

## APPENDIX VIII COURSE DESCRIPTIONS FOR ANESTHESIA TECHNOLOGY

### COURSES DESCRIPTION

#### **UNI 101            First-Year University experience            3cr**

This course acclimates and prepares students for university life. It introduces students to academic practices such as critical reading and thinking, study and research skills, information literacy, cultural diversity, and collaborative learning within an American Style liberal arts educational environment.

Prerequisite: None.

#### **ENL 101            Expository Writing            3cr**

This course will enable students to practice writing in several contexts and forms (from personal narrative to inquiry and argument). They will develop increasingly complex essays incorporating the ideas and language of other writers in placing their voice within academic or public debates.

Prerequisite: None.

#### **BIO 101            Introductory Biology            3cr**

This course covers basic concepts in biology. An introduction to the basis of life, structure and function of cells and systems, forms and functions of plants and animals, as well as genetics, evolution, and ecology.

Prerequisite: None.

#### **CHE 105            Chemistry for Healthcare Professions            3cr**

Topics in this course include atoms and elements in the periodic table; ionic and covalent bonds and their compounds; stoichiometry and chemical reactions; energy and states of matter; gases; solutions; acids and bases, and nuclear medicine.

Prerequisite: None.

#### **HCT 101            Fundamentals of Healthcare Professions            3cr**

This course provides students with an overview of the various health professions by covering and discussing fundamental aspects of the healthcare system. It includes an overview of healthcare development, how health delivery systems are structured, legal and ethical considerations of healthcare delivery, and an overview of various healthcare professions. Students are encouraged to discover health professions through assignments, observations, and interviews.

Prerequisite: None.

#### **CSC 101            Introduction to Computer Science            3cr**

This course covers the fundamentals of computers and computer nomenclature, particularly with respect to personal computer hardware and software used in today's business environment. Students will survey and use business applications programs utilizing pre-written programs that include word processing, spreadsheets, databases, presentation graphics, and web browsers. Students completing the course will have a solid understanding of computer concepts, how to use computers in today's business world, and how to access information on the World Wide Web.

Prerequisite: None.

#### **MAT 101            College Algebra            3cr**

This course introduces the idea of multiple representations of linear and non-linear functions. Includes mathematical concepts for understanding rational numbers, various expressions, analyzing and solving linear equations & inequalities, data analysis, probability, statistics, and polynomials. Has hands-on material providing the student with problem solving skills where algebra concepts are applied.

Prerequisite: None.

**PHI 101                      Introduction to Ethics                      3cr**

This course provides a grounding in classical and historical ethics (eastern and western) with an “applied” focus. The students will connect ethical and moral considerations to real-world scenarios (in business, for example, or when discussing the environment) that will introduce how and why ethics matter in every discipline or profession they may choose to study. Topics may include environmental ethics, liberty, morality, and war.

Prerequisite: None

**BIO 217                      Human Anatomy and Physiology                      3cr**

This course introduces students to the anatomy and physiology of the human body with an emphasis on the skeletal, muscular, cardiovascular, renal, immune, nervous, endocrine, gastrointestinal, respiratory, and reproductive systems. A comprehensive knowledge of homeostatic regulation in the functions of the body and a discussion of imbalances to homeostasis will be covered.

Prerequisite: BIO 101.

**BIO 217L                      Human Anatomy and Physiology Lab                      1cr**

Co-requisite: BIO 217.

**ANT 101                      Introduction to Anesthesia Technology                      3cr**

This course is an introduction to the basics of the anesthesia specialty, including general, regional, and sedation anesthesia. It explores the history of non-physician anesthesia, ethical considerations, and legal aspects governing the profession, as well as the scope of practice of anesthesia technologists, their duties and responsibilities in the healthcare setting and their relationship with other healthcare professionals. Moreover, the course outlines the standard of care and procedural requirements in anesthesia practice. Students will also acquire a fundamental knowledge of the anesthesia equipment, surgical anesthesia environment, and workplace management and safety.

Prerequisite: None.

**HIS 101                      Civilizations and History                      3cr**

This course considers the arts, history, government, philosophy, and religion in a pluralistic, global context to help students see and think beyond typical dichotomies, such as east versus west, from antiquity through 1500.

Prerequisite: None

**ENL 201                      Academic Writing                      3cr**

This course enables students to demonstrate critical reading, interdisciplinary investigations, and research skills practiced in their core courses by investigating more deeply a question or idea raised in their core coursework and exploring topics in their proposed major.

