George Mason University
College of Education and Human Development
Kinesiology

KINE 360.001 – Strength Training: Concepts & Applications
3 Credits, Fall 2023
M, W 1:30 – 2:45 PM, Katherine Johnson Hall 246

Faculty

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Prerequisites/Corequisites

C or higher in BIOL 124, BIOL 125, ATEP 300, KINE 360.

University Catalog Course Description

Provides students with an opportunity to develop an in-depth understanding of the principles of strength training and conditioning, including: anatomical and physiological considerations, lifting techniques, equipment selection, program development/evaluation, and weightlifting safety; thus enabling them to teach and train clients.

Course Overview

Emphasis will be placed on assessment, description, and analysis of sport movement and designing training programs to enhance performance variables. While this course will assist students, who desire to sit for the National Strength and Conditioning Association's (NSCA) Certified Strength and Conditioning Specialist (CSCS) Exam, it is NOT a preparation course for the NSCA-CSCS exam. Material for the course will be drawn from the required textbook and assigned readings. Class lectures will be presented in PowerPoint with handouts posted on BLACKBOARD in advance of class meetings.

Course Delivery Method

This course will be delivered using lecture and lab format.

Learner Outcomes or Objectives

This course is designed to enable students to do the following:
1. Demonstrate an understanding of the physiological adaptations to resistance training.
2. Explain the role of bioenergetics to metabolic specificity of training.
3. Evaluate and design programs for developing strength, power, speed, and conditioning.
4. Analyze the value of Olympic lifting to athletic performance.
5. Examine the difference between strength training and power training.

Professional Standards

This course meets the Commission on Accreditation of Allied Health Education Programs (CAAHEP) requirements and covers the American College of Sports Medicine's Knowledge-Skills-Abilities (KSA's).

Upon completion of this course, students will have met the following professional standards:

KSA	Description	Lecture, Lab, or both
	DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION: Determine safe and effective exercise programs to achieve desired outcomes and goals and translate assessment results into appropriate exercise prescriptions.	
1.h	Knowledge of the components and sequencing incorporated into an exercise session (e.g., warm-up, stretching, conditioning or sports related exercise, cool-down).	Lab
1.i	Knowledge of the physiological principles related to warm-up and cool-down.	Lab
1.j	Knowledge of the principles of reversibility, progressive overload, individual differences and specificity of training, and how they relate to exercise prescription.	Lecture
1.k	Knowledge the role of aerobic and anaerobic energy systems in the performance of various physical activities.	Lecture
1.m	Knowledge of the psychological and physiological signs and symptoms of overtraining.	Lecture
1.q	Skill in designing safe and effective training programs.	Both

	DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION: Implement exercise prescriptions for flexibility, muscular strength, muscular endurance, balance, agility, and reaction time for apparently healthy clients and those with controlled disease based on current health status, fitness goals and availability of time.	
3.c	Knowledge of safe and effective exercises designed to enhance muscular strength and/or endurance of major muscle groups.	Both
3.k	Knowledge of the anatomy and physiology of skeletal muscle fiber, the characteristics of fast-and slow-twitch muscle fibers, and the sliding filament theory of muscle contraction.	Lecture
3.l	Knowledge of the stretch reflex, proprioceptors, golgi tendon organ (GTO), muscle spindles, and how they relate to flexibility.	Lecture
3.m	Knowledge of muscle-related terminology including atrophy, hyperplasia, hypertrophy.	Lecture
	DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION: Establish exercise progression guidelines for flexibility, muscular strength, muscular endurance, balance, agility, and reaction time for apparently healthy clients and those with controlled disease based on current health status, fitness goals and	
4.a	Knowledge of the basic principles of exercise progression.	Both
	DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION: Prescribe and implement exercise programs for healthy special populations (i.e., older adults, youth, and pregnant women).	
7.e	Knowledge of the benefits and precautions associated with exercise training across the lifespan.	Lecture
7.g	Knowledge of the effects of the aging process on the musculoskeletal and cardiovascular structures and functions during rest, exercise, and recovery.	Lecture
	DOMAIN II: Sport Metabolism	
b.3	Knowledge of energy system employment in response to intensity and duration (i.e., phosphagen system, glycolytic system, aerobic system).	Lecture
b.4	Knowledge of acute and chronic cellular response to intensity and duration (e.g., energy system interaction, consequential byproducts of the energy system, the effect of rest intervals on substrate replenishment and byproduct removal).	Lecture
b.6	Knowledge of physiology of different types of warm-ups, cooldown and recovery methods.	Lab
b.7	Knowledge of acute responses and chronic adaptations to exercise and training (e.g., cardiovascular, metabolic, endocrine, neuromuscular, musculoskeletal)	Lecture

