findings with preclinical coursework. Students spend a half day, twice monthly, in a general surgery clinic. Students participate in conferences, shadow peers, and accompany attending physicians. Open to 1st year MD candidates only. 2 quarter commitment required. Prerequisites: Co-enrollment in INDE 290.

**SURG 296. Individual Work: Human Anatomy. 1-18 Unit.**

Carried out under the supervision of one or more members of the staff. Prerequisite: consent of instructor.

**SURG 298. Procedure-Based Specialty Capstone Course. 1 Unit.**

Designed for graduating medical students entering a procedure-based internship or residency (e.g. general surgery, surgical sub-specialties, obstetrics-gynecology, anesthesia, and emergency medicine). Prepares students with practical, high-yield clinical and procedural skills. Clinical skills include fielding common calls regarding surgical patients, obtaining informed consent, completing operative dictations, discharging patients, writing prescriptions, running trauma surveys, and interpreting surgically relevant radiology studies. The hands-on portion of the course covers basic open and laparoscopic surgical skills utilizing bench models, laparoscopic box trainers, and full cadaveric simulations. Prerequisite: graduating medical student. For those students who are not enrolled for the quarter in which this Capstone Course is offered, please contact Karen Cockerill at [misskay@stanford.edu](mailto:misskay@stanford.edu) to register.

**SURG 299. Directed Reading in Surgery. 1-18 Unit.**

Consists of studies in progress, including cardiovascular and circulatory problems; gastric physiology; hemostatic disorders; homotransplantation; liver disorders; orthopedic pathology; bone growth; radiation injury; immunology, bacteriology, pathology, and physiology of the eye; physiological optics; comparative ophthalmology; neurophysiology of hearing; spatial orientation and disorientation; nasal function; and psychophysics of sensation. Prerequisite: consent of instructor.

**SURG 300A. Surgery Core Clerkship. 10 Units.**

VISITING: Closed to visitors. TYPE OF CLERKSHIP: Required. DESCRIPTION: Provides students with clinical experience in the evaluation and treatment of a wide variety of surgical diseases. Emphasis is placed on teaching students to recognize and manage basic clinical problems. Students function as active members of the surgical team, and follow patients throughout their in-patient course. Outpatient clinics provide the student with the ability to participate in the initial work-up and care plan of peri-operative patients. Basic surgical skills are taught in the operating room, in the emergency department setting, and in the Goodman Surgical Education Center. The clerkship offers an opportunity for students to integrate their knowledge of anatomy, physiology and physical diagnosis into a treatment plan for patients with surgical diseases. A blended learning curriculum is in place for all students at all sites. It combines case discussions with video pre-session material and related skills sessions. This curriculum covers the diagnosis and treatment of various diseases and principles of surgical management. A required textbook will be provided. Each student spends one 4 week rotation on a General Surgery rotation at Stanford, the VA, Kaiser, or SCVMC. The remaining 4 weeks will be spent rotating on a Surgical Subspecialty; Breast Service, Endocrine, ENT, Orthopaedic, Pediatric, Plastic Surgery, Thoracic Transplant, Trauma, Urology, or Vascular. A half day orientation is held at the beginning of the 8 week period. The NBME Subject Exam is a required component of the clerkship. PREREQUISITES: None. PERIODS AVAILABLE: 1-12, full-time for 8 weeks, 18 students per period. CLERKSHIP DIRECTOR: Khoa Thomas Pham, M.D., 650-498-5689 and Cara A. Liebert, M.D., [carap@stanford.edu](mailto:carap@stanford.edu). CLERKSHIP COORDINATOR: Karen Cockerill, 650-498-6052, Department of Surgery, 300 Pasteur Drive, H3658. REPORTING INSTRUCTIONS: Where: Students will be sent information by e-mail; Time: TBA. CALL CODE: 1. OTHER FACULTY: Staff. LOCATION: SUMC, PAVAMC, SCVMC, KPMC.

