

## **MHSA Course Descriptions**

### **ANE 5004 Pharmacology**

The course introduces students to the study of pharmacology with clinical applications. Emphasis has been placed on the integration of clinical therapeutics of various anesthesia medications as well as basic principles and pharmacologic properties of clinically relevant medications. The course content provides an opportunity for students to deepen their understanding of the clinical use of medications. This course introduces basic principles of pharmacology and focuses on those drugs most often used in the practice of anesthesia, including inhaled anesthetics, opioids, barbiturates, benzodiazepines, anticholinesterases and anticholinergics, neuromuscular blockers, and adrenergic agonists and antagonists. The course provides an overview of drug actions, interactions, metabolism, methods of administration, dosages, side effects, precautions, and contraindications. This course focuses on the pharmacokinetics and pharmacodynamics of major drug classifications. Their interactions with anesthetic agents are discussed. Basic principles of drug action; absorption, distribution, metabolism, and excretion of drugs; mechanisms of drug action; toxicity. The basis for the use of medicines in pharmacologic therapy of specific diseases.

### **ANE 5014 Physiology**

Human physiology seeks to understand the mechanisms that work to keep the human body alive and functioning through scientific enquiry into the nature of mechanical, physical and biochemical functions of humans, their organs and the cell of which they are composed. The principal level of focus of physiology is at the level of organs and systems within systems. As a detailed study of the functioning, integration and interrelationships of organ systems This course is designed to provide the student with the essential and fundamental concepts in medical physiology for a career in healthcare. This information will be categorized into fourteen sections within one block, covering Cell & Muscle Physiology, Autonomic & Endocrine Regulation of Body Systems, Cardiovascular Physiology, Pulmonary, Gastrointestinal, Renal, and Maternal-Fetal Physiology.

### **ANE 5044 Basic Technical Skills & Patient Assessment**

This is an anesthesia laboratory in which we will begin our basic anesthesia concepts and skills. This course will incorporate all anesthesia classroom knowledge into the clinical setting and provide hands-on training to develop our anesthesia skills. The knowledge base for this class includes the information learned in Intro to Clinical Anesthesia, Airway Management, Medical Terminology, Anatomy, and Physiology. Skills learned in this class will be necessary for your introduction into your clinical anesthesia rotations, where you will be performing all skills learned in this semester's lab. The skills learned are: (1) airway management, including endotracheal

intubation and laryngeal mask airway insertion; (2) anesthesia machine checkout; (3) patient monitoring; (4) intravenous insertion and management; and (5) patient positioning. This course provides students with the tools to conduct a comprehensive medical interview. Students will learn effective methods for obtaining and documenting historical information, developing communication skills with patients and healthcare providers, and providing patient counseling through lectures, case discussions, simulations, and standardized patients. This course also provides students with the skills to perform a complete physical examination, which is essential to patient evaluation and anesthetic management. Students will learn critical thinking skills, physical examination techniques, and the interpretation and documentation of medical findings through participation in laboratory sessions, patient simulations, and small-group discussions. Basic Life Support (BLS), Advanced Life Support (ACLS), and Pediatric Advanced Life Support (PALS) certification is required for course completion.

### **ANE 5054 Technology & Monitoring in Anesthesia**

Students are taught the proper balance between circuits and engineering concepts and the clinical application of anesthesia instrumentation. Monitors and devices used in the operating room are studied with respect to principles of operation, calibration, and interpretation of data. Principles, application, and interpretation of various monitoring modalities including ECG, invasive and non-invasive blood pressure, oximetry, cardiac output, respiratory gas analysis, and respiration. Also includes intraoperative neurophysiology monitoring, temperature, coagulation/hemostasis, neuromuscular junction, transesophageal echocardiography, and ICP. The course covers advanced concepts of arterial pressure monitoring, ICP monitoring, transesophageal echocardiography, and the hazards and complications of monitoring patients during anesthesia.