b.8	Knowledge of the force-velocity relationship for adaptational response in sport.	Lecture
b.9	Knowledge of muscle fiber characteristics, recruitment patterns and training adaptations to aerobic and anaerobic training (e.g., structural, neural, metabolic).	Lecture
b.10	Knowledge of the effects of detraining (e.g., structural, neural, metabolic).	Lecture
	DOMAIN V: Advanced Programming for Sport	
e.4	Knowledge of safe and effective exercises designed to reduce the risk of NFO and overtraining.	Lecture
e.5	Knowledge of the anaerobic training methods (e.g., pyramids, eccentric training, supersets, strip-sets, contrast, complex, circuit, interval).	Lecture
e.7	Knowledge of exercises for specific muscular adaptations using open and closed kinetic chains.	Lecture
e.10	Knowledge of spotting techniques and exercise assistance with different training modalities.	Both
e.15	Knowledge of physiological adaptations associated with phasic goals of periodization.	Lecture
e.23	Skill in adjustments for training/recovery (e.g., signs and symptoms of overreaching, overtraining and exercise- induced acute trauma).	Lecture
	DOMAIN VI: Training Techniques for Athletic Performance	
f.1	Knowledge of strategies and instruction techniques for skill/performance, development and enhancement exercises (e.g., power, speed/acceleration, strength, agility, balance, coordination, conditioning).	Both
f.2	Skill in instructing athletes how to use exercise equipment (e.g., free weights, stability equipment aerobic/anaerobic machines for training).	Both
f.3	Skill in instructing and monitoring proper biomechanics of exercise to ensure safety and effectiveness.	Both
f.4	Skill in progressing and regressing exercises safely and effectively based on athlete age and ability.	Both
f.5	Skill in providing exercise modifications for athletes returning from injury.	Lecture
f.7	Skill in instructional strategies for cueing (e.g., form adjustment, spinal position/posture-during lifting and conditioning, proper spotting techniques).	Lab

f.9	Knowledge and skill in techniques for improvements in conditioning, speed, agility and quickness of adolescents.	Lecture
f.10	Skill in teaching and demonstrating appropriate exercises for strength and conditioning in athletic environments.	Both
f.11	Skill in modifying exercises instruction based on age, physical condition, or ability.	Lecture
	DOMAIN VII: Injury Prevention and Return to Play	
g.1	Knowledge of the benefits, risks and modifications of training for injured athletes or those with special conditions/considerations (e.g., age, detrained individual, pregnancy).	Lecture
g.3	Knowledge of the common injuries for each sport and protocols for return to play following medical clearance.	Lecture

Required Texts

Haff G, Triplett T. Essentials of Strength Training and Conditioning. 4th ed. Champaign, IL: Human Kinetics; 2016.

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

Students will be evaluated on content standards (knowledge gained) and performance (demonstration of the content). Content standards will be assessed via quizzes, and exams. Performance will be assessed through completion of labs, homework assignments and group project.

- **Assignments and/or Examinations**

Exams *(Course objectives 1& 2)*

Each student will be required to complete two exams that are non-cumulative. The format for all exams will be multiple choice, and true/false. Examinations represent inquiries regarding student knowledge of fact regarding course content. Examinations demonstrate that the student can remember and apply facts as well as demonstrate a hierarchy of knowledge information.

