Course Number and Title: HTT 212 Histotechnology Procedures II

Campus Location:
Wilmington

Effective Date:
2018-51

Prerequisite:
HTT 211

Co-Requisites:
None

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

Course Description:
A continuation of Histotechnology Procedures I, this course focuses on advanced techniques and special procedures. Topics include cytology preparation, and students are introduced to cytogenetics, muscle enzyme histochemistry, immunohistochemistry, and molecular histology. Emphasis is on tissue preparation, staining technology, quality control, and troubleshooting for these advanced techniques.

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. Distinguish the basic principles, and perform cytology technique procedures for a histologist. (CCC 1, 2; PGC 1, 2, 4, 6, 7)
2. Explain enzyme histochemistry theory, and demonstrate histochemistry techniques. (CCC 1, 2, 6; PGC 2, 4, 5, 6, 7)
3. Explain immunohistochemistry theory. (CCC 1, 2; PGC 2, 3, 4, 6, 7)
4. Demonstrate immunohistochemistry procedures. (CCC 1, 2; PGC 2, 4, 6, 7)
5. Explain molecular histology, and compare and contrast basic laser capture microdissection (LCM) and tissue microarray (TMA) procedures. (CCC 1, 2; PGC 2, 4, 6, 7)
6. 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. Distinguish the basic principles, and perform cytology technique procedures for a histologist.
    1. Demonstrate methods for obtaining samples, preparation of smears, fluids, and washing for exfoliative cytology.
    2. Discuss methods for handling samples with excessive blood or mucous and concentrating cells.
    3. Outline staining techniques for exfoliative cytology and cytogenetics.
    4. Identify basic cell types, and describe normal karyotype preparation.
    5. Describe the sources of error and means for quality control.
    6. Perform special techniques for exfoliative cytology in accordance with written methods, and obtain acceptable results.
2. Explain enzyme histochemistry theory, and demonstrate histochemistry techniques.
    1. Describe and identify skeletal muscle, fiber types, and staining patterns in muscle histochemistry.
    2. List the basic histochemical methods for enzymatic muscle staining.
    3. Identify an artifact from true staining in histochemical staining procedures.
    4. Outline the basic procedures for preparing muscle for histochemical, electromagnetic (EM), and biochemical analysis.
    5. Explain the method used to obtain muscle histograms.
    6. Perform all phases of muscle enzyme histochemistry procedures, and obtain acceptable results.
        1. Operate and monitor a cryostat and pH meter.
        2. Prepare solutions and follow written protocols for histochemistry and immunohistochemistry.
        3. Evaluate, interpret, and review histological staining results.
3. Explain immunohistochemistry theory.
    1. Define and explain immunohistochemistry terminology.
    2. List and describe the different methods for immunohistochemistry.
    3. Identify the difference in detection methods used for immunohistochemistry.
    4. Select appropriate controls for immunohistochemistry.
    5. Determine antibody titers.
4. Demonstrate immunohistochemistry procedures.
    1. Apply methods for enzyme-induced epitope retrieval in immunohistochemistry.
    2. Apply methods for heat-induced epitope retrieval in immunohistochemistry.
    3. Show alternate methods for pre-treating, blocking, and un-masking tissue for immunohistochemistry.
    4. Demonstrate fluorescent and peroxidase methods including direct, indirect, and 3-step methods for immunohistochemistry and the use of control.
    5. Determine and apply enhancement methods for immunohistochemistry.
    6. Perform immunohistochemistry procedures by fluorescent and peroxidase methodologies, and create acceptable results.
        1. Process, embed, cut, and stain paraffin and frozen sections.
        2. Select and prepare appropriate secondary/link antibodies for immunohistochemistry.
    7. Perform special techniques for immunohistochemistry procedures.
        1. Select and use methods for enzyme-induced epitope retrieval and heat-induced epitope retrieval.
        2. Troubleshoot weak or background staining.
5. Explain molecular histology, and compare and contrast basic laser capture microdissection (LCM) and tissue microarray (TMA) procedures.
    1. Using molecular terminology compare in situ hybridization methodology to immunohistochemistry procedures.
    2. Describe probe-labeling methods for in situ hybridization.
    3. Select appropriate controls for in situ hybridization.
    4. Describe the technique for laser microdissection.
    5. Describe uses and procedures for TMA procedures.
6. Demonstrate professional ethics.
    1. Demonstrate professional ethics.
    2. Demonstrate punctuality in assignments and attendance.
    3. Practice appropriate interpersonal skills.
    4. Follow all College and clinical site policies.
    5. Follow all universal and safety policies.

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.

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.