### **ANE 5061 Cardiac Electrophysiology**

Acquiring a deeper understanding of the cardiovascular system and how it functions, students will practice basic electrocardiograph patient care techniques, applying legal and ethical responsibilities. Students learn the use of medical instrumentation, electrocardiogram theory, identification of and response to mechanical problems, recognition of cardiac rhythm and response to emergency findings. This course is designed to fill the needs of students who desire the ability to interpret the resting normal and abnormal ECG, as well as provide an overview of heart anatomy, function and neurophysiology. Coursework includes basic and advanced ECG interpretation using simulators to understand an overview of heart anatomy, function, and electrophysiology. Diagnosis and practical applications of electrocardiography and echocardiography as monitoring techniques in the operating room will be emphasized.

### **ANE 5081 Themes in Anesthesia I**

Themes in Anesthesia I is the first of three Theme weeks during the Foundation Phase of the curriculum. This course integrates thematic content with an emphasis on core concepts needed for professional clinical practice in the changing healthcare environment. Students will explore areas related to humanism in medicine including the themes of diversity, equity and inclusion, determinants of health, advocacy for the profession and sub-specialties of anesthesiology. Theme I focuses on various aspects of professionalism including advocacy for the Anesthesiologist Assistant profession and the Anesthesia Care Team, wellness, and servant leadership. This course exposes students to the societal, regulatory, ethical, and professional aspects of coming an Anesthesiologist Assistant. Students will learn the history of the AA profession and address specific topics including professional mobility, governmental funding, healthcare system structure, employment, credentialing, intra-professional communication, leadership, and resources for lifelong learning all through the lens of servant leadership. The week-long intensive also explores aspects of wellness of mind, body, and spirit with a focus on work-life balance.

### **ANE 5901 Comprehensive Competency Examinations I & II**

In its entirety, this course will provide a complete review of current anesthesia practice. The Comprehensive Competency Examinations (CCE) are administered at ten (10) intervals throughout the Anesthesiologist Assistant Program. These examinations serve to ensure continued development of the core fundamentals of anesthetic knowledge, retention of previously introduced concepts and assimilation of the didactic curriculum into clinical practice. The student will be expected to demonstrate depth and breadth of knowledge of the practice of anesthesia. The examination will also serve as a guide to relevant study material for the student prior to sitting for his or her national certification examination administered by the National Commission on the Certification of Anesthesiologist Assistants (NCCAA).

### **ANE 5024 Clinical Anatomy**

This course teaches students the structures within the human body; to include surface anatomy and diagnostic imaging, through regional study of prosected systems of the body. Utilizing lectures, discussion, models and prosected cadavers, students will have a structural introduction to the organ systems of the thorax, head and neck, abdomen, and pelvic vault. Upon completion of the course, students will be able to identify normal anatomical structures, recognize abnormal anatomy, and determine the clinical implications of pathologic anatomy.

### **ANE 5911 Comprehensive Competency Examinations III**

In its entirety, this course will provide a complete review of current anesthesia practice. The Comprehensive Competency Examinations (CCE) are administered at ten (10) intervals throughout the Anesthesiologist Assistant Program. These examinations serve to ensure continued development of the core fundamentals of anesthetic knowledge, retention of previously introduced concepts and assimilation of the didactic curriculum into clinical practice. The student will be expected to demonstrate depth and breadth of knowledge of the practice of anesthesia. The examination will also serve as a guide to relevant study material for the student prior to sitting for his or her national certification examination administered by the National Commission on the Certification of Anesthesiologist Assistants (NCCAA).

### **ANE 5807 Foundations of Clinical Anesthesia**

This course is a hybrid course, integrating three months of immersive experience in clinical anesthesia (Clinical Practicum) and classroom and simulation exercises to educate the student to work within the anesthesia care team (ACT) as an anesthesiologist assistant (AA). The coursework (Boot Camp) focuses on an introduction to experiences in the operating room with emphasis on the fundamental procedures and techniques used in administering an anesthetic. Prepares and educates the student to work within the anesthesia care team. This course provides master's level anesthesia students with an in-depth exploration of essential topics in clinical anesthesia. Covering a wide range of subjects from drug review and perioperative flow to patient handoff and clinical evaluation, the course is designed to enhance both knowledge and practical skills. Students will engage with expert-led lectures, hands-on workshops, and detailed discussions to develop comprehensive anesthesia care plans, understand the dynamics of the perioperative team, and master patient safety and quality assurance. The course also emphasizes the importance of effective communication, emotional intelligence, and patient-centered care in anesthesia practice.