Prerequisite: ENL 101.

**CHE 215                      Biochemistry for Health Care Professions                      3cr**

The chemistry of biomolecules and their utilization in metabolism will be studied. It is one semester course covering the following topics: organic chemistry of major functional groups, structure and functions of carbohydrates, lipids, proteins, and nucleic acids enzymes and the use of cofactors & coenzymes; ; carbohydrates metabolism; aerobic respiration and energy production;; fatty acid, and amino acid pathways. (Prerequisite: CHE105)

**ANT 240                      Anesthesia Technology Instrumentation                      3cr**

This course focuses on familiarizing students with the equipment and instrumentation used in providing general, regional, and sedation anesthesia in both basic and complex situations. The anesthetic equipment described in this course includes but is not limited to the anesthesia machine, airway equipment, and ancillary anesthetic equipment including gas cylinders, ventilators, pulse oximetry, and absorbers. For every device described, mechanical and electrical characteristics of anesthesia delivery systems will be addressed, and students will learn how to set up, calibrate, operate, troubleshoot, maintain, and apply safety guidelines whilst using the devices.

Prerequisites: ANT 101; BIO 217.

**ANT 240L                      Anesthesia Technology Instrumentation Lab                      1cr**

This laboratory course is a hands-on and applied laboratory course provided concomitantly with the ANT 240 (Anesthesia Technology Instrumentation) didactic course.

Prerequisites: ANT 101; BIO 217.

Co-requisite: ANT 240.

**HIS 102                      The Civilizations and History II                      3cr**

This course considers the arts, history, government, philosophy, and religion in a pluralistic, global context to help students see and think beyond typical dichotomies, such as east versus west, from 1500 through the Modern Era.

Prerequisite: None.

**ENL 210                      Introduction to Public Speaking                      3cr**

Introduction to Public Speaking strengthens student's reasoning skills and understanding of the various rhetorical strategies available to them in both the writing process and in speaking publicly. Students are required to practice ethical integration and documentation of sources into speeches. The course is designed to introduce students to extemporaneous and both planned and documented types of speaking. To this end, students will be required to do research on topics and give oral presentations to the class based on their research. This course strongly reinforces the connection between writing and speaking.

Prerequisite: ?.

**BIO 218                      Pathophysiology                      3cr**

The study of the disturbance of normal mechanical, physical, and biochemical functions, either caused by a disease, or resulting from a disease or abnormal syndrome or condition that may not qualify to be called a disease. Emphasis is on interrelationships among organ systems in deviations from homeostasis.

Prerequisite: BIO 217.

**BIO 2XX      Biostatistics and Epidemiology      3cr**

The purpose of this course is to provide students with knowledge on qualitative and quantitative research using biostatistics and epidemiology calculation methods and tools. Exclusion and inclusion criteria, as well as collection, entry, and analysis of data using different methods will be described. The course also covers the statistical methods used in the assessment of epidemiological distributions. Topics include research methods and design, descriptive statistics, performance characteristics of diagnostic tests, graphical methods, probability, estimation, hypothesis testing, p-values, regression and correlation, and clinical trials.

Prerequisite: CSI 101; MAT 101.

**ANT 245      Pharmacology in Anesthesia Practice      3cr**

This course describes the relationship between pharmacology and physiology, drug mechanisms, pharmacodynamics and pharmacokinetics of anesthetic agents and analgesic agents, as well as their actions, interactions, and drug-receptor interactions. The course also focuses on the effects of anesthetic drugs on body systems pertinent to anesthetic procedures and practice, including the nervous, cardiovascular, and respiratory systems. Cases studies are included in the course material. Pharmacotherapy of anesthesia agents in specialized populations, including elderly and children will also be discussed.

Prerequisite: CHE 105; BIO 217.

**HUM 101      Introduction to Humanities      3cr**

This course explores how individuals and societies express themselves—the ideas, values, and spirituality that connect them—through art, architecture, dance, literature, music, philosophy, and religion. Focus is placed on an interdisciplinary approach to “what it means to be human,” to comparing how different creative forms tackle fundamental societal questions: who are we? Why do we come together? how do we describe our relationship to a ‘higher being’? how do we relate to the environment around us? Why do we go to war?

Prerequisite: None.

