



## Course Number and Title: EXS 105 Conditioning and Strength Training

**Campus Location:**

Wilmington

**Effective Date:**

2020-51

**Prerequisite:**

EXS 100, EXS 101, SSC 100 or concurrent

**Co-Requisites:**

None

**Course Credits and Hours:**

4.00 credits

3.00 lecture hours/week

2.00 lab hours/week

**Course Description:**

Conditioning and strength training presents a thorough review of skeletomuscular anatomy, physiology, and kinesiology along with basic principles of aerobic conditioning, strength training, flexibility, and stretching.

**Required Text(s):**

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](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

**Disclaimer:**

None

**Core Course Performance Objectives (CCPOs):**

1. Categorize the various factors that influence performance and health. (CCC 2, 5, 6; PGC 2, 7)
2. Distinguish the anatomic descriptors used for regions of the body, directional terms, planes, and axes. (CCC 2, 6; PGC 2, 3)
3. Compare and demonstrate various field tests to evaluate strength and flexibility. (CCC 6; PGC 1, 3, 7)
4. Develop strength and flexibility training programs based upon biomechanical principles for each major muscle group. (CCC 2, 6; PGC 2, 3, 5)
5. Develop and modify effective strength training programs that are consistent with specific client goals. (CCC 3; PGC 2, 3, 5)
6. Discuss the care and operation of a strength training facility. (CCC 3; PGC 1, 7)
7. Administer and appraise various protocols used in clinical settings to evaluate fitness performance. (CCC 2, 6; PGC 2, 3, 4, 5, 6, 7, 9)
8. Compare and demonstrate the components of professional behaviors as applied in the classroom and lab activities. (CCC 3, 4; PGC 1, 5)

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. Categorize the various factors that influence performance and health.
  1. Describe the minimal essential strain [MES].
  2. Describe the effects of physical activity on bone.
  3. Describe stress fractures.
  4. Describe muscle growth when using strength, size, and endurance training.
  5. Describe the effects of physical activity on connective tissues.
  6. Describe how anxiety, arousal, and attention influence athletic performance.
  7. Describe the ideal performance state.
  8. Discuss how various forms of motivation influence athletic performance.
  9. Describe mental management of psychological processes.
  10. Differentiate among the claims, facts, and risks of several ergogenic aids, including anabolic steroids and creatine phosphate .

11. Explain the influence of dietary supplements on athletic performance.
12. Describe how metabolism of various food types influences exercise.
13. Discuss the basic principles that should be followed when prescribing training programs for weight gain and weight loss.
2. Distinguish the anatomic descriptors used for regions of the body, directional terms, planes, and axes.
  1. Demonstrate the various joint movements of the body.
  2. Define *proximal attachment* (PA) and *distal attachment* (DA).
  3. Describe the subcellular structure of skeletal muscle fiber and how it participates in the sliding filament mechanism of contraction.
  4. Illustrate how an action potential propagates down a neuron, crosses synapses, and results in inhibitory post synaptic potential (IPSP), excitatory post synaptic potential (EPSP), or muscle contraction.
  5. Describe various types of muscle actions.
  6. Compare slow twitch and fast twitch fibers.
  7. Describe muscular twitch, tetanus, and recruitment.
  8. Compare muscle spindles and Golgi tendon organ proprioceptors.
  9. Describe neuromuscular adaptations to resistance and endurance training.
10. Identify the major muscles, their proximal attachments, distal attachments, actions, and kinesiology for each of the following body regions:
  1. Head and neck
  2. Back
  3. Chest
  4. Abdomen
  5. Shoulder
  6. Arm
  7. Forearm and hand
  8. Buttocks
  9. Thigh and knee
  10. Leg and foot
3. Compare and perform various field tests to evaluate strength and flexibility.
  1. Describe tests for anaerobic power, agility, and speed, including vertical jump test, one and three minute step tests, and the Wingate anaerobic power test.
  2. Describe the prevention and treatment of low back pain.
  3. Perform the proper procedures for measuring upper body strength and endurance.
  4. Compare the bench press one repetition maximum (1-RM) strength test and multiple repetition maximum.
  5. Describe the purpose and perform the proper procedures for measuring flexibility of the low back and posterior leg muscles (sit and reach test), and shoulders (shoulder rotation test).
  6. Describe modifications of strength assessment and flexibility tests that are used when working with special populations.
  7. Discuss factors which affect flexibility.
  8. Demonstrate active, passive, static, ballistic, dynamic, and proprioceptive neuromuscular facilitation (PNF) stretching exercises.
  9. Identify the muscles involved in stretching exercises for the upper extremity muscles and lower extremity muscles.
  10. Demonstrate stretching exercises for the upper extremity muscles and lower extremity muscles.
  11. Describe the factors involved in developing speed.
  12. Discuss the use of plyometric training for increased athletic performance.
  13. Describe the various aspects involved in designing a plyometric program.
  14. Demonstrate a variety of jump in place, standing jump, hops, bounds, shocks, and upper body plyometric drills.
4. Design strength and flexibility training programs based upon biomechanical principles for each major muscle group.
  1. Demonstrate a pronated, supinated, alternate, and hook grip.
  2. Explain the importance of spotting free-weight exercises.
  3. Describe and demonstrate the proper technique and correct breathing patterns in various strength training exercises for the abdominals, back, biceps, chest, forearms, legs, shoulders and neck, and triceps and name the muscles involved.
  4. Describe the proper technique, and correct breathing patterns in various explosive/power exercises, and name the muscles involved.
  5. Demonstrate the proper techniques for spotting strength training and explosive/power exercises.
5. Develop and modify effective strength training programs that are consistent with specific client goals.
  1. Describe how physiological and biomechanical requirements influence a needs analysis.
  2. Discuss the components of periodization for peak athletic performance.
  3. Compare immediate, short-term, and long-term metabolic training parameters.
  4. Explain how muscle balance, equipment, training background, specificity of training activity, and periodization influence exercise selection.
  5. Describe the importance of muscle balance in developing strength training programs.
  6. Compare exercise prescription used in the preparatory period and competition period.
  7. Compare super setting, compound setting, and pre-exhaustion techniques.
  8. Describe the importance of warm-ups and cool-downs.
  9. Discuss how repetition maximums are used in strength training programs design.
  10. Discuss how training volumes are used in strength training programs design.
  11. Discuss how rest periods influence the results of strength training programs.
  12. Discuss how training frequency influences the results of strength training programs.
  13. Explain Selye's general adaptation syndrome theory.
  14. Define macrocycles, mesocycles, and *microcycles*, and discuss how they are used to develop strength training programs.