### **ANE 5151 Themes II: Health Equity & Access to Care**

Themes in Anesthesia II is a continuation in the series during the Foundation Phase of the curriculum, followed by a 'threaded' theme course throughout the Integrative Phase. This course integrates thematic content with an emphasis on core concepts needed for professional clinical practice in the changing healthcare environment. Students will explore areas related to humanism in medicine including the themes of healthcare equity, determinants of health, advocacy for the profession, and subspecialties of anesthesiology. Healthcare professionals have a growing responsibility to improve access to care and equity in healthcare delivery efforts not only for their employees, but also to better serve patients and their families. Healthcare access has been a recent focus for many businesses and organizations across the world. But the healthcare industry has a particularly unique opportunity to make a greater impact, as it directly affects a broad set of patient health outcomes and quality of life in a profound way.

### **ANE 5103 Pathophysiology in Anesthesia**

Pathophysiology is defined as the physiology of altered health. Pathophysiology deals with the study of structural and functional changes in cells, tissues, and organs of the body that cause or are caused by disease. Pathophysiology also focuses on the mechanisms of the underlying disease process and provides the background for preventative as well as therapeutic health care measures and practices. In this course, students will have the opportunity to apply their knowledge of normal physiology while analyzing the consequences of pathophysiological processes and applying this analysis to basic diagnostic and treatment principles. Students will also be evaluating and analyzing current medical advances using the scientific process. This course focuses on the pathophysiology of the human cardiovascular, respiratory, and renal systems, and on how these systems are altered by various physiologic challenges. The concept of homeostasis is integrated with general disease processes such as injury, inflammation, fibrosis, and neoplasia to demonstrate ways in which perturbations in physiological regulatory mechanisms and anatomy result in pathophysiology. We particularly focus on the effects of stress and obesity on these systems, and on differences between men and women in the manifestation of diseases of these systems.

### **ANE 5113 Applied Physiology and Pharmacology for Anesthesia**

Anesthesia practice depends on the basic sciences of physiology and pharmacology, and this course summarizes the main aspects of physiology and pharmacology to anesthesiology. While anesthesia is intended to block or diminish the physiologic responses to painful stimuli, as well as the perception of pain, the neurologic effects are not the only important consideration. Circulatory and respiratory effects of anesthesia and perioperative events are also vital concerns. Additionally, interactions with the patient's pathophysiology can crucially affect the anesthetic course. This course offers basic and applied human systems physiology with emphasis on topics and areas of special concern to the anesthetist. This course has been developed to instruct anesthesiologist assistant students in the application of pharmacology with a focus on the clinical relevance of human physiology that pertains to patients in the perioperative period.

### **ANE 5123 Anesthesia & Co-Existing Diseases**

The course offers a concise, thorough coverage of pathophysiology of the most common diseases and the anesthetic management of these diseases. The primary aim of the course is to provide guidance needed to successfully manage or avoid complications stemming from pre-existing conditions with detailed discussions of each disease, the latest practice guidelines, and easy-to-follow treatment algorithms. The course will also present detailed discussions of common diseases, highlights of more rare diseases and any unique features that could be of importance in the perioperative period, as well as specific anesthesia considerations for special patient populations, including pediatric, obstetric, medically-underserved, and geriatric patients.

### **ANE 5133 Anesthesia Principles & Practices**

This course offers a deep dive into specific surgical and procedural specialties to understand the implications of a derivative anesthetic plan. The course serves as the culmination of medical knowledge learned to this point and ties together knowledge and application domains for anesthetic plan development. Principles involved in the formulation of anesthetic plans based upon data obtained during the preoperative evaluation will be discussed, including the formulation and practices of different anesthetic plans and techniques as related to specific surgical procedures and pathophysiology. Advanced principles of anesthesia equipment, monitoring, documentation, patient assessment, basic patient care, and infection control are examined with detailed studies of anesthetic techniques for different surgical procedures and for patients with acute and chronic diseases. Concepts of perioperative and psycho-social assessment, care plans, and anesthesia techniques are explored in detail.

