MASTER OF SCIENCE IN ANESTHESIA PROGRAM

Program Overview

Joseph M. Rifici, CAA, MEd
Executive Program Director

Jennifer Puin, PhD
Admissions Director

info@anesthesiaprogram.com or 216.844.8077
https://case.edu/medicine/msa-program/

The Department of Anesthesiology and Perioperative Medicine of University Hospitals Cleveland Medical Center includes more than fifty attending anesthesiologists on staff supervising resident anesthesiologists and anesthetists to provide the best patient care.

The Master of Science in Anesthesia (MSA) Program at Case Western Reserve University began in 1970, and originally awarded a baccalaureate degree, evolving in 1987 into a professional postgraduate curriculum and granting the Master of Science degree. Beginning in 2016, the MSA Program began awarding students the Master of Science in Anesthesia degree. Admission to the MSA Program requires a bachelor's degree with prescribed prerequisites typical of premedical coursework and successful completion of the MCAT. The application deadline for admission into the program is in October each year, with coursework beginning at the end of May. The 24-month MSA Program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) and is based on the Standards for Anesthesiologist Assistant Programs. Graduates must sit for the Certification Examination administered by the National Commission for Certification in Anesthesiologist Assistants.

The mission of the Master of Science in Anesthesia (MSA) Program at Case Western Reserve University, led by Joseph M. Rifici, CAA, MEd and Matthew P. Norcia, MD. More information can be obtained from Jennifer Puin, Admissions Director.

CWRU also oversees the Master of Science in Anesthesia Program’s Houston, Texas campus (http://case.edu/medicine/msa-program/locations/houston-tx) and Washington, DC campus (http://case.edu/medicine/msa-program/locations/washington-dc).

The program is led by Joseph M. Rifici, CAA, MEd and Matthew P. Norcia, MD. More information can be obtained from Jennifer Puin, Admissions Director.

Academic Requirements for Admission

The mission of the Master of Science in Anesthesia (MSA) Program is to graduate skilled and compassionate anesthesiologist assistants. The admission policy reflects this goal. Applicants are considered on a variety of parameters that measure academic ability, communication skills, clinical aptitude, and personality traits.

Admission to the MSA Program requires that the following criteria are met:

A. Bachelor’s degree from an accredited college or university

Documentation of each of the prerequisites having been completed with a grade of B- or higher at an accredited American or Canadian institution of higher learning is required. Prerequisites must be taken within five years prior to the application deadline. For those courses that have been repeated, the highest grade will be used in the calculation. Prerequisites include:

- one semester of biochemistry
- one year of biology with laboratory*
- one semester of human anatomy with laboratory
- one semester of human physiology
- one year of chemistry with laboratory*
- one year of organic chemistry with laboratory*
- one year of physics with laboratory*
- one semester of calculus*
- one semester of advanced statistics (preferably for the life sciences)*
- one semester of English with expository writing*

All academic requirements must be completed satisfactorily before matriculation.

* Courses marked with an asterisk that were completed with a grade of B- or higher in excess of five years prior to the application deadline will meet the prerequisite criteria only if the MCAT composite score is 500 or higher.

B. Medical College Admission Test (MCAT)

- minimum composite score of 493
- completed within three years of application deadline
- when the MCAT has been taken more than once, component scores from different exams may not be combined

Applicants with international undergraduate, graduate or advanced degrees must meet the standard admission requirements listed above. International application requirements also include the Test of English as a Foreign Language (TOEFL), the International English Language Testing System (IELTS), or the Pearson Test of English (PTE-Academic). An Education Credential Evaluation and Authentication Report for foreign transcripts is required.

All materials must be received by the deadline. Candidates participate in interviews with members of the Admissions Committee, which is comprised of faculty and staff members of the MSA Program. Prospective candidates are permitted and encouraged to shadow an anesthetist in the OR. Prior approval for this visitation is required.

