

**UNIVERSITY OF TEXAS MEDICAL BRANCH  
GRADUATE SCHOOL OF BIOMEDICAL SCIENCES  
BASIC BIOMEDICAL SCIENCE CURRICULUM  
ESSENTIAL FUNCTIONS**

***OBSERVATION (TO INCLUDE THE VARIOUS SENSORY MODALITIES):***

Students must be able to decode written documents and hear in situations when not able to read lips. Students must be capable of learning and assimilating laboratory skills. They must be able to accurately observe near and distant objects in order to learn techniques conduct experiments, and gather reliable data using a variety of sensory modalities. For instance, students must be able to observe and comprehend an instructor's /mentor's physical movements as they manipulate laboratory equipment, experimental animals, cells and reagents; a patient's gait or verbal response; a chemical reaction or experimental results (e.g., color change, banding on gels, odor, viscosity, temperature); a microscopic or computer image or gross anatomical specimen. They must be able to process auditory information such as signals from instruments, animal vocalizations, and verbal input from instructors, colleagues or experimental subjects/patients. Students must be able to process, retain, and integrate information from a variety of sources, including, but not limited to: oral delivery by instructor(s) or student(s); blackboard data and diagrams; printed material (handouts, journals, manuals, books, medical records, computers, computer print-outs); PowerPoint presentations; overhead transparencies; slides; film and video segments; audio recordings; live demonstrations; one-to-one and group interactions in the classroom; demonstrations; and internet based or teleconferences.

***COMMUNICATION:***

Communication skills are critically important in science, academics and research, since teaching is done, results are reported, and information is shared. Students must be able to communicate (speak, write, read, comprehend) effectively and efficiently in the English language. They must be capable of communicating the background, hypothesis, goals, results and interpretations of their research projects to other students, faculty and visitors. In addition, they must be able to communicate basic information in their area of research and related fields to other students, workers and visitors. They must be able to respond to questions asked or problems formulated and to ask pertinent questions in a one-on-one, small group or large group format.

***PSYCHOMOTOR SKILLS:***

Students must have sufficient motor capacities and mobility to attend class. They must be able to manipulate a standard or adapted computer keyboard. Physically, they must be able to carry out laboratory experiments at a standard height or adapted laboratory bench. They must be able to dress in protective clothing such as lab coats and disposable gloves. Students must have sufficient motor capacity (e.g., strength, dexterity and coordination) to be able to use multiple types of laboratory equipment including but not limited to

microscopes, centrifuges, spectrophotometers, computers, and dissecting/surgical instruments. Students must be able to independently retrieve from storage, lift, move and manipulate equipment (some of which is highly delicate and sophisticated with fine controls), animal cages, cans and bottles of reagents and other essential supplies as necessary to execute various types of experiments. If appropriate to their research, they may also have to become proficient in the handling of experimental animals. Students must also be able to perform fine motor tasks such as stereotactic surgery, dissections, or positioning of micropipettes or recording electrodes with the aid of micromanipulators. They must be able to handle, transfer and manipulate, using acceptable protocol, reagents in quantities as appropriate to their research, including hazardous materials such as radio labeled materials and hazardous chemicals.

### ***INTELLECTUAL AND COGNITIVE ABILITIES:***

Students must be able to think creatively and systematically. They must be able to measure, calculate, reason, analyze, synthesize, integrate, remember and apply information for the purposes of developing models, analyzing data, writing papers, and making presentations. Creative problem solving and reasoning require all of these intellectual abilities in order to generate and test hypotheses. Students must be able to comprehend three-dimensional relationships and understand the spatial relationships of structures. They must be able to translate information from printed reports to actual hands-on laboratory experiences. This will involve the integration of their classroom experiences with those obtained from interaction with other scientists and trainees, from reports in the literature as well as knowledge developed from working in the laboratory. They must be able to apply information from these varieties of sources to their own research problems and generate and test working hypotheses. They must develop and sustain a strong motivation for biomedical research. They must be able to develop new techniques as needed to advance their research project. Each must become proficient in the statistical analysis and interpretation of experimental observations.

### ***PROFESSIONAL AND SOCIAL ATTRIBUTES:***

Students must exercise good judgment and promptly complete all responsibilities expected by the courses, curriculum and program in which they are enrolled. They must develop mature, sensitive and effective professional relationships with peers, colleagues and faculty, be able to function as a part of a team, and negotiate conflicts satisfactorily and fairly. They must be capable of significant workloads that require long hours, attention to detail, and accurate and thorough recording of experiments and data, hence students must be able to adapt positively to stress and assume responsibility and accountability for their actions. They must be able to adapt to changing environments, display flexibility, patience and open-mindedness, and function in the face of uncertainties and ambiguities. Concern for others, appreciation of the support of the public, competence in inter-personal relationships, and demonstrated motivation and commitment are expected of all students. Students must be able to focus their attention on activities and decision-making. They must show respect for research animals and valuable equipment. Each must conduct original research that is

reproducible and reliable. They must be able to be punctual, tolerant of the views of others, and capable of assuming responsibility for their actions. They must be able to recognize and employ socially acceptable actions and behaviors corresponding to environmental and situational demands.

***APPLICATION OF LEGAL/ETHICAL PRINCIPLES AND PROFESSIONAL STANDARDS:***

Students must demonstrate the highest standards of professional ethics, attitudes and behavior in course work, laboratories and interactions with others. They must demonstrate honesty, integrity and reliability and adhere to standards reflecting the values and functions of the scientific profession. This includes a responsibility to acquire and share data in an honest and timely manner, rights of privacy, and respect for research animals and valuable equipment. Students must apply an ethical decision making process in their studies (e.g. writing of papers, data collection), avoid plagiarism and adhere to the other legal/ethical standards set forth by the Graduate School of Biomedical Sciences of the University of Texas Medical Branch.