**SURG 301A. Dental Medicine and Surgery Clerkship. 5 Units.**

VISITING: Open to visitors. TYPE OF CLERKSHIP: Elective. DESCRIPTION: Stanford Plastic Surgery's Dental Section offers a 4-week clerkship for 3rd and 4th year medical and dental students interested in learning more about dental medicine and surgery, Residents (typically ED, ENT, Anesthesia, ID, Path). The rotation offers a broad exposure to the many different clinical facets of dental medicine and surgery from dentoalveolar trauma to clearance of oral infection prior to cancer treatment, transplants, or cardiac devices. Students will also have the opportunity to work in a variety of practice settings. The rotation consists of two week rotations that take place in Stanford Hospital and the Dental Medicine and Surgery/Oral and Maxillofacial Surgery Clinic. Clerkship includes time in Clinic on Welch Road and at RWC campus, as well as in OR & ED, along with in hospital consults. Students will meet and work with faculty from these sites. The students will work as members of the clinical teams and participate in the clinical care of dental surgery patients. Four week schedule will be distributed prior to first day of clerkship. PREREQUISITES: Dental or medical school student in 3rd or 4th year. PERIODS AVAILABLE: 1-12, full-time for 2 weeks or 4 weeks, 2 students per period. CLERKSHIP DIRECTOR: Gary Roberts, DDS, [groberts@stanford.edu](mailto:groberts@stanford.edu), 650-723-5824. CLERKSHIP COORDINATOR: Ariel Chou, [frchou@stanford.edu](mailto:frchou@stanford.edu), 650-497-3962. REPORTING INSTRUCTIONS: Where: Meet with Dr. Roberts or designated dental faculty to touch base at 1st floor of Blake Wilbur; Time: 7:00 AM. CALL CODE: 2- Rotating Residents and Fellows will likely share some call depending on the set call schedule. Rotating Students will have the option to share call, but will not be primary. OTHER FACULTY: Staff. LOCATION: SUMC.

**SURG 310E. Hand and Microsurgery Clerkship. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Elective. **DESCRIPTION:** The Buncke Clinic at California Pacific Medical Center (CPMC), Davies Campus in San Francisco, is an internationally recognized leader in the field of hand and microsurgery. Our clerkship emphasizes a multidisciplinary approach to complex reconstructive problems such as facial reanimation, functional muscle transplantation, and replantation, which often require staged microsurgical solutions. The student will play an integral role in acute admissions, new admissions and daily patient rounds. Considerable emphasis is placed on teaching and strategy sessions. All students are required to participate in weekly journal clubs, patient conferences, and resident teaching presentations. Combined Buncke/UCSF Plastic and Hand Surgery Conferences are held on the first and third Tuesdays of each month. Students also have the opportunity to participate in the microsurgery laboratory to improve microsurgical skills or participate in multiple ongoing research projects. **PREREQUISITES:** Surgery 300A. **PERIODS AVAILABLE:** 1-12, full-time for 2 weeks or 4 weeks, 1-2 students per period. **CLERKSHIP DIRECTOR:** Greg Buncke, M.D. **CLERKSHIP COORDINATOR:** Collen Fuller, 415-565-6136. **REPORTING INSTRUCTIONS:** Where: Contact coordinator for reporting instructions; Time: TBA. **CALL CODE:** 0. **OTHER FACULTY:** R. Buntic, W. Lin, B. Safa, A. Watt. **LOCATION:** Buncke Clinic.

**SURG 311C. Clerkship at the Burn Center. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Selective 2. **DESCRIPTION:** Provides integrated patient care, from intensive care to outpatient care. Acute, rehabilitative, and reconstructive phases are seen and treated. Students work directly with a PGY-3 plastic surgery resident and the ICU nursing staff. This rotation is designed for the student with career goals in general or plastic surgery, emergency medicine, or intensive care work (e.g., anesthesiology). However, students interested in primary care or pediatrics will benefit greatly from this experience. Direct surgical experience in the operating room is guaranteed. **PREREQUISITES:** None. **PERIODS AVAILABLE:** 1-12, full time for 4 weeks, 1 student per period (will consider 2). **CLERKSHIP DIRECTOR:** Yvonne Karanas, M.D. **CLERKSHIP COORDINATOR:** Desiree Fuentez, 408-885-5315, SCVMC, 751 S. Bascom Avenue, Building Q, Suite 4Q265, San Jose, CA 95128. **REPORTING INSTRUCTIONS:** Where: SCVMC, Plastic Surgery Office [Visitors must sign-in on the first day of rotation @ VSC Registration Desk 410]; Time: 8:00 am. **CALL CODE:** 2 - Taking call and weekend rounding will enhance the student's learning experience dramatically. It is left up to each student to decide if and how often they will take call. **OTHER FACULTY:** Y. Karanas. **LOCATION:** SCVMC.