15. Discuss the development and implementation of strength training programs for maintenance, rehabilitation, hypertrophy, and strength gains.
6. Discuss the care and operation of a strength training facility.
  1. Describe the National Strength and Condition Association (NSCA) guidelines for designing a safe, efficient strength and conditioning facility.
  2. Explain how program goals and objectives influence policies and procedures for strength and conditioning facilities.
  3. Identify the basic components of facility policies.
  4. Describe the responsibilities of participants in strength and conditioning programs.
  5. Discuss legal issues concerning the care and maintenance of exercise equipment.
  6. Describe environmental factors and the care of floors and walls in a training facility.
  7. Describe the procedures for maintaining aerobic machines, anaerobic machines, free weights, stretching areas, and body weight resistance apparatus.
  8. Identify the components involved in preparing for emergencies in training facilities, including cardiopulmonary resuscitation (CPR), first aid, and other emergency procedures.
7. Administer and appraise various protocols used in clinical settings to evaluate fitness performance.
  1. Administer phosphogenic and anaerobic testing protocols, including vertical jump test, step tests, Wingate cycle ergometer, and one repetition maximum tests.
  2. Demonstrate, analyze, and teach others ballistic, static, and proprioceptive neuromuscular (PN) stretching exercises for all body parts..
  3. Demonstrate, analyze, and teach others plyometric exercises for all body parts.
  4. Demonstrate and teach others through basic and advanced strength training exercises and techniques for all body parts, including bench press, shoulder press, triceps pull down, latissimus pull down, seated row (internal and external rotations), biceps curl, squat, lunge, heel raise, trunk twist, abdominal crunches, and lateral flexion.
  5. Complete an anatomical analysis, including position, movement, cause, and eccentric and concentric muscles involved in basic and advanced strength training exercises and techniques for all body parts, including bench press, shoulder press, triceps pull down, latissimus pull down, seated row (internal and external rotations), biceps curl, squat, lunge, heel raise, trunk twist, abdominal crunches, and lateral flexion.
  6. Demonstrate and teach others through explosive/power exercises.
  7. Demonstrate and teach others through the proper techniques for spotting strength training and explosive/power exercises.
8. Compare and demonstrate the components of professional behaviors as applied in the classroom and lab activities.
  1. Compare the professional behaviors and attributes of the professional behaviors tool.
  2. Complete a self-assessment on each behavior of the professional behaviors tool at least one time during this course.

**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](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
Unit Exams (3) equally weighted (summative)	45%
Project (summative)	22%
Position Paper (summative)	8%
Laboratory Competency (1) (summative)	18%
Professional Behavior Assessment (formative)	5%
Laboratory skill set (1) (formative)	1%
Exercise Technique Assessment (formative)	1%
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. 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.
6. Document relevant aspects of client treatment.
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](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.