**ANT 295      Practicum II      3cr**

In this course, students are required to complete clinical rotations at various medical and healthcare institutions. Every student will be mentored by at least one clinical preceptor and will be asked to apply their knowledge about anesthesia in a variety of real-life cases. During this Practicum, students are expected to to both observe and apply their learning.

Prerequisites: ANT 240; ANT 240L.

**ANT 320      Anesthesia Clinical Applications I      3cr**

The purpose of this course is to impart in-depth information about the anesthesia management plan for the following anesthesia subspecialties: general, gastrointestinal, obstetric, gynecologic, and genitourinary. For each subspecialty, students will learn to prepare and implement an anesthetic plan in the cases of general, regional, and sedation anesthesia, and will acquire the knowledge related to the technique, anatomy, and pathophysiologic implications.

Prerequisite: ANT 240.

**ANT 320L      Anesthesia Clinical Applications I Lab      1cr**

Co-requisite: ANT 320.

**ANT 340                    Anesthesia Agents and Methods                    3cr**

This course offers a complete overview of the various classes of anesthetic agents and analgesics pertaining to anesthesia. Calculation of dosages, physics gas laws, and routes of administration will be addressed in detail. Students will also learn guidelines and safety practices in the storage, preparation, and safe disposal of anesthetic agents. Effects of anesthesia agents in specialized populations, including elderly and children will also be discussed.

Prerequisites: ANT 240; ANT 245.

**ANT 340L                    Anesthesia Agents and Methods Lab                    1cr**

Co-requisite: ANT 340.

**ANT 330                    Patient Monitoring Technology                    3cr**

This course details the procedures and set of standards required in the organization and maintenance of the anesthesia workplace throughout patient clinical monitoring. The course provides students with a working knowledge of devices and equipment used in real-time monitoring of patients under general, regional, or sedation anesthesia. Oxygenation, ventilation, temperature, urine output, hemodynamics, and neurological status are among the parameters that will be described about patient monitoring. Point-of-care testing and its more advanced technologies including Point-of-Care Ultrasound (POCUS) will also be addressed.

Prerequisite: ANT 240; ANT 245.

Co-requisite: ANT 340.

**ANT 343L                    Operating Room Simulation Lab                    1cr**

This immersive and simulation-based high-fidelity course provides anesthesia technology students with the opportunity to demonstrate clinical applications of anesthesia in a simulated operating room environment. In the mock operating room, control room, and debriefing room, students will be taught to use their knowledge and critical thinking in a variety of case scenarios. Simulations will include the pre-operative assessment of the patient, preparation of the anesthetic plan, induction, maintenance, and emergence phases of anesthesia. This course also offers an opportunity for students to train on practicing vigilance in the delivery of patient care, developing their decision-making skills, and interpersonal dynamics.

Prerequisite: ANT 240L.

**ANT 350                    Anesthesia Clinical Applications II                    3cr**

The purpose of this course is to impart in-depth information about the anesthesia management plan for the following anesthesia subspecialties: ophthalmic, head and neck, plastic, and reconstructive. For each subspecialty, students will learn to prepare and implement an anesthetic plan in the cases of general, regional, and sedation anesthesia, and will acquire the knowledge related to the technique, anatomy, and pathophysiologic implications. The purpose of this course is to impart in-depth information about the anesthesia management plan for the following anesthesia subspecialties: pediatric, neonatal, and geriatric, as well as anesthesia in the cases of special medical conditions and co-existing diseases. For each subspecialty, students will learn to prepare and implement an anesthetic plan in the cases of general, regional, and sedation anesthesia, and will acquire the knowledge related to the technique, anatomy, and pathophysiologic implications.

Prerequisite: ANT 240.

Prerequisite: ANT 240.

**ANT 360                      Perioperative Patient Care                      3cr**

This course aims to provide students with the knowledge required in the assessment and care of patients during the preoperative, operative and postoperative process. After learning about postoperative complications, students will learn to assess risks by performing a preoperative evaluation of the patient by collecting medical history information and using physical exams, including cardiac, airways exams, and the Mallampati Score. Signs of perioperative complications associated with chronic illnesses such as cardiovascular diseases, diabetes, and renal deficiency will be identified and management strategies will be detailed. In addition to preoperative assessment, students will learn intraoperative and postoperative interventions. This course also provides students with a working knowledge of devices and equipment used in the peri-operative clinical monitoring of patients.