Reading Comprehension Quizzes *(Course objectives 1, 2, 3, 4, & 5)*

These quizzes will assess your comprehension of the assigned readings. The format of quizzes may be true/false, multiple choice, and/or short answer. *Respondus lockdown browser and webcam will be required for these quizzes.*

Labs *(Course objectives 1, 2, 3, 4, & 5)*

The intent of the laboratories is to provide students the opportunity to gain and demonstrate practical knowledge. Lab activities will require students to work in small groups to complete assigned task. The labs will include several discussion questions. Each group must hand in **1** formal lab report, which will be due in class exactly **1** week after the lab is performed. Lab reports must be typed and include a cover sheet. There will be 4 lab reports in total with each carrying the same weight towards the overall grade. ***A portion of your individual grade will be anonymous ratings of your contributions from the other group members.***

Homework Assignments *(Course objectives 1, 2, 3, 4, & 5)*

The homework assignments will provide an opportunity for students to get an early start on the final project and receive constructive feedback on drafts prior to project due date. ***For homework assignments you will work in small groups and a portion of your individual grade will be anonymous ratings of your contributions from the other group members.***

Final Project *(Course objectives 1, 2, 3, 4, & 5)*

Students will work within assigned groups on a semester long project. Students will employ strategies and skills acquired during the semester to design a periodized training program for assigned sport. The project represents inquiries regarding student's ability to apply knowledge of fact in field settings. ***For your final project you will work in small groups and a portion of your individual grade will be anonymous ratings of your contributions from the other group members.***

Professionalism *(Course objectives 1, 2, 3, 4, & 5)*

Students are expected to behave in a professional manner. Depending on the setting professionalism may look slightly different but generally consists of similar components. For undergraduate Kinesiology students in a classroom setting professionalism generally consists of the following components:

Participation **(75% of Professionalism Grade)** – Show up on time to class meetings. Follow George Mason University policies for any missed classes. Arriving to class late or leaving early will be counted as an absence. Students who know they will need to miss a class for a legitimate

reason should contact the instructor before the class. Students who unexpectedly miss a class for an excused reason should contact the instructor within 24 hours of missing the class. Make-up tests, quizzes, assignments, or other grades will be granted for excused absences only. Excused absences include: serious illness, official university excused absences and extenuating circumstances. It is the student's responsibility to contact the instructor in order to obtain the make-up work. Pay attention, and engage yourself in the lessons, discussions, class activities, etc. Demonstrate that you have an interest in the subject matter. Students are expected to show up prepared to class and participate during class activities.

Communication **(25% of Professionalism Grade)** – When communicating with the instructor and classmates, either face-to-face or via email, students should address the other person appropriately, use appropriate language and maintain a pleasant demeanor.

Example email with instructor:

Dr. Last Name,

I have a question regarding….

Regards,

Student's Name

Example in-person interaction with instructor:

Student: Professor (*instructor's last name*) I have a question regarding….

Professor: (Student's name) I would be happy to help you. What is your question?

Student: My question is…….

Professor: The answer to that question is…

Student: Professor (*instructor's last name)* thank you for your time and availability to answer my questions.

Responsibility/Accountability/ Honesty/Integrity– Professionals take responsibility for their actions and are accountable. This can occur at multiple levels but generally consists of completing assignments on time, submitting work that is of the appropriate quality, honoring commitments and owning up to mistakes. Students are expected to be honest with the instructor, classmates, and themselves. Professionals keep their word when committing to something and act in an ethical manner. See George Mason University policy for further guidance.

Self-Improvement/Self-awareness– One should be aware of their strengths/weaknesses and constantly seek to improve. Professionals regularly seek out opportunities to increase their knowledge and improve their current skill set. Specific to this class an example of how a student

may demonstrate self-improvement/self-awareness is by attending office hours following a poor grade on an exam or assignment.