### **ANE 5144 Advanced Technical Skills & Non- Technical Skills**

A hybrid course experience in the standardized patient laboratory and anesthesia simulator will prepare the student for the usage and complete understanding of the monitors and practice of anesthesia. Students will apply their didactic knowledge to scenarios on the anesthesia simulator. Patient modalities are explored, such as pulse oximetry, capnography, and blood pressure monitoring systems. Laboratory experiments will develop the students understanding of anesthesia delivery systems, various types of breathing circuits, fresh gas flow effect, theory of dilutional methods of cardiac output monitoring, relations between mean circulatory filling pressures and central venous pressure. Additionally, the course expands upon the student skill set of tools to perform a comprehensive health assessment on clients across the lifespan. Builds knowledge of anatomy, physiology, pathophysiology, and health assessment skills previously attained in the curriculum. The diagnostic reasoning skills needed for clinical reasoning in the advanced practice role is emphasized. The ANTS system supplies students with a language for discussing the ‘behavioral aspects’ of performance. It can be used for assessing an individual’s behavior, to provide input for the training process, and for structuring feedback on skills development. Instructors utilize simulator technique to teach advanced principles of anesthesia, including case management, effective communication while under stress, diagnosis, and treatment of acute physiologic abnormalities, including support for and review of training in BLS and ACLS. A review of critical crisis management and rescue techniques, which are not often seen in practice.

### **ANE 5161 Human Factors and Decision Making**

Healthcare, particularly in acute care settings like anesthesiology, is a high-stakes, high-stress environment where human performance plays a central role in patient outcomes. This intensive, two-day workshop-style course equips students with a foundational understanding of human factors science and crisis resource management (CRM) in the context of anesthesia practice. Through a mix of interactive lectures, simulations, hands-on tasks, student-led discussions, and reflective assignments, learners will explore how perception, cognition, communication, stress, fatigue, and team dynamics impact decision-making under pressure.

Topics include mental workload, situational awareness, human error, stress and fatigue, leadership and followership, team communication, root cause analysis, and threat and error management. Real-world case studies, task saturation exercises, and structured group debriefings will help students develop practical strategies for anticipating and mitigating risk. The course also draws on lessons from aviation, the military, and historical disasters to build a deeper understanding of safety culture and the role of non-technical skills in anesthesia. Students will leave this course better prepared to perform in high-risk, rapidly evolving clinical environments with both technical competence and cognitive resilience.

### **ANE 5211 Themes in Anesthesia III**

This course is an intensive, three-day immersive workshop designed to help future anesthesia providers understand and apply the principles of customer service, emotional safety, and patient-centered communication in the perioperative setting. Rather than approaching patient experience as an abstract concept, this course focuses on what patients feel, what they fear, and how small provider behaviors profoundly shape trust and satisfaction. Using evidence from high-reliability industries and world-class service organizations, students will explore how excellence in patient care mirrors excellence in hospitality, communication, and leadership. Drawing on world-class service exemplars, students will learn how emotional intelligence, communication, environmental design, and micro-behaviors shape the patient's journey through perioperative care, translating these core principles directly into concrete clinical behaviors for anesthesia practice. Across multiple learning sessions, students will study how "little but impactful" actions dramatically influence patient trust, comfort, anxiety, and overall experience. Through modeling, role-play, case studies, scenario labs, and structured reflection, students will translate these lessons into concrete clinical behaviors that are immediately applicable in pre-op, induction, intraoperative culture, and PACU care.

### **ANE 5921 Comprehensive Competency Examinations IV & V**

In its entirety, this course will provide a complete review of current anesthesia practice. The Comprehensive Competency Examinations (CCE) are administered at ten (10) intervals throughout the Anesthesiologist Assistant Program. These examinations serve to ensure continued development of the core fundamentals of anesthetic knowledge, retention of previously introduced concepts and assimilation of the didactic curriculum into clinical practice. The student will be expected to demonstrate depth and breadth of knowledge of the practice of anesthesia. The examination will also serve as a guide to relevant study material for the student prior to sitting for his or her national certification examination administered by the National Commission on the Certification of Anesthesiologist Assistants (NCCAA).