The 24-month program includes 70 credit hours (six semesters) of classroom and clinical instruction. The first three semesters integrate basic science and clinical instruction. During the remaining three semesters, students complete month-long rotations in all subspecialties of anesthesiology: ambulatory surgery, burns and trauma, cardiothoracic surgery, general surgery, neurosurgery, obstetrics, pediatrics, surgical intensive care unit. Clinical training focuses on all types of anesthesia including general, epidural, spinal and peripheral nerve blockade.

Instruction is also provided in advanced patient care monitoring techniques and pre-testing, calibration and operation of anesthesia delivery systems and monitors. At CWRU, our personal approach and rigorous educational standards produce compassionate and highly skilled anesthesiologist assistants.

The MSA Program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) and is based on the Standards for Anesthesiologist Assistant Programs. Graduates sit for the Certification Examination administered by the National Commission for...
Certification of Anesthesiologist Assistants (NCCAA) and co-sponsored by the National Board of Medical Examiners (NBME).

Additional information may be found on the Master of Science in Anesthesia Program website (http://case.edu/medicine/msa-program).

### Plan of Study

#### Basic Science Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac Electrophysiology (ANES 403)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Physiology for Anesthesiologist Assistants I (ANES 456)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Correlation I (ANES 462)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Experience I (ANES 463)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacology for Anesthesiologist Assistants I (ANES 475)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Decision Making in Anesthesia (ANES 477)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamentals of Anesthetic Sciences I (ANES 480)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiological Model-Based Simulation I (ANES 486)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Non-Technical Skills Lab (ANES 488)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Clinical Experience Required</td>
<td></td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Monitoring and Instrumentation II (ANES 441)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Physiology for Anesthesiologist Assistants II (ANES 458)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Correlation II (ANES 464)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Experience II (ANES 465)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacology for Anesthesiologist Assistants II (ANES 476)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Decision Making in Anesthesia II (ANES 478)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamentals of Anesthetic Sciences II (ANES 481)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiological Model-Based Simulation II (ANES 487)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Clinical Experience Required</td>
<td></td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Monitoring and Instrumentation I (ANES 440)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Anesthesia (ANES 460)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orientation to Clinical Experience (ANES 461)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Physiological Model-Based Simulation (ANES 485)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Clinical Experience Required</td>
<td></td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year Total:</td>
<td>17</td>
<td>17</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

#### Clinical Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesia Clinical Correlation III (ANES 468)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Experience IV (ANES 469)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamentals of Anesthetic Sciences III (ANES 580)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiological Model-Based Simulation III (ANES 584)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Clinical Experience Required</td>
<td></td>
<td>511</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Correlation IV (ANES 470)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Experience V (ANES 471)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamentals of Anesthetic Sciences IV (ANES 581)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiological Model-Based Simulation IV (ANES 585)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Clinical Experience Required</td>
<td></td>
<td>516</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesia Clinical Experience III (ANES 467)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethics, Law and Diversity for Anesthesiologist Assistants (ANES 490)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Clinical Experience Required</td>
<td></td>
<td>413</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year Total:</td>
<td>11</td>
<td>11</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Total Units in Sequence: 70

Total Clinical Hours Required (Basic Science Year): 560

Total Clinical Hours Required (Clinical Year): 1440

Total Units: 2000

### Courses

**ANES 403. Cardiac Electrophysiology. 2 Units.**
In this course students will learn basic and advanced Electrocardiogram interpretation using simulators and electrocardiograms to understand an overview of heart anatomy, function, and neurophysiology.

**ANES 440. Patient Monitoring and Instrumentation I. 2 Units.**
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. A hands-on laboratory is utilized to maximize direct contact to the instrumentation of the profession.

**ANES 441. Patient Monitoring and Instrumentation II. 2 Units.**
Continuation of ANES 440. Recommended preparation: ANES 440.

**ANES 456. Applied Physiology for Anesthesiologist Assistants I. 3 Units.**
Basic and applied human systems physiology with emphasis on topics and areas of special concern to the anesthetist.
ANES 458. Applied Physiology for Anesthesiologist Assistants II. 3 Units.
Continuation of ANES 456. Recommended preparation: ANES 403 and
ANES 456.

