Course Number and Title: EXS 205 Fitness for Special Populations

Campus Location:
Wilmington

Effective Date:
2020-51

Prerequisite:
BIO 121, EXS 135

Co-Requisites:
None

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

Course Description:
This course presents the pathophysiological basis of disease of various body systems. Appropriate exercise prescription and precautions for special populations are considered.

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:
Exercise Science Program Manual
Allied Health/Science Department Policy Manual

Schedule Type:
Classroom Course
Hybrid Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Explain the fundamental principles of pathology and how they relate to exercise prescription and screening. (CCC 2, 4, 6; PGC 1, 2)
2. Describe and categorize various forms of viral, bacterial, integumentary, genetic, neoplastic, and autoimmune diseases and their implications for exercise screening and prescription. (CCC 2, 4, 5, 6; PGC 1, 2, 3)
3. Describe and categorize various forms of cardiovascular disorders and their implications for exercise screening and prescription. (CCC 2, 4, 5, 6; PGC 1, 2, 3)
4. Describe and categorize various forms of excretory disorders and their implications for exercise screening and prescription. (CCC 2, 4, 5, 6; PGC 1, 2, 3)
5. Describe and categorize various forms of digestive, nutritional, and endocrine disorders and their implications for exercise screening and prescription. (CCC 2, 3, 4, 6; PGC 1, 2, 3)
6. Describe and categorize various forms of respiratory disorders and their implications for exercise screening and prescription. (CCC 2, 4, 5, 6; PGC 1, 2, 3)
7. Describe and categorize various forms of nervous, skeletal, and muscular system disorders and their implications for exercise screening and prescription. (CCC 2, 4, 5, 6; PGC 1, 2, 3)
8. Compare the influence of gender, age, and pregnancy on exercise screening and prescription. (CCC 6; PGC 1, 2, 3)
9. Explain the indications and contraindications of various medications for exercise. (CCC 6; PGC 1, 2, 3)
10. Demonstrate and describe various protocols used in clinical settings to evaluate fitness performance. (CCC 1, 2, 6; PGC 2, 3, 4, 5, 6, 7, 9)
11. Identify and demonstrate the components of professional behaviors in the classroom, lab activities, clinical, and field experiences. (CCC 3, 4; PGC 1, 5, 8)

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. Explain the fundamental principles of pathology and how they relate to exercise prescription and screening.
1. Describe the behavioral approaches to assessing stages of change for physical activity and strategies to promote physical activity.
2. Discuss and define the terms associated with pathology.
3. Describe the benefits of physical activity to health and fitness.
4. Identify the factors that cause disease, and give examples of each.
5. Describe pharmacotherapy, including knowledge of the major types of medications used for various diseases and how they affect the body.
6. Explain graded exercise testing, the purposes of administering it, and the various types.
7. Describe absolute and relative contraindications to exercise testing.
8. Explain the concept of exercise prescription for clients with diseases.
9. Explain the concept of exercise prescription for children, pregnant women, and the aging population.
10. Discuss why it is important for an exercise specialist to have a knowledge of pathology.
11. Explain detraining and deconditioning.

2. Describe and categorize various forms of viral, bacterial, integumentary, genetic, neoplastic, and autoimmune diseases and their implications for exercise screening and prescription.
   1. Discuss the events following injury.
   2. Differentiate between inflammation and infection.
   3. List four signs and symptoms of inflammation and the causes of each.
   4. Name the types, structural features, origin, and properties of leukocytes.
   5. Describe the events that occur upon blood vessel damage.
   6. Describe the humoral response.
   7. Describe autoimmunity, immunodeficiency diseases, and acquired immunodeficiency syndrome (AIDS).
   8. Describe growth disturbances associated with each of the characteristic cell types.
   9. List and describe the causes of neoplasms.
10. Describe the immune system in relation to cancer.
11. Describe the role that exercise plays in the immune system functioning.
12. Explain exercise testing, exercise considerations, and exercise prescription for cancer clients.

