

ANESTHESIOLOGY (ANESTHES)

ANESTHES 699 – INDEPENDENT STUDY

0-5 credits.

Independent study projects as arranged with faculty or instructional staff.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

Learning Outcomes: 1. Develop critical, analytical, and independent thinking skills

Audience: Undergraduate

ANESTHES 910 – INDEPENDENT READING & RESEARCH IN ANESTHESIOLOGY

1-4 credits.

Independent research under the direct supervision of Anesthesiology Faculty. Each student's research project is individualized to meet student research goals within the context of the faculty research needs.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

Learning Outcomes: 1. Formulate a hypothesis or specific objective if study does not involve hypothesis generating research

Audience: Graduate

2. Conduct a thorough literature review as it pertains to the specific scholarly project

Audience: Graduate

3. Select and apply, and/or understand statistical methodologies as appropriate for the proposed scholarly project

Audience: Graduate

4. Interpret results correctly and in context of previous findings from literature review

Audience: Graduate

ANESTHES 911 – THE SHOCK COURSE

2 credits.

Early recognition and aggressive management of shock states is one of the most challenging and rewarding patient care experiences. If done well the patient impact is incredible and lives can be saved. Integrate detailed physiologic understanding of shock states and shock evaluation - including echocardiography - with the pharmacology of shock management to develop a practical approach to patient care. Echocardiography training will emphasize obtaining views, recognizing anatomy and appreciating biventricular function as a method to differentiate shock states and select an appropriate treatment plan. The in-depth science of the course will be supplemented by clinical experiences focusing on shock evaluation and management in the cardiothoracic critical care unit, medical intensive care unit and, when possible, with cardiac anesthesiology enabling the student to develop a practical bedside approach to the evaluation and management of shock.

Requisites: MED SC-M 810, 811, 812, and 813

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2021

Learning Outcomes: 1. Describe the autonomic nervous system innervation and receptor function (alpha-1, alpha-2, beta-1, beta-2, dopamine (1 and 2). Describe the receptor function for the vasopressin and angiotensin systems.

Audience: Graduate

2. Describe the pharmacology of available vasoactive drugs and drips including vasoconstrictors, vasodilators and inotropes. Describe the resulting changes in hemodynamics when each drug is given.

Audience: Graduate

3. Define the term "shock".

Audience: Graduate

4. Describe the relevant goal directed, limited physical examination for a patient in "shock". Describe echo findings for varied shock states.

Audience: Graduate

5. Describe the invasive and non-invasive monitors we use to evaluate patients with shock. Understand how shock states will change the monitor results (e.g. cardiogenic shock may decrease pulse pressure on an arterial line by decreasing stroke volume; severe acute hemorrhagic shock will yield tachycardia, low stroke volume and low CVP).

Audience: Graduate

6. Describe which vasoactive to select for a given physical examination, or echocardiographic finding, and be able to describe in words or write the rationale for that medication or combination of medications.

Audience: Graduate

7. Independently obtain views for a limited point of care transthoracic echocardiogram and for pleural ultrasound

Audience: Graduate

8. Recognize anatomy on transesophageal echocardiography (TEE).

Audience: Graduate

9. Recognize basic anatomy for each view for both transthoracic echocardiogram (TTE) and TEE.

Audience: Graduate

10. Recognize shock states including hypovolemic, hyperdynamic, cor pulmonale, cardiogenic shock, obstructive shock (AS, MS, pulmonary embolism).

ANESTHES 919 – INDIVIDUALIZED ANESTHESIOLOGY CLINICAL ELECTIVE

2-4 credits.

In-depth exposure to inpatient and outpatient anesthesiology as well as sub-specialty anesthesiology, working under the direct supervision of Anesthesiology faculty, residents, fellows and advanced practice providers. Each student's schedule is individualized to meet each location's capacity and student preference.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

Learning Outcomes: 1. Perform an anesthesiologically-relevant history and physical exam