### **ANE 5931 Comprehensive Competency Examinations VI & VII**

In its entirety, this course will provide a complete review of current anesthesia practice. The Comprehensive Competency Examinations (CCE) are administered at ten (10) intervals throughout the Anesthesiologist Assistant Program. These examinations serve to ensure continued development of the core fundamentals of anesthetic knowledge, retention of previously introduced concepts and assimilation of the didactic curriculum into clinical practice. The student will be expected to demonstrate depth and breadth of knowledge of the practice of anesthesia. The examination will also serve as a guide to relevant study material for the student prior to sitting for his or her national certification examination administered by the National Commission on the Certification of Anesthesiologist Assistants (NCCAA).

### **ANE 5817 Clinical Practicum II**

Both clinical and non-clinical learning activities during the Integrative Year are based upon a philosophy of increasingly self-directed learning. The didactic lectures are presented in a seminar format directed toward critical review of literature on selected topics. The Block clinical exposure is primarily spent in general anesthesia rotations, but advanced student standing may allow some exposure to specialty areas of care. At the discretion of the Medical Directors, all students in good standing are given the opportunity to undertake satellite elective months. During the entire Integrative Phase, students are permitted to complete up to three (3) elective satellite rotations. Additionally, students may voluntarily utilize their vacation time between the fall and winter semesters for additional satellite rotations.

### **ANE 5941 Comprehensive Competency Examinations VIII**

In its entirety, this course will provide a complete review of current anesthesia practice. The Comprehensive Competency Examinations (CCE) are administered at ten (10) intervals throughout the Anesthesiologist Assistant Program. These examinations serve to ensure continued development of the core fundamentals of anesthetic knowledge, retention of previously introduced concepts and assimilation of the didactic curriculum into clinical practice. The student will be expected to demonstrate depth and breadth of knowledge of the practice of anesthesia. The

examination will also serve as a guide to relevant study material for the student prior to sitting for his or her national certification examination administered by the National Commission on the Certification of Anesthesiologist Assistants (NCCAA).

### **ANE 5817 Clinical Practicum III**

Both clinical and non-clinical learning activities during the Integrative Year are based upon a philosophy of increasingly self-directed learning. The didactic lectures are presented in a seminar format directed toward critical review of literature on selected topics. The Block clinical exposure is primarily spent in general anesthesia rotations, but advanced student standing may allow some exposure to specialty areas of care. At the discretion of the Medical Directors, all students in good standing are given the opportunity to undertake satellite elective months. During the entire Integrative Phase, students are permitted to complete up to three (3) elective satellite rotations. Additionally, students may voluntarily utilize their vacation time between the fall and winter semesters for additional satellite rotations.

### **ANE 5332 Health Care Quality Improvement**

In this course, students will acquire knowledge of practice transformation in specific ways to improve health care. Upon successful completion of the course, students will be eligible for the Certification by the Institute for Healthcare Improvement. The course modules address patient safety, health care leadership, the Triple Aim, patient safety, quality improvement, and patient focused care. The first half of the course introduces patient safety, discusses the relationship between error and harm, explores how human factors impact safety, stresses the importance of teamwork and communications in delivering safe care, and explains how to respond to adverse events. The latter course content focuses on the challenges to continuous quality improvement, the model for improvement, approaches to implementing change, how to test and measure changes in the PDSA cycle, interpret quality improvement data, and lead quality improvement initiatives. The course also touches on patient centered care and includes addressing implicit bias, the components of empathy, and effective communications, the Triple Aim for populations, what contributes to population health, and the importance of providing a high-value health care system. Students will be prepared to exhibit leadership in quality improvement, describe the characteristics of effective leadership, and practice different approaches to implement changes.

### **ANE 5912 Research Methods**

The course will provide an overview of the important concepts of research design, data collection, statistical and interpretative analysis. The focus of the course is not on mastery of statistics but on the ability to use research in the clinical anesthesia environment. The course uses systematic inquiry and analysis while reinforcing the problem-solving method and uses research in the

improvement of healthcare practice to affect positive outcomes. The course focuses on the fundamentals of the research process, namely research ethics, qualitative research methods and non-experimental methods. Students are taught how to use statistics to answer questions and how to use this skill to aid in the review and interpretation of healthcare literature and research.