**SURG 316A. Pediatric Surgery Clerkship. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Selective 2. **DESCRIPTION:** Designed to familiarize the student with the general scope of pediatric surgery ranging from neonatal surgery for congenital malformations, pediatric emergency and ambulatory surgery, and identification and management of common pediatric conditions (hernias, hydroceles, pyloric stenosis, appendicitis) management of the pediatric trauma patient, management of pediatric solid tumors and pediatric laparoscopic and thoracoscopic surgery. The student will be expected to assume supervised responsibility for inpatients, to evaluate consultations in the emergency department, and to participate in outpatient clinics, weekly conferences, daily surgeries and teaching rounds. **PREREQUISITES:** Pediatrics 300A or Surgery 300A. **PERIODS AVAILABLE:** 1-12, full time for 4 weeks, 1 student per period. **CLERKSHIP DIRECTOR:** Julie Fuchs, M.D., 650-384-9463. **CLERKSHIP COORDINATOR:** Vicente Marcelo, vmarcelo@stanford.edu, Division of Pediatric Surgery, 300 Pasteur Drive, Alway M116. **REPORTING INSTRUCTIONS:** Where: Please email Vicente Marcelo 2 weeks before start date for reporting instructions. Pediatric Surgery office, 300 Pasteur Drive, Alway M116. Report to Vicente Marcelo on Mondays at 8:30 am for orientation packets; Time: 8:30 am. **CALL CODE:** 1. **OTHER FACULTY:** M. Bruzoni, S. Chao, B. Chiu, J. Dunn, J. Fuchs, G. Hartman, C. Mueller, S. Shew, K. Sylvester, J. Wall. **LOCATION:** LPCH.

**SURG 317A. Pediatric Surgical Specialties Clerkship. 5 Units.**

**VISITING:** Closed to visitors. **TYPE OF CLERKSHIP:** Elective. **DESCRIPTION:** Two one-week rotations selected from: general pediatric surgery, otolaryngology, orthopedics, urology, plastics/craniofacial, ophthalmology, neurosurgery. Exposes students to common as well as unique developmental and congenital pediatric surgical diseases. Includes daily rounds, clinics, operating room, as well as one day per week with pediatric anesthesia to understand immediate pre- and post-operative care of surgical pediatric patients. Broad exposure to each of the specialties familiarizes students with the spectrum of practice and the specialized physical diagnosis in these areas. **PREREQUISITES:** Surg 300A (or by permission). **PERIODS AVAILABLE:** 1-12, full time for 2 weeks or 4 weeks, 1 student per period. **CLERKSHIP DIRECTOR:** Julie Fuchs, M.D., 650-384-9463. **CLERKSHIP COORDINATOR:** Vicente Marcelo, vmarcelo@stanford.edu, Division of Pediatric Surgery, 300 Pasteur Drive, Alway M116. **REPORTING INSTRUCTIONS:** Where: Please email Vicente Marcelo 2 weeks before start date for reporting instructions. Students will be notified by email in advance of clerkship start; Time: TBA. **CALL CODE:** 0. **OTHER FACULTY:** K. Chang, D. Fredrick, R. Guzman, W. Kennedy, C. Kuan, P. Lorenz, L. Rinsky. **LOCATION:** LPCH.

**SURG 319A. Introduction to Plastic and Reconstructive Surgery Clerkship. 5 Units.**

**VISITING:** Closed to visitors. **TYPE OF CLERKSHIP:** Elective. **DESCRIPTION:** This clerkship is meant for those students who did not have the opportunity to rotate on the hand/plastic surgery service during their core surgery clerkship. This clerkship will introduce students to plastic and reconstructive surgery. Plastic Surgery encompasses a broad field and has been described as operating on the "skin and its contents." Students will be part of the team in managing patients both in the inpatient as well as outpatient setting. Students will participate in daily rounds and have direct patient care responsibilities. Students will assist in the Operating Room and learn fundamental suturing skills. Students will work in the clinic to understand the indications and contraindications to plastic surgery, and also about how to discuss surgical procedures with patients and families. **PREREQUISITES:** Completion of core surgical clerkship (Surg 300A). **PERIODS AVAILABLE:** 6-11, full-time for 2 weeks, 2 students per period. **CLERKSHIP DIRECTOR:** Catherine Curtin, M.D. **CLERKSHIP COORDINATOR:** Angela Sotelo, 650-723-5824, 770 Welch Road, 4th Floor, Palo Alto, CA 94304. **REPORTING INSTRUCTIONS:** Where: Contact coordinator two weeks prior; Time: TBA. **CALL CODE:** 0. **OTHER FACULTY:** K. Bruckman, J. Chang, C. Curtin, P. Fox, G. Gurtner, D. Kahn, R. Khosla, G. Lee, P. Lorenz, A. Momeni, R. Nazerali, D. Nguyen, S. Sen, D. Wan. **LOCATION:** SUMC, LPCH.

