

Department of Anatomy, Cell Biology and Physiology

Chairperson:	Al-Chaer, Elie D.
Emeritus Professor:	Jabbur, Suhayl
Professors:	Al-Chaer, Elie D.; Barada, Kassem; Bazarbachi, Ali; Birbari, Adel; El-Sabban, Marwan; Jurjus, Abdo; Mourad, Fadi; Muhtasib, Hala;
Associate Professors:	Eid, Assaad; Nasr, Rihab; Saab, Raya
Assistant Professors:	Abou-Kheir, Wassim; Daoud, Georges; Lawand, Nada B.; Nassar, Dany; Zeidan, Asad
Associates:	Kibbi, Abdul-Ghani; Husari, Ahmad; Rebeiz Abdallah

The Department offers three disciplines of study: Anatomy and Cell Biology, Physiology, and Basic Neuroscience. Each discipline provides courses to medical, graduate, paramedical and undergraduate students.

The graduate program is broad, leading to a master's degree (MS) or doctoral degree (PhD) in Biomedical Sciences. Students with a BS degree or its equivalent in mathematics, biology, physics, or chemistry, as well as advanced courses in physiology and other medical science disciplines, are eligible to apply. The department may ask for specific prerequisites in certain disciplines, such as biology and chemistry as deemed necessary.

Anatomy and Cell Biology

Required courses for the discipline of Anatomy and Cell Biology include: BIOC 323 (2 cr.); PHYL 310 (3 cr.); HUMR 309 (5 cr.); HUMR 308 (3 cr.); HUMR 314 (1 cr.); HUMR 310 (2 cr.).

HUMR 244 Introduction to Human Biology 32.0; 2 cr.
An introductory course that meets the needs of a diverse group of students who are preparing for careers in allied health sciences, medical technologies or other non-medical careers like psychology or biomedical sciences; It introduces the students to the very basic terms and concepts in anatomy, histology and physiology. The course covers the basic biology of the cells, tissues, and organs of the human body.

HUMR 246 Human Morphology for Paramedical and Undergraduate Students 32.32; 3 cr.
An introduction to basic gross anatomy and histology. Offered to Nurses and other undergraduate students.

HUMR 248 Human Anatomy and Physiology 60.30; 5 cr.
A course that aims to provide a strong foundation for understanding the structural complexities of the human organism and the related physiological functions. The course, as conceived, will integrate structure and function and offer practical advantages in fine-tuning the balance between anatomy, histology and physiology. In addition, clinical correlations will be included for a vertical integration in addition to the horizontal integration. *Prerequisites: HUMR 244.*

- HUMR 305 Cell and Tissue Biology 30.33; 3 cr.**
Consists of the first half of Basic Histology, HUMR 209, covering cells and tissues. *Open to graduate students outside the department.*
- HUMR 306 Organ Histology 28.36; 3 cr.**
Consists of the second half of Basic Histology, HUMR 209, covering organs and systems. *Open to graduate students. Prerequisite: HUMR 305 or equivalent.*
- HUMR 307 Gross Anatomy 24.198; 7 cr.**
A regional dissection of the entire human body supplemented by embryology, clinical lectures, and discussions. The student is also introduced to radiographic anatomy based on various imaging modalities, in addition to computer-assisted instruction. *Required of all medical students. Open to all graduate students in the department.*
- HUMR 308A Neuroanatomy 28.39; 3 cr.**
The neuroanatomy component of Neuroscience, IDTH 208. *Open to graduate students.*
- HUMR 309 Basic Histology 58.69; 6 cr.**
A study of the cells, tissues, and organs of the human body at the level of the light and electron microscopes, utilizing traditional and advanced methodologies. Structure is related to function with some clinical application. Required of all medical students. *Open to all graduate students in the department.*
- HUMR 310 Biomedical Research Techniques 28.46; 3 cr.**
A guided laboratory course in research methods used in cell biology and physiology. *Open to graduate students.* The course is made of three modules that can be selected all or as one module per speciality as follows:
- HUMR 310A Cell Biology Techniques 10.15; 1 cr.**
- HUMR 310B Genomics and Proteomics 10.15; 1 cr.**
- HUMR 310C Mouse Models and *in vivo* Studies 8.16; 1 cr.**
- HUMR 312 Anatomy Tutorial 0.64; 2 cr.**
A guided literature review of special research topics.
- HUMR 313 Directed Reading and Research 0.32-66; 2 cr.**
Specific reading and research assignments under supervision of an advisor. *At the discretion of the thesis supervisor.*
- HUMR 314/315 Research Seminar 0.32; 1 cr.**
Presentation and discussion of timely research topics designated by members of the department.
- HUMR 316 Principles of Electron Microscopy 32.0; 2 cr.**
Lectures on, and demonstration of, basic techniques of electron microscopy. *Alternate years.*

