College of the Environment and Life Sciences  
University of Rhode Island  

Clinical Laboratory Science Program  

Department of Cell and Molecular Biology  

EXPECTED UNDERGRADUATE STUDENT OUTCOMES  

Welcome to the Clinical Laboratory Science Program of the Department of Cell and Molecular Biology in the College of the Environment and Life Sciences. During your education as an undergraduate student in the Department and the College, you will be given the opportunity to acquire the knowledge, skills and perspectives that will ensure your success after your graduation. The faculty of the Department and College are here to provide you with an excellent educational experience; in return we ask that you dedicate yourself to learning while here at URI. Your URI studies and your co-curricular experiences will help you to:  

- Build a solid base of knowledge and skills in the major that you choose,  
- Communicate effectively with the people you will encounter in your work and personal life, and  
- Develop an awareness and perspective as a member of a local, national and global community.  

Your professors in the Department of Cell and Molecular Biology and affiliated hospitals have established the following list of expectations for your learning here at URI. Please study the list and use it as your road map for your education. Review it on a regular basis and discuss it with your academic advisor. You will be amazed at your educational progress each semester and with your level of achievement at the conclusion of your undergraduate studies.  

KNOWLEDGE  

DESCRIPTION OF THE CLINICAL LABORATORY SCIENCE PROFESSION  

The clinical laboratory professional is qualified by academic and applied science education to provide service and research in clinical laboratory science and related areas in rapidly changing and dynamic healthcare delivery systems. Clinical laboratory professionals perform, develop, evaluate, correlate and assure accuracy and validity of laboratory information; direct and supervise clinical laboratory resources and operations; and collaborate in the diagnosis and treatment of patients. The clinical laboratory professional has diverse and multi-level functions in the areas of analysis and clinical decision-making, information management, regulatory compliance, education, and quality
assurance/performance improvement wherever laboratory testing is researched, developed or performed. Clinical laboratory professionals possess skills for financial operations, marketing, and human resource management of the clinical laboratory. Clinical laboratory professionals practice independently and collaboratively, being responsible for their own actions, as defined by the profession. They have the requisite knowledge and skills to educate laboratory professionals, other health care professionals, and others in laboratory practice as well as the public.

The ability to relate to people, a capacity for calm and reasoned judgment and a demonstration of commitment to the patient are essential qualities. Communications skills extend to consultative interactions with members of the healthcare team, external relations, customer service and patient education. Laboratory professionals demonstrate ethical and moral attitudes and principles that are necessary for gaining and maintaining the confidence of patients, professional associates, and the community.

**DESCRIPTION OF CAREER ENTRY OF THE CLINICAL LABORATORY SCIENTIST**

At career entry, the clinical laboratory scientist will be proficient in performing the full range of clinical laboratory tests in areas such as hematology, clinical chemistry, immunohematology, microbiology, serology/immunology, coagulation, molecular, and other emerging diagnostics, and will play a role in the development and evaluation of test systems and interpretive algorithms. The clinical laboratory scientist will have diverse responsibilities in areas of analysis and clinical decision-making, regulatory compliance with applicable regulations, education, and quality assurance/performance improvement wherever laboratory testing is researched, developed or performed. The clinical laboratory scientist will also possess basic knowledge, skills, and relevant experiences in:

A. Communications to enable consultative interactions with members of the healthcare team, external relations, customer service and patient education;
B. Financial, operations, marketing, and human resource management of the clinical laboratory to enable cost-effective, high-quality, value-added laboratory services;
C. Information management to enable effective, timely, accurate, and cost-effective reporting of laboratory-generated information, and;
D. Research design/practice sufficient to evaluate published studies as an informed consumer.

**DEPTH AND APPLICATION OF KNOWLEDGE – You will acquire knowledge and skills necessary to obtain or pursue a professional position or graduate/professional training in your discipline. By the time you complete your education you will have the knowledge of:**

1. Scientific content to encompass areas such as anatomy/physiology, immunology, genetics/molecular biology, microbiology, organic/biochemistry, and statistics.
2. Pre-analytical, analytical, and post-analytical components of laboratory services, such as hematology, hemostasis, chemistry, microbiology, urinalysis, microscopy, molecular diagnostics, immunology, and immunohematology. This includes principles and methodologies, performance of assays, problem-solving, troubleshooting, techniques, interpretation of clinical procedures and results, statistical approached to data evaluation, and continuous assessment of laboratory services for all major areas practiced in the contemporary clinical laboratory.

3. Principles and practices of quality assurance/quality improvement as applied to the pre-analytical, analytical, and post-analytical components of laboratory services.

4. Applications of safety and governmental regulations and standards as applied to laboratory practice.

5. Principles of interpersonal and interdisciplinary communication and team-building skills.

6. Principles and application of ethics and professionalism to address ongoing professional career development.

7. Education techniques and terminology sufficient to train/educate users and providers of laboratory services.

8. Knowledge of research design/practice sufficient to evaluate published studies as an informed consumer.

9. Concepts and principles of laboratory operations:
   a. Critical pathways and clinical decision making;
   b. Performance improvement;
   c. Dynamics of healthcare delivery systems as they affect laboratory service;
   d. Human resource management to include position description, performance evaluation, utilization of personnel, and analysis of workflow and staffing patterns, and;
   e. Financial management: profit and loss, cost/benefit, reimbursement requirements, materials/inventory management.