Prerequisite: ANT 240.

**ANT 370                      Workroom Management                      1cr**

This course aims to teach students on the best strategies to interact optimally with their work environment with the aim to enhance patient care, promote safety, and improve well-being. Emphasis will also be placed on learning how to prepare and implement an anesthetic plan.

Prerequisite: ANT 240.

**HCT 4XX                      Technical Elective                      3cr**

This course and all technical elective courses aim to develop new professional skills and/or build upon skills the student obtained from previous courses. Technical elective courses are chosen from a list of courses approved by the College of Healthcare Technologies.

Prerequisite: None.

**ANT 390                      Postanesthetic and Pain Management                      3cr**

This course starts with a description of the physiology of pain and the response to surgical stress. Then, it discusses key components of postoperative analgesia in the adequate management of acute and chronic pain, particularly in regional anesthesia. Multimodal analgesia will be described in detail including classes of systemic analgesic medications, uses, doses, routes of administration, and their importance in controlling over-reliance on opioids. The use of preventive analgesia in the control of central sensitization will also be addressed in detail.

Prerequisite: ANT 340.

**ANT 399                      Practicum II                      3cr**

In this course, students are required to complete clinical rotations at various medical and healthcare institutions. Every student will be mentored by at least one clinical preceptor and will be asked to apply their knowledge about anesthesia in a variety of real-life cases. During this Practicum, students are expected to both observe and apply their learning.

Prerequisites: ANT 240; ANT 240L.

**SOC 101                      Introduction to Sociology                      3crs**

Covers basic theory and research methods common to the study of society. Surveys development of societies, social interactions, social organization, social institutions, and social change.

Prerequisite: None.

**ANT 420                      Anesthesia Clinical Applications III                      3cr**

The purpose of this course is to impart in-depth information about the anesthesia management plan for the following anesthesia subspecialties: cardiothoracic and vascular surgeries as well as neurosurgeries. For each subspecialty, students will learn to prepare and implement an anesthetic plan in the cases of general, regional, and sedation anesthesia, and will acquire the knowledge related to the technique, anatomy, and pathophysiologic implications.

Prerequisite: ANT 350.

**ANT 460                      Anesthetic Emergencies                      3cr**

This course provides detailed procedural guidelines about immediate management of common emergencies occurring during anesthetic interventions, inside and outside the operating room. Airway emergencies, including “can’t intubate, can’t ventilate” situations, allergies and anaphylaxis, local anesthetic toxicity, and malignant hyperthermia will be described in detail. Students will address various scenarios of emergencies and familiarize themselves with analgesics and equipment options. Point-of-care testing and its more advanced technologies including Point-of-Care Ultrasound (POCUS) will also be described.

Prerequisite: ANT 330.

**ANT 460L                      Anesthetic Emergencies Lab                      1cr**

Students will train on a variety of scenarios of anesthesia emergencies in the simulation lab.

Prerequisite: ANT 343L.

Co-requisite: ANT 460.

**ANT 410                      Special Topics in Anesthesia Technology                      1cr**

In this course, students will be addressing anesthesia cases, gaining experience through the critical reading of scholarly articles, and evaluating case reports from the literature. Their work will be delivered in the form of group work and presentations.

Prerequisite: ANT 320.

**ANT 430L                      Anesthesia Quality Assurance Lab                      1cr**

This course takes place in the anesthesia simulation laboratory and aims to test the students on 1) their knowledge of a variety of guidelines including the most updated pre-anesthesia checkout procedures and the safety guidelines established by the Quality Management and Departmental Administration (QMDA) of the American Society of Anesthesiologists (ASA) and other standardized quality management guidelines, and 2) an array of case scenarios that require quality improvement. Students will be asked to capture cases of adverse events, review relevant medical reports, troubleshoot them, and make system changes to prevent errors re-occurrence. They will also learn to check and calibrate equipment, establish check lists, and design anesthetic processes to minimize the risk of errors and improve patient safety.

Prerequisite: ANT 350.

**ANT 490                      Practicum III                      3cr**

In this course, students are required to complete clinical rotations at various medical and healthcare institutions. Every student will be mentored by at least one clinical preceptor and will be asked to apply their knowledge about anesthesia in a variety of real-life cases. During this Practicum, students are expected to both observe and apply their learning.

Prerequisite: ANT 399.