HUMR 318 Principles of Histochemistry 16.48; 3 cr.
Lectures, demonstration, and laboratory work related to the principal techniques of histochemistry, including immuno-histochemistry. *Prerequisite: HUMR 305 or HUMR 309.*

HUMR 319 Biology of Nerve and Muscle
Equivalent to IDTH 309. *See Interdepartmental Teaching.*

HUMR 346 Human Morphology for Graduate Students 48.32; 4 cr.
A course that includes the embryology component of HUMR 207, the whole of HUMR 246, and an experimental anatomy part.

HUMR 395A/B Comprehensive Exam 0 cr.
Prerequisite: Consent of advisor.

HUMR 399 MS Thesis 9 cr.
A/B/C/D/E
Original research under faculty supervision leading to the MS degree.

HUMR 260 Elective in Human Morphology 0.180-360
An elective for Medicine III and IV in which the student can select one or more disciplines within the department including applied immunology, general surgical anatomy, radiographic anatomy, experimental neuroanatomy, neuromuscular disorders, techniques for study of cells and tissues, and experimental neuropathology. *One to two months.*

Physiology

Required courses for the discipline in Physiology include: BIOC 325 (2 cr.); PHYL 300 (2 cr.); PHYL 310 (3 cr.); PHYL 302 (2 cr.); PHYL 308 (3 cr.); HUMR 305 (3 cr.); HUMR 314 (1 cr.); HUMR 310 (2 cr.); PHYL 304 (3 cr.).

PHYL 246 Human Physiology for Paramedical and Undergraduate Students 48; 4 cr.
The course outlines fundamental principles of human physiology and the mechanisms governing the function of different body organs. *Prerequisites: BIOC 246 and BIOL 201 (or BIOL 210).*

PHYL 260 Elective in Physiology 0.180-360.
The course covers one or more areas of physiology such as special physiologic techniques, general physiology, experimental gastroenterology, experimental neuroscience, and the physiology of cardiac and vascular smooth muscles. *One to two months.*

PHYL 300 Homeostasis 32.6; 2 cr.
The course studies the internal environment and its physiological regulation by two homeostatic organs: the lungs and the kidneys. Didactic lectures cover the physiology of the topic, treating internal environment, homeostasis and feedback mechanisms, the lung, the kidney, and electrolytes. *Open to all graduate students in the department.*

PHYL 395A/B Comprehensive Exam**0 cr.***Prerequisite: Consent of advisor.***PHYL 399 MS Thesis
A/B/C/D/E****9 cr.**

Original research under staff supervision, leading to the MS degree.

Neuroscience

Required courses for the discipline in Neuroscience include: BIOC 325 (2 cr.); PHYL 310 (3 cr.); PHYL 308 (3 cr.); HUMR 305 (3 cr.); HUMR 308 (3 cr.); HUMR 314 (1 cr.); HUMR 310 (3 cr.).

IDTH 208 Basic Neuroscience**6 cr.***See Interdepartmental Teaching.***HUMR 308 Neuroanatomy****28.39; 3 cr.**The neuroanatomy component of Neuroscience, IDTH 208. *Open to graduate students.***PHYL 308 Neurophysiology**Similar to PHYL 208 and to IDTH 308B. *Open to graduate students***HUMR 261 or PHYL 261 Elective in Basic Neuroscience****0.180-360**

Open to Medicine III and IV students, graduate students in the combined MS-MD program and visiting medical students. The objective of this elective is to involve the students in a basic research project as part of the on-going studies in the neuroscience research laboratories of the Department.

IDTH 395A/B Comprehensive Exam**0 cr.***Prerequisite: Consent of advisor.*