Audience: Graduate

2. Develop and present a weighted differential diagnosis for medical and surgical conditions

Audience: Graduate

3. Using clinical evidence, adapt and justify the working diagnosis

Audience: Graduate

4. Correctly interpret imaging and laboratory findings and communicate results to team members

Audience: Graduate

5. Develop and present effective anesthetic plans

Audience: Graduate

6. Review, interpret, and present current literature to support patient care

Audience: Graduate

7. Communicate effectively with patients, families, physicians and non-physician team members

Audience: Graduate

8. Communicate and collaborate with consultants and/or primary team and other providers to coordinate care

Audience: Graduate

9. Avoid medical jargon when communicating with patients and families

Audience: Graduate

10. Recognize limitations and seek assistance as appropriate

Audience: Graduate

11. Recognize perioperative conditions that determine patient level of care and interpret physiologic changes that require changing that level of care

Audience: Graduate

12. Perform minor procedures with supervision

Audience: Graduate

13. Demonstrate the ability to manage time and understand, access, and utilize the resources and systems necessary to provide optimal patient care

Audience: Graduate

ANESTHES 920 – CLINICAL ANESTHESIOLOGY ELECTIVE

2-4 credits.

Supervised by house staff, clinical anesthetists and attending physicians. Activities include: pre-operative chart review and anesthetic plan proposal, participating in scheduled procedures, presenting cases and teaching topics, and discussing patient cases. Evaluate and learn to co-manage the full spectrum of inpatient and ambulatory anesthesia patients. Care for patients undergoing sedation, monitored anesthesia care, general and regional anesthesia. Learn the indications for and data provided by various invasive and non-invasive monitoring techniques. Become familiar with relevant pharmacology including, anesthetic agents, muscle relaxants, resuscitation drugs and pain medications. Learn fundamental airway management skills including bag-mask ventilation, supraglottic airway placement, and endotracheal intubation skills. Intravenous access technique practice is taught, including a central line placement course.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

Learning Outcomes: 1. Demonstrate the initial steps of resuscitation, including IV access, central venous access, and airway management.

Audience: Graduate

2. Explain the anatomy, physiology, and pharmacology relevant to anesthetic induction, maintenance, and emergence.

Audience: Graduate

3. Perform pre-operative airway examination; identify airway anatomy and structures, including innervation and rationale for/approach to awake intubation.

Audience: Graduate

4. Identify medical conditions that affect anesthetic risk by organ system and describe the role of medical management of these conditions.

Audience: Graduate

5. Propose comprehensive anesthetic plans for surgery or procedures to resident and attending physician mentors.

Audience: Graduate

6. Demonstrate effective, respectful communication with patients, faculty, and staff to provide high-level patient care.

Audience: Graduate

7. Incorporate feedback regarding technical skill and clinical performance into improved clinical skill technique and patient care.

Audience: Graduate

8. Interpret the medical literature and apply it to the practice of evidence-based medicine.

Audience: Graduate

9. Interpret basic Transesophageal Echocardiogram, (TEE) images.

Audience: Graduate

ANESTHES 922 – CARDIOTHORACIC INTENSIVE CARE UNIT CLINICAL ANESTHESIA ELECTIVE

2-4 credits.

Participate in the care of critically ill patients assigned to the Cardiothoracic Intensive Care Unit (CITCU) critical care team. Includes post-surgical patients who have undergone coronary artery bypass grafting, cardiac valvular procedures, ventricular assist device placements, cardiac transplantation and lung transplantation. May include patients with significant cardiothoracic surgical history (e.g. patients who have a ventricular assist device or who had prior lung transplantation) who are admitted for "medical" reasons including sepsis or shock of varying etiologies. As part of the CITCU team, participate in management of patients requiring venovenous and venoatrial extracorporeal membrane oxygenator (ECMO) support. The students are supervised by residents (house staff), fellows (largely in critical care anesthesiology, occasionally in pulmonology critical care) and attending physicians.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

Learning Outcomes: 1. Define shock and list the categories of Shock
Audience: Graduate

2. Describe the clinical presentation of all forms of shock including hypovolemic under resuscitated hemorrhagic cardiogenic or valvular left ventricle and right ventricle etiologies vasoplegic and mixed shock states
Audience: Graduate

3. Describe a goal orientated physical examination for a patient in shock
Audience: Graduate

4. Diagnose a patient's shock state with the use of physical examination and advanced monitors including arterial lines pulmonary arterial catheters central venous pressure and echocardiography
Audience: Graduate