**SURG 333A. Multi-Organ Transplantation Clerkship. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Selective 2. **DESCRIPTION:** Will expose the student to transplantation of the liver, kidney, and pancreas. The student will become familiar with the selection criteria for accepting patients as candidates for transplantation. In addition, the principles of immunosuppression, histocompatibility, opportunistic infection and critical care of transplant recipients will be emphasized. The student will participate in multi-disciplinary evaluation of transplant candidates, daily transplant rounds, perioperative care and outpatient follow-up. The student will accompany the transplant team for deceased organ procurements. A weekly transplantation conference will review pertinent literature. **PREREQUISITES:** Surgery 300A. **PERIODS AVAILABLE:** 1-12, full time for 4 weeks, 1 student per period. **CLERKSHIP DIRECTOR:** Carlos O. Esquivel, M.D., Ph.D. **CLERKSHIP COORDINATOR:** Gioia Zucchero (650-498-5689 or gioia@stanford.edu), 750 Welch Rd., Suite 319. **REPORTING INSTRUCTIONS:** Where: 750 Welch Rd., Suite 200 (Transplantation Fellow; call two weeks prior to confirm time of rounds); Time: 7:00 am. **CALL CODE:** 3. **OTHER FACULTY:** A. Bonham, S. Busque, C. Esquivel, A. Gallo, M. Melcher, T. Pham. **LOCATION:** SUMC.

**SURG 334A. Advanced Vascular Surgery Clerkship. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Selective 2.  
**DESCRIPTION:** This intensive sub-internship provides a focused study of disease processes of contemporary vascular surgery. This includes problems related to lower extremity occlusive disease, arterial aneurysms, cerebrovascular problems, and venous disorders. There is a special emphasis on preoperative patient assessment both clinically and radiographically. The student will be exposed to the management of vascular patients by both traditional open techniques and cutting edge minimally-invasive endovascular routes. Extensive operative experience in the hybrid operating room and the angiography suite is provided. Procedures include diagnostic arteriography, arterial and venous reconstruction, aortic endografting, limb salvage, carotid interventions, and other advanced catheter-based interventions. The student will be an integral part of the vascular surgery service and work alongside interns, vascular surgery residents, and the vascular fellows. Weekly attendance at surgical and multidisciplinary conferences at SUMC is required. Note for visiting students: this course is principally directed at students who are seriously considering a career in vascular surgery and will be applying for integrated vascular surgery residency. If any questions, contact Venita Chandra, M.D., Department of Surgery, Division of Vascular Surgery, 300 Pasteur Drive, Always M121S, Stanford, CA 94305-5642. Email: vchandra@stanford.edu. \*Please note: Visiting students must obtain approval from Ms. Karen Cockerill prior to applying for this clerkship. Please email requests to karen.cockerill@stanford.edu. **PREREQUISITES:** Surgery 300A. **PERIODS AVAILABLE:** 1-12, full-time for 4 weeks, 2 students per period. **CLERKSHIP DIRECTOR:** Venita Chandra, M.D. **CLERKSHIP COORDINATOR:** Karen Cockerill, 650-498-6052, Department of Surgery, 300 Pasteur Drive, H3658. **REPORTING INSTRUCTIONS:** Where: Call Karen Cockerill at 650-498-6052 two weeks prior. Students will be sent information by email; Time: TBA. **CALL CODE:** 1. **OTHER FACULTY:** V. Chandra, R.L. Dalman, E.J. Harris, Jr., J.T. Lee, E. Ross, J. Stern. **LOCATION:** SUMC.

