SURGERY (SURG)

SURG 100A. Virtual and Real: Clinical 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 clinical conditions and sports injuries. 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 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 clinical conditions and sports injuries; and, student projects will focus on the understanding of the anatomy and treatment of these conditions and injuries.

SURG 100B. Virtual And Real: Clinical Anatomy And Sports 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 clinical conditions and sports injuries of the head and neck. To aid students in developing interpreting 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 body into four 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 the knowledge in the interpretation of radiographs, CT scans and MRIs. The anatomy will be taught in relation to common clinical conditions and sports injuries; and, student projects will focus on the understanding of the anatomy and treatment of these conditions and injuries.

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. Lectures in regional anatomy and dissection of the human cadaver; the anatomy of the trunk and limbs through the dissection process, excluding the head and 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 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. nOption 1. Lecture only (1 unit). nOption 2. Lecture series + discussions + workshops + team project 4 units. nOpen 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 and MSPA students only.

SURG 202A. Practical Applications for Qualitative Data Analysis. 2-3 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 202B. Practical Applications for Qualitative Data Analysis. 2-3 Units.
Second quarter of a two-quarter course provides hands-on experience summarizing qualitative data and describing findings for dissemination. Final course product will be a draft manuscript for submission with students listed as co-authors. Core topics include: identifying themes and representative quotes, community-engaged dissemination, abstract submission, posters, oral presentations, manuscript writing, and journal selection. Prerequisite: Successful completion of PEDS 202A. Same as: PEDS 202B

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 open 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 is designed for preclinical medical students interested in acquiring the technical skills and clinical orientation necessary to learn and participate in the surgical environment. The course begins with scrub training to teach sterile technique, which is required prior to participation in the operating room. Students will also learn surgical techniques (including basic knot tying, suturing, hand-sewn bowel anastomoses, and basic laparoscopic skills) to enhance their operating room experiences. Students will be exposed to these technical aspects of surgery as well as the life of a surgeon through one-on-one surgical faculty membership.

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 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 231. Healthcare in Haiti and other Resource Poor Countries. 1 Unit.
Originally developed to highlight healthcare in extreme poverty in Haiti, related lectures have been added covering healthcare in resource poor environments with the objective to introduce students to the complexity and unique problems of working in the Third World's healthcare morass.

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 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. Topic covered will include; building diversity in surgery, inequities in pediatric surgery, immigration and surgery, access to colorectal surgery, Medecins Sans Frontieres, surgery and global health, policy advocacy and surgery, LGBTQ advocacy and surgery, inequities and neurosurgery, women in surgery, transplant justice, and race and surgery. 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 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. nOption 1. Lecture only (1 unit). nOption 2. Lecture series + discussions + workshops + team project 4 units. nOpen to undergraduate, graduate and medical students.
Same as: SURG 150

SURG 251A. Imaging Anatomy. 1 Unit.
Accompanies existing clinical anatomy course for first year medical students (SURG 203A). Sessions focus on the anatomical region being taught and dissected during the same week in SURG 203A. Students revisit anatomy using a variety of basic and advanced imaging modalities. Emphasis on correlating imaging to dissection, studying anatomical variations, discussing clinical vignettes. Enrollment limited to MD students.

SURG 251B. Imaging Anatomy (Head & Neck) II. 1 Unit.
Accompanies existing clinical anatomy course for first year medical students (SURG 203B) concentrating on the head and neck region. Sessions focus on the anatomical region being taught and dissected during the same week in SURG 203B. Students revisit anatomy using a variety of basic and advanced imaging modalities. Emphasis on correlating imaging to dissection, studying anatomical variations, discussing clinical vignettes. Enrollment limited to MD students.

SURG 252. Bedside Anatomy. 1 Unit.
Provides an opportunity to revisit anatomy in a clinical context. Using case discussions, clinical vignettes, radiological imaging, and hands-on exercises, students are challenged to apply their knowledge of anatomy to explain common diagnostic maneuvers and interventional procedures performed at the bedside or in the outpatient setting. Emphasis will be on anatomical considerations in successfully performing these procedures and avoiding errors that may arise due to anatomical changes, oddities, or variations.

SURG 253. Topics in Simulation of Human Physiology & Anatomical Systems. 1 Unit.
Biweekly interdisciplinary lecture series on the development of computational tools for modeling and simulation of human physiological and anatomical systems. Lectures by instructors and guest speakers on topics such as surgical simulation, anatomical & surgical Modeling, neurological Systems, and biomedical models of human movement. Group discussions, team based assignments, and project work nPrerequisite: Medical students, residents or fellows from school of medicine, and computationally oriented students with a strong interest to explore computational and mathematical methods related to the health sciences.
Same as: CME 520

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. Quality & Safety in U.S. Healthcare. 3 Units.
The course will provide an in-depth examination of the quality & patient safety movement in the US healthcare system, the array of quality measurement techniques and issues, and perspectives of quality and safety improvement efforts under the current policy landscape. nSame as: BIOMEDIN 254, HRP 254