5. Develop a management plan for a patient's shock state by appropriate use avoidance of fluids pressors vasodilators and inotropes of varying combinations
Audience: Graduate

6. Describe the different valvular cardiomyopathies and describe the hemodynamic goals for these clinical states in the precorrection and post correction states
Audience: Graduate

7. Describe lung protective ventilation
Audience: Graduate

8. Describe how optimal PEEP is determined at the bedside
Audience: Graduate

9. Assess for ventilator synchrony and compliance
Audience: Graduate

10. Describe ventilator modes and breath delivery for the following: pressure regulated volume control pressure control assist control volume control assist control synchronized intermittent mechanical ventilation and pressure support
Audience: Graduate

11. Adjust ventilator settings to improve synchrony or the acid base status of a patient
Audience: Graduate

ANESTHES 930 – RESUSCITATION ANESTHESIOLOGY ELECTIVE

1 credit.

An expanded version of the American Heart Association's Advanced Cardiac Life Support (ACLS) course designed to provide the necessary knowledge and skills to manage the first minutes of a cardiorespiratory emergency using ACLS protocols. Opportunities to learn the proper management of the ten core cases (i.e. Asystole, Bradycardia, Tachycardia, etc.) in the three rescuer roles: lone rescuer; resuscitation team member; and resuscitation team leader. Learn essential resuscitation skills including: recognition of cardiac arrest rhythms and common bradycardias and tachycardias; proper use of conventional and automated external defibrillators (AED); use of transcutaneous pacing devices; advanced airway management; administration of drugs via intravenous and endotracheal routes; recognition of the 12-lead electrocardiogram signs of acute injury and ischemia; adult CPR.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2022

Learning Outcomes: 1. Manage a code with confidence
Audience: Graduate

2. Describe the physiology of cardiac arrest
Audience: Graduate

3. Ability to perform advanced CPR
Audience: Graduate

4. Practice team leader skills and utilize them not only in a code, but in other high acuity settings
Audience: Graduate

5. Successfully complete the AHA ACLS course
Audience: Graduate

6. Define systems of care
Audience: Graduate

ANESTHES 940 – INTEGRATED ELECTIVE IN PAIN MANAGEMENT

2 credits.

Direct supervision by residents, fellows, and attending physicians in Anesthesiology, Neurology, and Palliative Care departments, including but not limited to the Acute Pain Service, Regional Anesthesia service, Chronic Pain Service, Chronic Pain Clinic, Headache Clinic, Carbone Cancer Center, and Madison Surgery Center. Participate in regularly scheduled supervisor-student meetings, which involve some or all of the following: rounding on service patients, interviewing clinic patients, participating in scheduled procedures, presenting cases and teaching topics, and discussing patient cases. Complete independent activities including some or all of the following: reading about patient conditions and preparing for direct patient care as needed. Complete other patient care related learning activities as assigned by instructors; these are dependent on the individual student, the patients under the student's care, and the location.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

Learning Outcomes: 1. Distinguish between acute pain as a symptom indicating actual or potential tissue damage, and while chronic pain, that has no physiological function.

Audience: Graduate

2. Describe the pathophysiological effects of poorly controlled acute pain.

Audience: Graduate

3. Discuss the epidemiology and risk factors for developing chronic pain.

Audience: Graduate

4. Demonstrate ability to assess pain and its impact on function, mood and QOL including in adults and children.

Audience: Graduate

5. Describe differences in treatment approaches for acute and chronic pain.

Audience: Graduate

6. Discuss causes, clinical presentation and treatment of common chronic pain disorders, e.g. low back pain, fibromyalgia, osteoarthritis, CRPS, headaches, and neuropathy.

Audience: Graduate

7. Describe the prevalence of pain in cancer and palliative care settings, mechanisms of pain, evaluation and treatment approaches.

Audience: Graduate

8. Describe evidence for use of different drugs, including opiod analgesics in acute and chronic pain treatments

Audience: Graduate

9. Describe evidence for use of non-pharmacological approaches (rehabilitation treatments and behavior psychology) in acute and chronic pain treatments

Audience: Graduate

10. Describe evidence for interventional approaches (regional anesthetic blocks, spinal injections, nerve and joint injections) in pain management.

Audience: Graduate