**SURG 338A. Advanced Surgery Clerkship. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Selective 2.  
**DESCRIPTION:** Allows a student to function as surgical interns, but with reduced patient loads. This surgical sub-internship curriculum is designed to provide senior medical students with the skills and knowledge necessary to function as an intern. The curriculum focuses on practical skills, including wound care and bedside procedures, and intern-level floor management, from writing orders to managing pages from nurses. Students are assigned to one of the general surgery teams at Stanford Hospital. The student will be fully integrated to the service and expected to participate in all teaching conferences and grand rounds. The student will have meetings with the course director. The student must have successfully completed Surgery 300A or the equivalent. Note for visiting students: this course is principally directed at students who are seriously considering a surgical career. \*Please note: Visiting students must obtain approval from Ms. Karen Cockerill prior to applying for this clerkship. Please email requests to karen.cockerill@stanford.edu. **PREREQUISITES:** Surgery 300A. **PERIODS AVAILABLE:** 1-12, full-time for 4 weeks, 3 students per period. **CLERKSHIP DIRECTORS:** Khoa Thomas Pham, M.D., tpham03@stanford.edu and Cara A. Liebert, M.D., cara.liebert@stanford.edu. **CLERKSHIP COORDINATOR:** Karen Cockerill, 650-498-6052, Department of Surgery, 300 Pasteur Drive, H3658. **REPORTING INSTRUCTIONS:** Where: Call Karen Cockerill at 650-498-6052 at least two weeks prior; Students will be sent information by email; Time: TBA. **CALL CODE:** 3. **OTHER FACULTY:** Staff. **LOCATION:** Stanford Hospital.

**SURG 339A. Plastic Surgery Subinternship. 5 Units.**

**VISITING:** Open to visitors. **TYPE OF CLERKSHIP:** Selective 2.  
**DESCRIPTION:** This is a 4-week intensive sub-internship experience. Students should have completed Core Surgery, and this rotation is specifically for students who intend to pursue a career in surgery or subspecialty. Students will have responsibility in the inpatient wards with direct patient care responsibilities and manage patients post-operatively. Students will also spend approximately 20% of time in the clinic evaluating patients preoperatively and performing appropriate work up and exam, and also evaluate patients post-operatively for long-term follow up and outcomes (continuity). Students will be an integral part of the resident team and function at the level of an intern. Students will spend significant time in the OR as an assistant, and develop competency in fundamental suturing and surgical wound closures. Students will be expected to present cases (1-2) at case conferences per week, and culminate in an Oral Presentation on a topic in plastic surgery at the end of the rotation. Students will take home call once per week to learn how to manage emergencies and patient phone calls. There is no exam. Students will work primarily with the Clerkship Director, but may also have exposure to all of the other faculty in Plastic Surgery. Involves clinical participation in plastic and reconstructive surgery. Activities include exposure to operative surgical techniques, evaluation of operative problems, trauma and emergency, facial and hand trauma, burns, soft tissue tumors, congenital malformations, and a broad range of rehabilitative problems. The sub-I requires rotating to affiliated sites as well as work at SUMC (automobile transportation essential). Please note: Visiting students must obtain approval from Ms. Angela Sotelo prior to applying for this clerkship. Please email requests to asotelo@stanford.edu. Visiting students wishing to do a Plastic Surgery clerkship in periods 1-7 usually apply to the residency program in Plastic Surgery. Please note that this rotation will be purely educational rotation and will not serve as your interview. Please see the Plastic Surgery website at <http://plasticsurgery.stanford.edu> for more information. **PREREQUISITES:** Surgery 300A. If you are a fourth year medical student interested in plastic surgery as a residency, you should do this clerkship within the six months prior to applying for residency. **PERIODS AVAILABLE:** 1-12, full-time for 4 weeks. 6 students per period. We encourage students who are interested in an educational clerkship and who are not applying to the residency program to take the clerkship in periods 7-12. **CLERKSHIP DIRECTOR:** Catherine Curtin, M.D. **CLERKSHIP COORDINATOR:** Angela Sotelo, 650-725-7181, 770 Welch Road, 4th Floor, Palo Alto, CA 94304. **REPORTING INSTRUCTIONS:** Where: To be assigned. The coordinator will contact you a week before your start date for instructions; Time: TBA. **CALL CODE:** 2 (1-2 nights). **OTHER FACULTY:** K. Bruckman, J. Chang, C. Curtin, D. Davis, P. Fox, D. Gupta, G. Gurtner, D. Kahn, Y. Karanas, R. Khosla, G. Lee, P. Lorenz, R. Menard, A. Momeni, M. Murphy, R. Nazerali, D. Nguyen, J. Orman, S. Sen, T. Theman, D. Wan. **LOCATION:** SUMC, SCVMC, KPMC.

