Course Number and Title: HTT 211 Histotechnology Procedures I

Campus Location:
Wilmington

Effective Date:
2018-51

Prerequisite:
HTT 100, MAT 153, CHM 110

Co-Requisites:
None

Course Credits and Hours:
3.00 credits
2.00 lecture hours/week
4.00 lab hours/week

Course Description:
This course introduces equipment and basic procedures used in the histology laboratory. Theories and procedures for fixation, processing, embedding, and microtomy are followed by laboratory experience.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
Allied Health/Science Department Program Student Policy Manual

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Demonstrate and discuss safety procedures in the histology lab that include the use of safety equipment and proper handling of solutions and reagents. (CCC 6; PGC 6, 7, 8, 12)
2. Develop a histology lab equipment list and demonstrate functions, component parts, maintenance, and quality control principles and procedures. (CCC 1; PGC 5, 6, 7)
3. Explain and demonstrate tissue preparation from accessioning to embedding. (CCC 1, 2, 6; PGC 1, 2, 5, 6, 7, 8).
4. Prepare acceptable paraffin and frozen sections. (CCC 4; PGC 2, 3, 5, 6, 7, 8)
5. Explain and demonstrate the factors affecting hematoxylin and eosin (H&E) staining. (CCC 1, 6; PGC 2, 4, 5, 6, 7, 8)
6. Given assigned tissue, prepare and assess acceptable slides starting with gross tissue, fixation, processing, embedding, sectioning, and staining. (CCC 2, 3, 4; PGC 2, 4, 5, 6, 7, 8)
7. Demonstrate professional ethics. (CCC 1, 3, 4; PGC 9, 10, 12)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Demonstrate and discuss safety procedures in the histology lab that include the use of safety equipment and proper handling of solutions and reagents.
    1. Examine the necessity of personal protective equipment in the lab.
    2. Locate and describe proper usage of fire extinguishers, eye-wash stations, and safety showers in the histology lab.
    3. Locate and identify the fire exit nearest to the histology lab.
    4. Demonstrate safety measures.
    5. Identify reagents and solutions that are stored at temperatures below room temperature.
    6. Discuss the importance of proper handling and disposal of laboratory solutions and reagents.
    7. Demonstrate proper methods of labeling, storing, and disposing of laboratory solutions and reagents.
    8. Prepare solutions using molar, percent, and dilution equations.
2. Develop a histology lab equipment list and demonstrate functions, component parts, maintenance, and quality control principles and procedures.
    1. Identify and collect operating temperatures of equipment requiring temperature regulation.
    2. Explain the importance of daily quality control and maintenance of equipment.
    3. Identify the component parts and state the function and proper care of various histology lab instruments.
    4. Compare and contrast variations in histology lab equipment.
    5. Construct daily temperature and maintenance charts for histology lab equipment.
    6. Demonstrate daily quality control documentation and record-keeping.
    7. Demonstrate the proper use of a compound microscope.
3. Explain and demonstrate tissue preparation from accessioning to embedding.
    1. Identify how a specimen is identified throughout the histology laboratory process.
    2. Identify and summarize chemical and physical factors affecting tissue fixation.
    3. Describe the technical implications resulting from tissue that is improperly fixed.
    4. Identify fixation artifacts microscopically, and explain how each may be prevented.
    5. Calculate the volume of formaldehyde in a 10% formalin solution.
    6. Identify the chemical compositions of various fixatives.
    7. Compare and contrast various clearing and dehydrating agents.
    8. Assess the relative advantages and disadvantages of the use of universal solvents versus conventional processing methods.
    9. Identify and explain decalcification methods.
    10. Identify and explain the steps of tissue processing.
    11. Design and revise processing schedules in accordance with time and tissue constraints.
    12. Set up and operate the tissue processor.
    13. Given processing problem situations, distinguish trouble-shooting strategies for problem resolutions.
    14. Demonstrate proper embedding techniques.
    15. Explain the relationship between embedding and microtomy.
    16. Compare and contrast various embedding compounds.
4. Prepare acceptable paraffin and frozen sections.
    1. Demonstrate proper use and care of the microtome.
    2. Use proper microtomy techniques to maintain quality and efficiency of paraffin sectioning.
    3. Identify the circumstances under which frozen sectioning is indicated.
    4. Describe the procedures for receiving and performing frozen sectioning.
    5. Demonstrate proper use and maintenance of the tissue cryostat.
    6. Perform frozen sectioning on various types of tissue.
5. Explain and demonstrate the factors affecting hematoxylin and eosin (H&E) staining.
    1. Prepare, operate, and monitor the automated H&E stainer.
    2. Perform hand coverslipping, and use different coverslipping media.
    3. Demonstrate manual H&E staining for paraffin and frozen section slides.
    4. Demonstrate and compare progressive and regressive staining techniques.
    5. Discuss various methods of differentiation.
    6. Relate solution pH to staining results.
    7. Define terminology associated with H&E staining.
    8. Explain the steps of nuclear and cytoplasmic staining.
6. Given assigned tissue, prepare and assess acceptable slides starting with gross tissue, fixation, processing, embedding, sectioning, and staining.
    1. Prepare at least five acceptable slides from each paraffin block.
    2. Demonstrate proper histotechnological technique for each step of tissue preparation necessary to achieve acceptable results.
    3. Assess prepared slides, analyze, and examine problem areas, and formulate resolutions for problems.
7. Demonstrate professional ethics.
    1. Demonstrate professional ethics.
    2. Demonstrate punctuality and attendance.
    3. Express the value of a professional appearance and neatness.
    4. Use constructive feedback to improve professional ethics.
    5. Demonstrate problem-solving ability, time-management, and organizational skills in responding to laboratory pressures and stress.

Evaluation Criteria/Policies:
Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	–	100	=	A
83	–	91	=	B
75	–	82	=	C
0	–	74	=	F

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:
Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Lecture Exams: 4 exams are weighted at 10% each	40%
Final Exam: 1 exam weighted at 20%	20%
Microtomy Slide Practical	20%
Histology Procedure/Task Laboratory Competency	10%
Generic Abilities-Affective Objectives Assessment	10%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Receive and accession tissue specimens accurately.
2. Prepare tissue specimens for microscopic examinations, including all routine procedures.
3. Assist with frozen section procedures in histopathology.
4. Identify tissue structures and their staining characteristics.
5. Perform preventive and corrective maintenance of equipment and instruments or refer to appropriate sources for repairs.
6. Explain factors that affect procedures and results, and take appropriate action within predetermined limits when corrections are indicated.
7. Perform and monitor quality control within predetermined limits.
8. Apply principles of safety to all clinical laboratory procedures.
9. Demonstrate professional conduct and interpersonal communications skills with patients, the public, laboratory and other healthcare personnel.
10. Describe the responsibilities of other laboratory and healthcare personnel and interact with them with respect for their jobs and patient care.
11. Explain and act upon individual needs for continuing education as a function of growth and maintenance of professional competence.
12. Exercise principles of management, safety, and supervision within the clinical laboratory environment.

Disabilities Support Statement:
The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.