ANES 460. Introduction to Anesthesia. 2 Units.
Introduction to basic concepts dealing with clinical anesthesia. Medical
terminology, human anatomy, medical chart interpretation and drug
dosage calculations.

ANES 461. Orientation to Clinical Experience. 3 Units.
Introduction to experience in the operating room with emphasis on
the fundamental procedures and techniques used in administering an
anesthetic. Preoperative assessment, IV placement techniques, airway
management, intraoperative patient care and postoperative management
are all emphasized in this course. BLS (basic life support) certification is
required for course completion. Recommended preparation: Acceptance
in the M.S.A. program.

ANES 462. Anesthesia Clinical Correlation I. 1 Unit.
A series of conferences presented by students that applies to anesthetic
theory as it relates to the clinical experience. Specific anesthetic
situations are emphasized. Recommended preparation: ANES 460.

ANES 463. Anesthesia Clinical Experience I. 3 Units.
A continuation of the preparation, observation, and hands-on learning
format initiated in ANES 461. Patient management and technical
skills are refined with close attention to the didactic course work. A
comprehensive clinical examination is administered at the end of the
semester. ACLS (Advanced Cardiac Life Support) certification is required
for course completion. Recommended preparation: ANES 461.

ANES 464. Anesthesia Clinical Correlation II. 1 Unit.
A spectrum of case presentation conferences presented by the students
dealing with basic and major problems in anesthesia management.
Medical and surgical history of individual patients and the outcomes
of anesthesia and surgery are emphasized. Journal Club and Morbidity
and Mortality conferences are included. Recommended preparation:
ANES 462.

ANES 465. Anesthesia Clinical Experience II. 4 Units.
A continuation of ANES 463. A comprehensive clinical examination is
administered at the end of the semester. PALS (Pediatric Advanced
Life Support) and ACLS (Advanced Cardiac Life Support) certification is
required for course completion. Recommended preparation: ANES 463,
BLS Certification, ACLS Certification.

ANES 467. Anesthesia Clinical Experience III. 4 Units.
Extended exposure to all of the clinical subspecialties of anesthesiology
(obstetrics, pediatrics, neurosurgery, cardiovascular, etc.). Students
alternate through rotations at several area hospitals. Recommended
preparation: ANES 465, ACLS certification and PALS.

ANES 468. Anesthesia Clinical Correlation III. 1 Unit.
The second-year equivalent of ANES 462. Recommended preparation:
ANES 464.

ANES 469. Anesthesia Clinical Experience IV. 8 Units.
A continuation of ANES 467. A comprehensive clinical examination is
administered at the end of the semester. Recommended preparation:
ANES 467.

ANES 470. Anesthesia Clinical Correlation IV. 1 Unit.
The second-year equivalent of ANES 464. Recommended preparation:
ANES 468.

ANES 471. Anesthesia Clinical Experience V. 8 Units.
A continuation of ANES 469. A comprehensive clinical examination is
administered at the end of the semester. Recommended preparation:
ANES 469.

ANES 475. Pharmacology for Anesthesiologist Assistants I. 3 Units.
Pharmacodynamics, pharmacokinetics, uptake, distribution and action
of the volatile and intravenous anesthetics, muscle relaxants, narcotics,
hypnotics and other pharmaceuticals used in the administration of an
anesthetic. Prereq: Consent of Department.

ANES 476. Pharmacology for Anesthesiologist Assistants II. 3 Units.
Continuation of ANES 475. Prereq: ANES 475.

ANES 477. Clinical Decision Making in Anesthesia. 2 Units.
An introduction to thinking about clinical situations and problems and
coming to safe and effective solutions to these problems. This course
focuses on common clinical situations where appropriate decision
making is important to the outcome of the case. Numerous areas of
medicine and anesthesia will be covered to provide the student
with a wide sampling of decisions made each day with patient care.
This course supplements the other courses offered during the spring
semester by integrating and applying basic science knowledge to the
care of patients. Prereq: Consent of department.