3. Describe and categorize various forms of cardiovascular disorders and their implications for exercise screening and prescription.
   1. Explain how the cardiovascular and lymphatic systems together form the circulatory system.
   2. Discuss the functions of blood.
   3. Explain the causes and symptoms of anemia.
   4. Discuss the causes, diagnosis, and treatment of polycythemia (erythrocytosis).
   5. Discuss various bleeding (hemorrhagic) diseases.
   6. Discuss diseases of white blood cell forming tissue (e.g., leukemia, lymphomas, etc.).
   7. Explain the structure and function of cardiovascular vessels.
   8. Describe arteriosclerosis and atherosclerosis.
   9. Describe the pathology, causes, and treatment of aneurysms.
10. Describe peripheral vascular diseases of veins and their implications to exercise science.
11. Describe peripheral vascular diseases of arteries and their implications to exercise science.
12. Explain the causes, stages, effects, and treatment of hypertension.
13. List the special considerations needed when testing and prescribing exercise for hypertensive individuals.
14. Describe exercise testing and exercise prescription for peripheral vascular disease and hypertension.
15. Recall the structure and circulation of the heart.
16. Describe an electrocardiogram (EKG), and relate it to events occurring in the heart.
17. Identify abnormal heart action.
18. Describe cardiac circulation.
19. Discuss the causes, prevention, and therapy of coronary heart disease.
20. Describe cardiovascular adjustments to exercise.
21. Describe the relationship among ischemia, angina, and infarctions.
22. Describe how coronary heart disease (CHD) can lead to low functional capacity and therefore influence exercise tolerance, prescription, and testing.
23. List the special considerations needed when testing and prescribing exercise for individuals with CHD.
24. List the special considerations needed when testing and prescribing exercise for individuals after coronary artery bypass surgery.
25. Discuss left-to-right shunt congenital heart diseases and the special considerations needed when testing and prescribing exercise for heart murmurs, atrial septal defect, ventricular septal defect, and patent ductus arteriosis.
26. Discuss obstructive congenital heart diseases and the special considerations needed when testing and prescribing exercise for pulmonary stenosis, aortic stenosis, coarctation of the aorta, and Tetralogy of Fallot.
27. Describe special considerations given to exercise testing of children with disorders of cardiac rhythms.
28. Describe each of the following valvular diseases: mitral stenosis, aortic stenosis, mitral regurgitation, mitral valve prolapse, and aortic regurgitation.
29. Describe the hemodynamic changes that are common to all valvular diseases.
30. Describe the considerations necessary when testing and prescribing exercise programs for clients with valvular disease.
31. Describe the considerations necessary when testing and prescribing exercise programs for clients whom have had valve surgery.

4. Describe and categorize various forms of excretory disorders and their implications for exercise screening and prescription.
   1. Recall the anatomy and function of the kidneys.
   2. Describe the causes, effects, symptoms, prognosis, and treatment of renal failure.
   3. Explain the considerations necessary when testing and prescribing exercise programs for clients with end stage renal disease.
   4. Describe the diseases of the urinary bladder and the urethra.
5. Describe the diagnostic tests of urinary function.
6. Describe and categorize various forms of digestive, nutritional, and endocrine disorders and their implications for exercise screening and prescription.
   1. List the organs of the gastrointestinal (GI) tract and the accessory organs associated with each.
   2. List and describe the most frequent complications of the digestive system.
   3. Describe the major manifestations of disorders of the GI tract.
   4. Explain the causes, symptoms, and treatment of each of the following specific diseases: peptic ulcer, Crohn's disease, pyloric stenosis, and malabsorption syndrome.
   5. List and describe the causes of nutritional diseases.
   6. Describe the following eating disorders: anorexia nervosa, bulimia, and obesity.
   7. Explain obesity with regards to its description, classification, prevalence, mortality, and associated conditions and risks.
   8. Describe the benefits of regular exercise and weight loss on the cardiovascular system, respiratory system, and metabolism for obese individuals.
   9. Describe liver structure and function.
   10. Describe the causes and symptoms of each of the following liver diseases: jaundice; viral hepatitis A, B, C, D, and E; and cirrhosis.
   11. Describe the causes, symptoms, and treatment of cholecystitis and gallstones.
   12. Describe pancreatic function and the diseases associated with it.
   13. Identify and describe the types of diabetes.
   14. Explain the pathophysiological changes that result from diabetes.
   15. Describe the mechanisms of blood glucose monitoring.
   16. Describe the considerations required when prescribing exercise or testing for diabetics.
7. Describe and categorize various forms of respiratory disorders and their implications for exercise screening and prescription.
   1. Define respiration.
   2. Describe the structure and function of the respiratory system.
   3. Explain the most frequent and serious problems of the respiratory system.
   4. Describe the procedures for detecting and diagnosing lung disease.
   5. Discuss the general characteristics of obstructive lung diseases.
   6. Describe the following types of obstructive lung diseases: chronic obstructive pulmonary disease (COPD), chronic obstructive lung disease (COLD), chronic bronchitis, emphysema, and asthma.
   7. Describe exercise prescription concerns when working with obstructive lung disease patients.
   8. Describe the general characteristics of restrictive lung diseases.
   9. Discuss the following types of restrictive lung diseases: pneumonia, tuberculosis, and histoplasmosis.
   10. Describe exercise prescription concerns when working with restrictive lung disease patients.
   11. Describe asthma.
   12. Describe exercise prescription and testing considerations when working with asthmatic patients.
8. Compare the influence of gender, age, and pregnancy on exercise screening and prescription.
   1. Compare the aerobic and anaerobic responses to exercise in children and adults.
   2. Compare the cardiopulmonary responses to exercise in children and adults.
   4. Describe methodological considerations when testing children.
   5. Describe the causes of hyperventilation in special population children and the implications of these on exercise prescription.
   6. Identify common diseases of the elderly.
   7. Describe methodological considerations when testing the elderly.
   8. List the special considerations needed when prescribing exercise for the elderly.
   9. Describe the anatomical and physical changes associated with pregnancy.
   10. Discuss the maternal adaptations to acute and chronic exercise.
   11. Discuss the fetal responses to acute exercise.
   12. Describe the absolute and relative contraindications for exercise in pregnancy.
13. Describe the considerations required when prescribing exercise or testing for pregnant individuals.
14. Discuss post-natal conditioning.