10. The U.S Health Care System.

**QUANTITATIVE COMPETENCE – You will identify and use appropriate quantitative methods to analyze physical, biological, or social phenomena, as they pertain to Clinical Laboratory Science. By the time you complete your education you will have the knowledge of:**

1. Basic mathematical and statistical terms and concepts used in Clinical Laboratory Science
2. Research methodologies

**Ability to:**

1. Use computational and analytical tools to evaluate microbiological data
2. Assess the validity of scientific data

**METHODS OF INQUIRY** – You will understand and use methods of inquiry appropriate to your discipline. By the time you complete your education you will have knowledge of:

1. Scientific method
2. The significance of Clinical Laboratory Science to everyday life

**Ability to:**

1. Formulate a clear, answerable question
2. Develop a testable hypothesis and predict expected results
3. Collect and organize data in a systematic fashion
4. Draw appropriate conclusions based on the results

**PROBLEM SOLVING** – You will use acquired knowledge, skills, and ingenuity to solve complex problems. By the time you complete your education you will have knowledge of:

1. A range of problem solving strategies

**Ability to:**

1. Use observation, experimentation, and simulation to gain knowledge
2. Recognize the limitations of the methods you use
3. Use existing information to develop problem-solving strategy
4. Evaluate results and refine strategy accordingly
5. Present data in the appropriate form

**COMMUNICATION**

**INFORMATION MANAGEMENT** – You will gather and interpret information from diverse sources. By the time you complete your education you will be able to:

1. Locate, compile, and organize information using a variety of techniques and current technology
2. Critically evaluate various sources of information

**COMMUNICATION** – You will communicate clearly and effectively using a variety of methods. By the time you complete your education you will be able to:
1. Speak in an articulate manner and present and discuss your ideas and knowledge effectively
2. Write logically and effectively for diverse audiences
3. Use discipline-specific modes, such as PowerPoint, for graphic communication
4. Be able to listen effectively and respond appropriately

MULTIDISCIPLINARY PERSPECTIVE – You will recognize the value of, and participate in, multidisciplinary teams. By the time you complete your education you will be able to:

1. Understand the perspectives and scope of related disciplines
2. Interact effectively with peers and professionals in related fields

PERSONAL GROWTH

ETHICAL PRINCIPLES – You will understand and apply ethical principles to issues, problems, and professional practices. By the time you complete your undergraduate education you will:
1. Develop a personal environmental ethic
2. Be conversant in the ethical standards of Clinical Laboratory Science

GLOBAL AWARENESS – You will develop an awareness of global community and ecology in their physical, biological, and social dimensions. By the time you complete your education you will:

1. Become familiar with the earth systems and the manner in which they have been modified by human activity over time
2. Recognize and appreciate the diversity of human and microbial interactions and their relationships to local and global ecosystems

PERSONAL DEVELOPMENT – You will develop a sense of responsibility to self, community, and society. By the time you complete your education you will:

1. Recognize the values and benefits of being a contributing member of your community and society
2. Use reflection and self-evaluation to set goals for personal improvement
3. Understand and respect differences among diverse populations
**Student Learning Outcomes**  
**Program Assessment Curriculum Map**

Curriculum maps illustrate the link between the courses and requirements in a program, to the program learning outcomes. Maps represent where students are given the opportunity to achieve the outcomes, from introduction to mastery, as they proceed through the curriculum.

To complete the matrix:
- **Across the top:** List all the courses and other program requirements (e.g., internships, service-learning, portfolios), developmentally/sequentially when possible.
- **Down the side:** List your Program Student Learning Outcomes.
- **Use the Map Key below:** Indicate the degree to which an outcome will be taught and practiced by students (I-R-E); consider the goal of key assignments and activities before assigning a code. (Courses often scaffold several outcomes, but may focus assignments on specific areas.)

<table>
<thead>
<tr>
<th>Program Student Learning Outcomes:</th>
<th>Course Numbers/Program Requirements:</th>
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<tbody>
<tr>
<td>Acquire the knowledge and skills necessary to pass the national Medical Laboratory Scientist exam, qualify for state licensure, and pursue a professional career as a Medical Laboratory Scientist</td>
<td>Program requirements can include internships, service learning, portfolios, comprehensive exams, seminars, and requirements that may not be associated with a course number.</td>
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<tr>
<td>#1</td>
<td>Course Numbers/Program Requirements:</td>
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<tr>
<td><strong>MIS 102</strong></td>
<td><strong>MIS 483</strong></td>
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<tr>
<td>I</td>
<td>I/R</td>
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<td>#2</td>
<td>Identify and use appropriate quantitative methods to analyze physical, biological, or chemical phenomena as they relate to</td>
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<td><strong>I</strong></td>
<td><strong>R</strong></td>
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# Student Learning Outcomes
## Program Assessment Curriculum Map

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<tr>
<th>Medical Laboratory Science</th>
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<td><strong>#3</strong> Understand and use methods of inquiry appropriate to Medical Laboratory Science and to solve complex problems in Laboratory Medicine.</td>
<td>I</td>
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<td><strong>#4</strong> Develop communication skills to communicate clearly and effectively using a variety of methods, including Information Technology</td>
<td>I</td>
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<td><strong>#5</strong> Understand and apply ethical principles to issues, problems, and professional practices. Develop a sense of responsibility to self, the patient, community, and society</td>
<td>I</td>
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(Form expands to accommodate program outcomes; add lines as necessary.)