SURG 256A. (CASES) Clinical Anatomy and Surgical Education Series - Torso and Limbs. 1-12 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 and the elective Operative Anatomy 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, surgical and communication skills. Through the case presentations and explanation of their surgical procedures, students will be improving their rhetorical skills to benefit the doctor-patient relationship. Course coordinators and guest speakers are clinical specialists in the areas or orthopedic surgery, abdominal surgery, thoracic surgery, neurosurgery and oral surgery. The class is limited to 12 students. nThe course is divided into two-session segments. The first session of each segment includes a short case scenario of a common medical condition presented by a guest expert, followed by student discussion. Prior to the second session, students (working as a group) will research the diagnostic, treatment and surgical options of the condition, prepare a case study using division-prepared and outside resources, and plan a surgical procedure to be performed on fresh or lightly embalmed cadaver specimens. At the second session, the group will present their case study and perform a surgical procedure to treat the condition. During the procedure, the presenting students will be required to discuss the surgical technique and associated anatomy. Class discussion will be encouraged during the presentation and surgical phases.

SURG 256B. (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, has the same prerequisites and follows the same course outline as SURG256A. The emphasis will be on the treatment of medical conditions affecting the head and neck. Course coordinators and guest speakers are clinical specialists in the areas or oral surgery, maxillofacial surgery, ophthalmic surgery, ENT surgery and neurosurgery. The class is limited to 12 students. n(SURG256A is not a prerequisite for SURG256B.).

SURG 257. Clinical Teaching Seminar Series. 1 Unit.
The Clinical Teaching Seminar Series (CTSS) is a year-long program in medical education, designed to introduce clinical educators to fundamental concepts in education. The seminars are high-yield, relevant, and interactive, providing practical tips for bedside teaching, curriculum development, and education research. nThe HONORS CERTIFICATE PROGRAM IN MEDICAL EDUCATION is meant to recognize participants with a dedication to medical education, who regularly attend the seminars and complete a scholarly project. The Honors Program is a multi-disciplinary program open to all medical students, residents, fellows, staff, and faculty with an interest in medical education.
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. Pre-requisites: Co-enrollment in INDE 290.

SURG 281A. Musculoskeletal Disorders. 1 Unit.
Focuses on in-depth understanding of human musculoskeletal anatomy, biomechanics, and disease processes. Emphasis will be on the dynamic nature of musculoskeletal tissue with its complex biochemistry and cellular activity. Topics include fundamentals of musculoskeletal development, growth, repair and vascularization. In addition, students receive an introduction to musculoskeletal imaging, forensics, pathology, and the clinical principals of fixation and treatment protocols.

SURG 281B. Musculoskeletal Disorders II. 1 Unit.
Continuation of in-depth understanding of human musculoskeletal anatomy, biomechanics, and disease processes. Emphasis will be on the dynamic nature of musculoskeletal tissue with its complex biochemistry and cellular activity. Topics include fundamentals of musculoskeletal development, growth, repair and vascularization. In addition, students receive an introduction to musculoskeletal imaging, forensics, pathology, and the clinical principals of fixation and treatment protocols.

SURG 290. 3D Biomedical Visualization: Techniques, Methods, and Applications. 1 Unit.
Explores the power of digital anatomy. How 3D anatomical data sets like CT and MRI scans are created from human specimens; how they are processed, analyzed, and rendered. Focus on how digital content is best used for learning anatomy, patient education, and clinical practice.

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 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 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 399. Graduate Research. 1-18 Unit.
Students undertake investigations sponsored by individual faculty members.

SURG 60Q. Virtual to Real: Fundamentals of Human Anatomy. 3 Units.
Advances in imaging technologies allow us to interact with anatomical information in ways that have not been previously possible. This course is designed to teach human anatomy through the interpretation of radiographs and CT scans, and the correlation of these images to real anatomy. Utilizes resources such as virtual interactive scans via the virtual anatomy table and interactive digital applications to aid students in developing their image interpretive skills. First six weeks focus on image interpretation and the remaining four weeks on the utilization of this knowledge in the understanding and identification of human anatomy on human prosecutions (cadaver material).

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 71Q. Procedural Anatomy. 3 Units.
Study of human anatomy through the understanding of eight to ten common conditions, such as diseases, injuries, and genetic defects, that affect the head and neck region and the associated surgical procedures to treat these conditions. Students are exposed to the modalities involved in confirming the diagnosis of these common conditions, the benefits and risks of the procedures to treat these conditions, and the anatomy affected by the conditions and procedures. The laboratory component exposes students to surgical procedures on cadaver material and the learning of anatomy via 3D digital images, the 3D dissection table and models. The focus is on learning clinically relevant anatomy of the hand and neck region.

SURG 72Q. Anatomy in Society. 3 Units.
Preference to sophomores. The influence of human anatomy on the design of commercial products and performance (such as headphone and earbud design, automobile interior design, table music performance and handicap devices design). How societal advancements have evolved to increasingly accommodate human form and function. Guest speakers are experts in the fields of audiology, design and music. Exposure to human anatomy via cadaver material, 3D digital images, the 3D dissection table and models.