**PSY 101                      Introduction to Psychology                      3cr**

This course introduces the principles of psychology. It considers sensation, perception, cognition, learning, physiological psychology, personality, development, psychopathology, social psychology, methodology, assessment, and history of psychology with an emphasis on how the science of psychology impacts everyday life.

Prerequisite: None

**HCT 4XX                      Technical Elective                      3cr**

This course and all technical elective courses aim to develop new professional skills and/or build upon skills the student obtained from previous courses. Technical elective courses are chosen from a list of courses approved by the College of Healthcare Technologies.

Prerequisite: None

**ANT 455                      Anesthetic Procedural Blocks                      3cr**

This course focuses on regional anesthetic nerve block and emphasizes local anesthetic nerve block, neurolytic block, and neurectomy. It offers students an in-depth knowledge of blocks, vascular access techniques, as well as point-of-care ultrasound. Combinations of anesthetics for optimal analgesia will also be described.

Prerequisite: ANT 350.

**ANT 495                      Practicum IV                      3cr**

In this course, students are required to complete clinical rotations at various medical and healthcare institutions. Every student will be mentored by at least one clinical preceptor and will be asked to apply their knowledge about anesthesia in a variety of real-life cases. During this Practicum, students are expected to both observe and apply their learning.

Prerequisite: ANT 490.

**ANT 496                      Practicum IV                      3cr**

In this course, students are required to complete clinical rotations at various medical and healthcare institutions. Every student will be mentored by at least one clinical preceptor and will be asked to apply their knowledge about anesthesia in a variety of real-life cases. During this Practicum, students are expected to both observe and apply their learning.

Prerequisite: ANT 490.

**Technical Electives**

**HCT 480                      Marketing in the Healthcare Sector                      3cr**

The course on marketing in the healthcare sector is designed to provide students with a comprehensive understanding of the marketing principles and their application in the healthcare industry. The course will cover various aspects of healthcare marketing such as market research, consumer behavior, branding, product development, pricing, distribution, and promotion. Students will learn how to apply marketing concepts to real-world healthcare scenarios, including the marketing of medical devices, pharmaceuticals, hospitals, and other healthcare services. The course will also cover regulatory considerations and ethical



issues in healthcare marketing. The goal of this course is to equip students with the knowledge and skills required to develop and execute effective marketing strategies in the healthcare sector.

Prerequisite: None.

**HCT 481                      Health Informatics                      3cr**

This course describes the fundamental principles, concepts, and technological elements that make up the building blocks of Health Informatics. The course introduces fundamental characteristics of data, information, and knowledge in the domain, the common algorithms for health applications, and IT components in representative clinical processes. It also introduces the conceptual framework for handling the collection, storage, and the optimal use of biomedical data, as well as the concepts of population health and precision medicine and the information systems that support them. Emphasis is on the basic principles of knowledge management systems in biomedicine, various aspects of Health Information Technology standards, and IT aspects of clinical process modeling.

Prerequisite: None.

**HCT 482                      Leadership in Healthcare                      3cr**

This course provides students with an in-depth understanding of the principles and practices of leadership within healthcare. Students will learn about the various leadership styles, strategies, and theories and how they can be applied in the field of radiologic sciences. Through interactive lectures, group discussions, and case studies, students will learn how to develop their leadership skills, communicate effectively, build and lead teams, manage change, and handle challenges in the workplace. The course will also cover the importance of ethical leadership, diversity, and inclusion in the workplace. This course is designed for students who wish to take on leadership roles in the radiologic sciences or pursue careers in management, administration, or education. By the end of the course, students will have a strong foundation in the principles and practices of leadership and will be well-equipped to apply their skills and knowledge in their future careers.

Prerequisite: None.

**HCT 483                      Introduction to Clinical Research                      3cr**

This course provides an overview of the fundamental concepts, principles, and practices involved in clinical research and research works involving human subjects. The course covers the process of designing, conducting, and analyzing clinical research, with a focus on ethical considerations, human subject protection, regulatory requirements, and the impact of clinical research on healthcare delivery and patient outcomes. Documentations required in clinical research will be described, and responsibilities of agencies and organizations responsible for human subject protection will be identified.

Throughout the course, students will learn about the different types of clinical research studies, including observational, interventional, and registry studies. They will also learn about the key components of a clinical study protocol, including eligibility criteria, randomization, and blinding.

Prerequisite: HCT 331.

