



### **Course Description**

#### **MLS4910 | Advances in Histotechnology Capstone | 7.00 credits**

This course will support the educational development of the histotechnology students by providing an opportunity for in-depth learning in one of the following domains Cytopreparatory techniques; Digital pathology; Electron microscopy; Micro-wave (MOHS) pathology; Ocular pathology histotechnology techniques; which will result in a scholarly project underlying its relevance in today's advanced pathology laboratories.

### **Course Competencies:**

**Competency 1:** The student will demonstrate an understanding of the principles and theories of advances in the histotechnology laboratory as they pertain Cytopreparatory techniques by:

1. Defining the following terms:
  - a. Diagnostic cytology
  - b. Liquid based cytology
  - c. Cell block
2. Differentiating between gynecologic and non- gynecologic cytology specimens
3. Explaining the use and composition of pre-fixatives and their effect on cellular morphology
4. Listing the acceptable fixatives for use in cytology
5. Summarizing 3 slide smear methods
6. Describing methods to:
  - a. Handle sparsely cellular specimens
  - b. Reduce red blood cells in smears
  - c. Increase cellular adherence to slides
  - d. Remove excess mucus
7. Stating the purpose of the Papanicolaou stain and outline its technique
8. Discussing the issues with cross contamination and techniques that can be used to prevent it

**Competency 2:** The student will demonstrate an understanding of the principles and theories of advances in the histotechnology laboratory as they pertain to digital pathology by:

1. Defining digital pathology Evaluating the benefits of digital pathology as they relate national and international routine histotechnology lab work.
2. Identifying standard equipment used in digital pathology Contrasting digital pathology with routine pathology Appraising the use of digital pathology in future histotechnology laboratories.

**Competency 3:** The student will demonstrate an understanding of the principles, theories, and practical work of Electron microscopy specialty in the histotechnology laboratory by:

1. Defining the following terms:
  - a. Magnification
  - b. Resolution
  - c. Apochromatic
  - d. Achromatic
  - e. Binocular vi. Par-focal
2. Identifying the following equipment:
  - a. Light microscope
  - b. Phase contrast microscope
  - c. Darkfield microscope
  - d. Fluorescence microscope
  - e. Scanning electron microscope
  - f. Transmission electron microscope
3. Explaining the difference in light source between the light microscope and electron microscopes

4. Evaluating the use of the electron microscopy in the histotechnology laboratory as it pertains to certain tissue specimens
5. Comparing fixation for routine histotechnology vs electron microscopy
6. Contrasting the images of the scanning electron microscope vs transmission electron microscope

**Competency 4:** The student will demonstrate an understanding of the principles and theories of advances in the histotechnology laboratory as they pertain to microwave tissue processing by:

1. Evaluating the use of microwave tissue processing in the routine histotechnology laboratory.
2. Discussing the limitations with the use of microwave tissue processing.
3. Comparing and contrasting microwave tissue processing and routine tissue processing
4. Listing the components of the microwave tissue processor.
5. Describing the operation and component parts of the microwave analyzer.
6. Listing the different solutions used in microwave processing.
7. Contrasting the time difference in patient reports between microwave processing and routine tissue processing.

**Learning Outcomes:**

1. Communication
2. Critical Thinking
3. Information Literacy
4. Computer / Technology Usage
5. Ethical Issues
6. Aesthetic / Creative Activities