

**Course Description****MLS4705 | Laboratory Operations and Management | 3.00 credits**

This course provides students with Quality Management skills necessary in the medical laboratory. Students are exposed to organizational structure along with principles for leadership and managerial decision making and process improvement along with different principles used in Laboratory Instrumentation.

**Course Competencies:**

**Competency 1:** The student will demonstrate knowledge of the principles involved in Quality Management used in the laboratory procedures by:

1. Explaining the relationship between the three levels of quality
2. Comparing and contrasting the difference between compliance and quality management
3. Listing the critical quality management systems essentials and the laboratory operations to which they are applied
4. Illustrating the role of validation in introducing a new process
5. Explaining the importance of document control for procedures

**Competency 2:** The student will demonstrate an understanding of organizational structure and look at concepts and models by:

1. Explaining some of the historical influences on organizational structures
2. Explaining the mechanistic and organic models of organizations
3. Evaluating organizational needs using an open system
4. Proposing new structures based on consumer/ patient needs and environmental forces
5. Selecting and explaining the impact of five organizational trends

**Competency 3:** The student will demonstrate knowledge of principles of leadership by:

1. Summarizing the work-related situations and describe appropriate effective and ineffective leadership styles and behaviors
2. Explaining the leadership theories X, Y and Z
3. Analyzing Full Range Leadership Theory and its components
4. Illustrating four competencies for effective leadership
5. Evaluating one's own leadership style according to leadership styles presented

**Competency 4:** The student will understand principles of electricity and electronics by:

1. Explaining why some matter carries electricity and other matters don't
2. Explaining the relationship between current, voltage and resistance and their interdependence
3. Calculating current and potential differences for a given circuit
4. Illustrating how a photomultiplier tube converts radiant light energy to an electrical pulse
5. Formulating the basic components of an electrical safety plan

**Competency 5:** The student will demonstrate the basic understanding of flame emission, atomic absorption spectroscopy and fluorometry by:

1. Explaining the principles behind flame photometer and differentiate between flame photometry and atomic absorption
2. Evaluating the advantages and disadvantages of both the principles and assessing their implications on clinical laboratory instruments
3. Establishing and following a maintenance program for both types of spectrometers
4. Explaining the theory underlying molecular fluorescence
5. Formulating examples of fluorescence and polarization applications used in the clinical laboratory

**Learning Outcomes:**

- Communicate effectively using listening, speaking, reading, and writing skills
- Use quantitative analytical skills to evaluate and process numerical data

- Solve problems using critical and creative thinking and scientific reasoning