**SURG 340A. Surgical Intensive Care Unit Clerkship. 5 Units.**

VISITING: Open to visitors. TYPE OF CLERKSHIP: Elective. DESCRIPTION: This clerkship provides experience managing critically ill surgical patients. The caseload is drawn from the ICU patients of the general and trauma surgery services at Stanford Hospital. The student works closely with the course site director, senior surgery residents, and surgical critical care fellows to provide care for patients in the K4 Stanford 500P ICU. Daily attending rounds help the student to master the following topics: mechanical ventilators, vasoactive drugs (pressors and inotropes), fluid resuscitation, shock, oxygen transport, systemic inflammatory response syndrome, ARDS, multiple organ failure, enteral and parenteral nutrition (TPN), and weaning from the ventilator. Students are expected to function at the manager level and will be given increasing levels of autonomy throughout the clerkship period. The student also participates in the resuscitation and operative management of trauma patients. Students will have opportunities to learn procedures commonly performed for critically ill surgical patients including arterial lines, central lines, and chest tubes. The student also participates in the resuscitation and operative management of trauma patients. Students will be given the opportunity to care for their patients in the ICU in addition to participating in operating room procedures required for their assigned patients. Students will participate in bedside sedation procedures with the perioperative anesthesia service as needed for the care of their patients. Students wishing to do this clerkship must get approval from Bernadette Carvalho at berniec@stanford.edu first before registering. PREREQUISITES: Anesthesia 306A for Stanford medical students; Surgery core clerkship for visiting students. PERIODS AVAILABLE: 1-12, full-time for four or 8 weeks, 1 student per period. CLERKSHIP DIRECTOR: Erin Hennessey, M.D. CLERKSHIP COORDINATOR: Bernadette F. Carvalho, berniec@stanford.edu. REPORTING INSTRUCTIONS: Where: M114; Time: 7:00 am. CALL CODE: 4. OTHER FACULTY: D. Spain, P. Maggio, J. Lorenzo, J. Forrester, K. Staudenmayer, L. Knowles, and P. Mohabir. LOCATION: SUMC.

**SURG 340B. Medical-Surgical Intensive Care Unit Clerkship. 5 Units.**

VISITING: Open to visitors. TYPE OF CLERKSHIP: Elective. DESCRIPTION: This clerkship provides experience managing adult patients in a critical care unit. Students learn how to optimize care for the acutely ill patient and the multidisciplinary approach to complex patients. Teaching emphasizes the review of basic organ physiology, the ability to determine the pathophysiologic mechanisms involved in critical illness, and the formulation of a physiologic based treatment plan. Students gain experience with the implementation of monitoring and therapeutic devices used in the intensive care units and begin to become adept at the evaluation, stabilization and management of the most critically ill patients expected to be encountered in today's acute care hospitals. Ward rounds, bedside evaluation and treatment, and individual interactions with attending, fellows and residents are part of the educational process. Students must attend mandatory simulator courses in order to receive passing grade for this clerkship. Students wishing to do this clerkship must get approval from Bernadette Carvalho first before registering. Students must register for Anes 340B for this clerkship. PREREQUISITES: Anesthesia 306A or Medicine and Surgery core clerkships. PERIODS AVAILABLE: 1-12, full-time for 4 weeks, 1 student per period. CLERKSHIP DIRECTOR: Juliana Barr, M.D. (650-493-5000 x64452), Building 1, Room F315, PAVAMC (112A). CLERKSHIP COORDINATOR: Bernadette F. Carvalho (berniec@stanford.edu). REPORTING INSTRUCTIONS: Where: PAVAMC, MSICU, 3rd Floor; Time: 8:00 am. CALL CODE: 4. OTHER FACULTY: E. Bertaccini, R. Chitkara, G. Lighthall, W. Kuschner, G. Krishna, J. Olsson. LOCATION: PAVAMC.

**SURG 370. Medical Scholars Research. 4-18 Units.**

Provides an opportunity for student and faculty interaction, as well as academic credit and financial support, to medical students who undertake original research. Enrollment is limited to students with approved projects.