ANES 478. Clinical Decision Making in Anesthesia II. 2 Units.
Guided and targeted discussion on common anesthetic considerations
relegated by co-existing disease, comorbidity, anatomy, surgical
procedures and common practice. Prereq: ANES 477.

ANES 480. Fundamentals of Anesthetic Sciences I. 1 Unit.
A continuum of courses over the fall and spring semesters that covers
a series of topics in basic medical science with special emphasis on
the effect of anesthetics on normal physiology. An examination is
administered at the end of each semester.

ANES 481. Fundamentals of Anesthetic Sciences II. 1 Unit.
A series of topics in basic medical science with special emphasis on
the effect of anesthetics on normal physiology. An examination is
administered at the end of the semester. Prereq: ANES 480.

ANES 485. Introduction to Physiological Model-Based Simulation. 1 Unit.
Introduction to physiological model-based simulation using on-screen
computer simulation and mannequins. Emphasis is placed on improving
appropriate anesthesia-related basic science knowledge, manual skills
in anesthesia machine checkout, drug and equipment setup, safety
inspections, and performing anesthesia for uncomplicated surgical
cases.

ANES 486. Physiological Model-Based Simulation I. 1 Unit.
An extension of ANES 485 with emphasis on improving or exercising
knowledge of anesthesia-appropriate basic science, the use of more
advanced equipment and techniques for uncomplicated surgical cases
with an introduction to crisis management. Recommended preparation:
ANES 485.

ANES 487. Physiological Model-Based Simulation II. 1 Unit.
An extension of ANES 486 emphasizing the physical techniques aspects
of crisis management, team work and rescue in anesthesia, including
support for and review of training in Basic Life Support and Advanced
Cardiac Life Support. Recommended preparation: ANES 486.
ANES 488. Anesthesia Non-Technical Skills Lab. 1 Unit.
In this course the student will learn anesthesia non-technical skills, which are used integrally with medical knowledge and clinical techniques. They encompass both interpersonal skills (e.g. communication, team working, leadership) and cognitive skills (e.g. situation awareness, decision making). This course uses modified Crew Resource Management techniques taught in the aviation industry and considers the limitations of human performance and the nature of human error. The goals are to train individuals to avoid, capture and mitigate against the consequences of error. During the course, behaviors shown to minimize errors and maximize patient safety are highlighted and then practiced, with feedback being given to students on their performance.

ANES 490. Ethics, Law and Diversity for Anesthesiologist Assistants. 2 Units.
This course will focus on three topics. First, a discussion of legal practice as it applies to health care including basics of medical jurisprudence, negligence, and how to avoid a lawsuit. Second, a discussion of ethical theory including the principles of medical ethics, do not resuscitate, truth telling, and assessment of competence. Last, a discussion on diversity that will focus on the differences and similarities among people and how these factors influence patient care. The final grade will be based on an essay and a multiple choice exam.

ANES 499. Clinical Remediation. 1 - 10 Units.
(Credit as arranged.) Course offered to the student one time during the program of study which remediates "C" or below work in a clinical course.

ANES 580. Fundamentals of Anesthetic Sciences III. 1 Unit.
The second-year equivalent of ANES 480 and ANES 481. An examination is administered at the end of the semester. Recommended preparation: ANES 480 and ANES 481.

ANES 581. Fundamentals of Anesthetic Sciences IV. 1 Unit.
The second year equivalent of ANES 481. An examination is administered at the end of the semester. Prereq: ANES 580.

ANES 584. Physiological Model-Based Simulation III. 1 Unit.
An extension of ANES 487 emphasizing the physical techniques and aspects of crisis management, team work, and rescue in anesthesia. Prereq: ANES 487.

ANES 585. Physiological Model-Based Simulation IV. 1 Unit.
Extension of ANES 584 emphasizing the physical techniques and aspects of crisis management, team work, and rescue in anesthesia. Prereq: ANES 584.

ANES 599. Clinical Remediation. 1 - 10 Units.
(Credit as arranged.) Course offered to the student one time during the program of study which remediates "C" or below work in a clinical course.