### **ANE 5853 Capstone Project**

In this course students apply and deepen the QI knowledge and skills learned in Healthcare Quality Improvement through a research, quality improvement, or education project, considered within an inter-professional, systems-based perspective. With guidance from a faculty advisor, each student completes an approved master's paper on a topic relevant to healthcare delivery, quality improvement, or coordinated perioperative care, requiring an in-depth review of the primary literature and demonstrating the ability to critically analyze and integrate current research. In addition to the paper, students produce a final deliverable appropriate to their project, which may include a presentation, workshop, resource, or other applied product. The Project is a culminating activity that provides a way for students to demonstrate the knowledge and skills they acquired throughout the Program. It engages students in a project/experience that focuses on an interest relative to quality improvement, that synthesizes didactic study and real-world perspective.

### **ANE 5951 Competency Examinations IX**

In its entirety, this course will provide a complete review of current anesthesia practice. The Comprehensive Competency Examinations (CCE) are administered at ten (10) intervals throughout the Anesthesiologist Assistant Program. These examinations serve to ensure continued development of the core fundamentals of anesthetic knowledge, retention of previously introduced concepts and assimilation of the didactic curriculum into clinical practice. The student will be expected to demonstrate depth and breadth of knowledge of the practice of anesthesia. The examination will also serve as a guide to relevant study material for the student prior to sitting for his or her national certification examination administered by the National Commission on the Certification of Anesthesiologist Assistants (NCCAA).

### **ANE 5856 Clinical Practicum III**

Both clinical and non-clinical learning activities during the Integrative Year are based upon a philosophy of increasingly self-directed learning. The didactic lectures are presented in a seminar format directed toward critical review of literature on selected topics. The Block clinical exposure is primarily spent in subspecialty anesthesia rotations, including pediatrics, cardiothoracic, neurosurgery, obstetrics, critical care and Perioperative Surgical Home. At the discretion of the Medical Directors, all students in good standing are given the opportunity to undertake satellite elective months. During the entire Integrative Phase, students are permitted to complete up to three

(3) elective satellite rotations. Additionally, students may voluntarily utilize their vacation time between the fall and winter semesters for additional satellite rotations.

### **ANE 5866 Clinical Practicum V**

Both clinical and non-clinical learning activities during the Integrative Year are based upon a philosophy of increasingly self-directed learning. The didactic lectures are presented in a seminar format directed toward critical review of literature on selected topics. The Block clinical exposure is primarily spent in subspecialty anesthesia rotations, including pediatrics, cardiothoracic, neurosurgery, obstetrics, critical care and Perioperative Surgical Home. At the discretion of the Medical Directors, all students in good standing are given the opportunity to undertake satellite elective months. During the entire Integrative Phase, students are permitted to complete up to three (3) elective satellite rotations. Additionally, students may voluntarily utilize their vacation time between the fall and winter semesters for additional satellite rotations.

### **ANE 5961 Certification Exam Preparation: Comprehensive Competency Examination X**

In its entirety, the course will provide a review of current anesthesia practice framed against the primary topic areas of the certification exam delivered by the National Commission for Certification of Anesthesiologist Assistants (NCCAA). Students will review issues and topics germane to the professional practice of the AA, including the principles of anesthesia, pathophysiology, technology and monitoring, pharmacology, and subspecialty areas of anesthesiology. The course builds off the progressive curriculum-wide comprehensive examinations and provides a culminating review of material likely to be addressed on the national certifying exam.

### **ANE 5221: Professional, Ethical, & Legal Concepts in Anesthesia**

The course begins with a discussion on the basic principles of medical ethics and expands to include major principles and themes in clinical ethics. Topics covered include legal aspects of the doctor-patient relationship, informed consent and competence, privacy issues, end-of-life issues, organ donation, pediatric bioethics, responsible prescribing, and human genetics. Particular attention is paid to health disparities and the difficulties related to the development of normative ethical arguments in a multicultural context and the role a physician plays as a patient advocate. The course concludes by bringing attention to the ethical dilemmas faced when encountering the hidden values in the clinical setting.