**SURG 398A. Clinical Elective in Surgery. 5 Units.**

VISITING: Closed to visitors. TYPE OF CLERKSHIP: Elective. DESCRIPTION: Provides an opportunity for a student in the clinical years to have an individualized clinical experience in one of the fields of Surgery. The quality and duration of the elective will be decided by both the student and a faculty preceptor in the Department of Surgery. Please note: Students cannot add 398A clerkships directly to their fishbowl schedules through the regular shuffles. Please contact Caroline Cheang in the Office of Medical Student Affairs at cheang@stanford.edu or 650-498-7619 with the faculty preceptor's name and email address to add this clerkship. PREREQUISITES: None. PERIODS AVAILABLE: 1-12, full time for 4 weeks, 4 students per period. CLERKSHIP DIRECTOR: Khoa Thomas Pham, M.D., 650-498-5689. CLERKSHIP COORDINATOR: Karen Cockerill, 650-498-6052, Department of Surgery, 300 Pasteur Drive, H3658. REPORTING INSTRUCTIONS: Where: TBA (designated faculty preceptor); Time: TBA. CALL CODE: 2. OTHER FACULTY: Staff. LOCATION: SUMC, LPCH, PAVAMC, SCVMC.

**SURG 399. Graduate Research. 1-18 Unit.**

Students undertake investigations sponsored by individual faculty members.

**SURG 52Q. Becoming whatever you want to be: lessons learned from a stem cell. 4 Units.**

Stem cells are extreme: they are the most powerful cells in our body and yet they are unimaginably scarce; they exist in nearly every tissue but actually locating them is enormously challenging. We believe that stem cells have the potential to transform the way we practice medicine, while at the same time their potential application to human disease continues to spark political debates around the world. My laboratory at Stanford works on this remarkable cell, and we believe that they hold answers to some of the pressing questions about the potential for tissue healing and regeneration in our bodies. Come join us in this conversation about stem cells, and both the hype and hope that surrounds their application to medical practice. While we will be focusing on the human body, we encourage participation from those students whose fields of interest fall well outside HumBio. Engineers, artists, historians, writers, economists--all will find intersections between the course subject matter, and their own interests. In this virtual class, we'll be taking advantage of a number of online tools including Zoom, Canvas, and Slack. Group work will figure prominently into this course, and we'll discuss and agree upon team charters to facilitate those collaborations. Finally, I recognize the challenge of bringing this class into a virtual world. There are plenty of obstacles to distance learning: You might struggle to understand an assignment. You might find it is easy to be distracted. You might have an unreliable internet. I'm here to tell you: we're in this together. We're navigating uncharted territory here! That means we're going to think creatively, we're going to speak up when we have questions or ideas or complaints or objections. We're going to learn and problem-solve and create like we've never learned or problem-solved or created before. And when we fail, we'll try again. Come join us!

**SURG 68Q. Current Concepts in Transplantation. 3 Units.**

Preference to sophomores. Biological aspects of cell and organ transplantation, including issues that arise in the popular media. Diseases for which transplantation is a treatment, the state of the art in human transplantation, transplantation of animal tissue into humans (xenotransplantation), development of new tissue and organs in the laboratory (tissue engineering and cloning), and development of drugs and biological strategies to promote long-term survival of the tissue or organ (tolerance). How to write a scientific abstract, critique scientific literature, and research and present topics in contemporary transplantation.

**SURG 70Q. Surgical Anatomy of the Hand: From Rodin to Reconstruction. 2 Units.**

The surgical anatomy of the hand is extremely complex in terms of structure and function. Exploration of the anatomy of the hand in different contexts: its representation in art forms, the historical development of the study of hand anatomy, current operative techniques for reconstruction, advances in tissue engineering, and the future of hand transplantation.

**SURG 72Q. Anatomy and Design Innovations. 3 Units.**

Preference to Sophomores. This Introductory Seminar is for undergraduates who want to expand their understanding of the influence of human anatomy on the design of commercial products and prosthesis, and the performance of core strengthening exercises, such as: automobile interior design, headphones and ear buds design, exoskeletons and yoga/Pilates. Students will learn how societal advancements have evolved to increasingly accommodate human form and function. Guest speakers are experts in their fields of design, prosthetics and exercise. The laboratory component exposes students to human anatomy via cadaver material, 3D digital images, the 3D anatomy table, apps and models. By the end of this course, students will be able to: describe the concepts of anatomically correct automotive interior design; explain how properly designed head phones and ear buds aid in sound detection; explain how thoughtfully choreographed yoga and Pilates movements incorporate proper joint and muscle movement; explain how properly designed joint prosthesis aids in joint movement and muscle function; and, deliver group presentations using proper communication skills. The class is limited to 14 students.