

**Common Course Outline**  
**HSTO 104**  
**Embedding, Microtomy, and Staining**  
**3 Credits**

**Community College of Baltimore County**

**Description**

**HSTO 104 – Embedding, Microtomy, and Staining** explains the embedding of tissue processed by paraffin, factors in the choice of paraffin, melting points and influence on support. Students review the ultrastructure of the cell and the differences between nuclear and cytoplasmic staining. In addition, topics include theory of staining and impregnation, comparison of natural and synthetic dyes, examine types and uses for hematoxylin and differentiation between progressive, regressive and polychromatic staining. Troubleshooting issues with Hematoxylin and Eosin (H&E) staining and contrast resinous media versus aqueous media will be explored.

**3 Credits**

**Prerequisites:** HSTO 101 and HSTO 102

**Overall Course Objectives**

Upon completion of this course students will be able to:

1. state the purpose of embedding specimens;
2. define paraffin in terms of function, advantages, and disadvantages;
3. outline the quality control of paraffin processing;
4. compare and contrast water-soluble waxes, celloidin, plastics, 30% sucrose, agar and gelatin;
5. outline the operation and components of an embedding unit;
6. state the importance of specimen orientation, alignment, multiple pieces, inking, and tissue carryover;
7. analyze troubleshooting problems with embedding;
8. explain the different types microtomes and their purpose;
9. describe the microtomy of different tissue types;
10. summarize the different types of microtome blades and their uses;
11. review troubleshooting problems with microtomy;
12. state the purpose, maintenance, and troubleshooting of a cryostat;
13. explain the ultrastructure of a cell;
14. distinguish the differences in nuclear and cytoplasmic staining;
15. outline the theory of staining and impregnation;
16. differentiate the various types of hematoxylin and their uses;
17. compare and contrast progressive versus regressive staining, natural and synthetic dyes, and polychromatic staining;

18. analyze troubleshooting problems with H&E staining; and
19. contrast resinous media versus aqueous media.

### **Major Topics**

- I. Purpose of embedding
- II. Paraffin
- III. Other embedding medium
- IV. Embedding station
- V. Specimen orientation
- VI. Troubleshooting microtomy problems
- VII. Microtomes
- VIII. Cryostats
- IX. Ultrastructure of a cell
- X. Nuclear and cytoplasmic staining
- XI. Hematoxylin
- XII. Progressive vs regressive staining
- XIII. Polychromatic staining
- XIV. Troubleshooting H&E staining
- XV. Resinous media vs aqueous media

### **Course Requirements**

Grading procedures will be determined by the individual faculty member but will include the following:

### **Grading/exams**

- Weekly quizzes and assignments
- A minimum of three (3) exams
- A cumulative final examination

Written Assignments: Students are required to use appropriate academic resources.

### **Other Course Information**

This course is a Histology program core course.

This course is part of a program sequence, which requires admission to the program.

This course is offered in the Fall only.