9. Explain the indications and contraindications of various medications for exercise.
   1. Identify the indications and contraindications on exercise prescription and testing for individuals taking medications for the following diseases: cardiovascular disease, respiratory disease, and diabetes.
   2. Identify the indications and contraindications on exercise prescription and testing for individuals taking medications for the following diseases: anti-anxiety, anti-depressants, anti-psychotics, anti-epileptic, non-steroidal anti-inflammatory drugs (NSAIDs), glucocorticoids, calcium channel-blocking agents, angiotensin-converting enzyme inhibitors, beta-blockers, nitrates, dyslipidemia medications, and bronchodilators.

10. Demonstrate and describe various protocols used in clinical settings to evaluate fitness performance.
    1. Develop exercise programs for various special populations incorporating screening techniques, exercise prescription, progress reports, and prescription adjustments to the appropriate levels.
    2. Describe the testing considerations when dealing with various special populations.
    3. Demonstrate and perform flexibility, strength training, and cardiovascular techniques appropriate for various special populations.

11. Identify and demonstrate the components of professional behaviors as applied in the classroom, lab activities, clinical, and field experiences.
    1. Perform a self-assessment on each behavior of the professional behaviors tool at least one time during this course.
    2. Demonstrate the professional behaviors and attributes of the professional behaviors tool.
       1. Professionalism and responsibility
       2. Interpersonal skills and communication skills
       3. Nonverbal communication
       4. Commitment to learning and effective use of time and resources
       5. Use of constructive feedback
       6. Problem-solving and critical thinking
       7. Stress management

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

<table>
<thead>
<tr>
<th>Evaluation Measure</th>
<th>Percentage of final grade</th>
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<tbody>
<tr>
<td>Unit Exams (4) equally weighted (summative)</td>
<td>60%</td>
</tr>
<tr>
<td>Research Project (summative)</td>
<td>18%</td>
</tr>
<tr>
<td>Professional Behaviors (formative)</td>
<td>2%</td>
</tr>
<tr>
<td>Laboratory Competency (1) (summative)</td>
<td>16%</td>
</tr>
<tr>
<td>Case Studies (4) (formative)</td>
<td>4%</td>
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<tr>
<td>TOTAL</td>
<td>100%</td>
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Core Curriculum Competencies (CCC 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. Integrate professional behaviors in an ethical, legal, safe, and effective manner within the exercise science delivery system.
2. Perform appropriate measurement and assessment techniques to assist in evaluating a client’s status for proper exercise prescription plans.
3. Prescribe and implement a comprehensive exercise prescription plan based upon pre-exercise screenings.
4. Communicate effectively with clients about their progress.
5. Modify existing exercise prescription plans based upon routinely scheduled re-evaluations of clients.
7. Demonstrate effective written, oral, and nonverbal communication skills with clients, their families, colleagues, health care providers, and the public.
8. Communicate knowledge by participating in the teaching and explaining of exercise science concepts to clients, colleagues and the public.
9. Recognize the importance of continued development of knowledge and skills through the practice of reading professional literature and attending continuing education activities.
10. Demonstrate the ability to apply their knowledge to aspects of clinical practice, as required of an entry-level Certified Exercise Science technologist.

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.