Professionalism evaluation – *Any professionalism violation will be documented by the instructor. Violations will result in a 1-point deduction from the final average. In extreme cases the student may be dismissed from the class at the discretion of the instructor.*

Extra Credit Opportunities

Students will have the opportunity to author original discussion board post during the semester. In addition, students are expected to respond/comment on posts by colleagues during the semester. Detailed instructions are available on blackboard.

- **Other Requirements**
  - **Email Correspondence**
    - Only messages that originate from a George Mason University email address will be accepted. ***Emails with no subject or no text in the body will not be acknowledged.*** All email will be responded to in the order in which it is received. Students should allow 48 hours for a response.

- **Course Performance Evaluation Weighting**

This course will be graded on a percentage system.

- **Assignments and/or Examinations**

A. Written Examinations

Exam 1	20%
Exam 2	20%
B. Syllabus & Blackboard Reading Comprehension Quizzes (RCQ)	15%
C. Labs	10%
D. Homework Assignment	10%
E. Project	15%
F. Professionalism	10%

Grading Scale

A+ = 95 – 100	B+ = 87 – 89	C+ = 77 – 79	D = 60 – 69
A = 94 – 100	B = 84 – 86	C = 74 – 76	F = 0 – 59
A- = 90 – 93	B- = 80 – 83	C- = 70 – 73	

Final Grades:

Once your FINAL GRADE, at the end of the semester is posted on mymasonportal/blackboard, you will have 24 hours to inquire. After that period, your grade will be posted as final on Patriot Web.

Note:

1) Although a B- is a satisfactory grade for a course, students must maintain a 3.00 average in their degree program and present a 3.00 GPA on the courses listed on the graduation application.

2) Any student asking for their grade to be rounded up, increased a letter grade, extra credit only for themselves at the end of the semester, etc. may have their final average reduced by up to 2 points at the discretion of the instructor.

Professional Dispositions

See https://cehd.gmu.edu/students/polices-procedures/
Students are held to the standards of the George Mason University Honor Code. You are expected to attend all class sections, actively participate in class discussions, complete in-class exercises and fulfill all assignments. Make-up tests, quizzes, assignments, or other grades will be granted for excused absences only. Excused absences include serious illness, official university excused absences and extenuating circumstances. It is the student's responsibility to contact the instructor in order to obtain the make-up work.
No late work will be accepted in this course without a submitted extension request. The extension request must be submitted in place of the assignment, to the course instructor, by the assignment deadline. Extension requests must be submitted with an explanation as to why the student is unable to complete the assignment on time. No extension requests will be granted if submitted after the assignment deadline. Students are allowed one 24-hour extension per course. Extensions approved beyond 24 hours are at the discretion of the instructor. Extensions cannot be requested for exams or presentations.
In dire or extenuating circumstances, students may be allotted additional extensions or make up opportunities at the instructor's discretion.

Any text generated by an artificial intelligence (AI) text-generation tool (such as ChatGPT) is not accepted in this class as "the student's own work," and so will be considered similarly to text published on paper or online or text composed or significantly edited/altered by another person. The use of such text without proper attribution is a violation of academic integrity.

Class Schedule

Date		Topic	Assigned readings	Assignments & Due Dates
Week 1	8/21	Course Introduction		Read syllabus and complete syllabus quiz Due Aug 26
	8/23	Periodization Part I	Read Chapter 21 **(pp 583-584, 587-592)**	Extra credit discussion board post (Due on Saturdays)
Week 2	8/28	Structure of the Body System	Read Chapter 1	**Join a Group** Extra credit discussion board post Chapter 1 RCQ Due 11:59PM, Sep 2nd
	8/30			
Week 3	9/4	Labor Day No class	Read Chapters 2	**Group Sport & Sex** Chapter 2 RCQ Due 11:59PM, Sep 9th
	9/6	Biomechanics		
Week 4	9/11	Biomechanics Warm up and flexibility training	Read Chapters 14	
	9/13	**Lab 1:** Warm-up and Flexibility		**Homework Assignment 1** Extra credit discussion board post Chapter 3 RCQ Due 11:59PM, Sep 16th
Week 5	9/18	Bioenergetics	Read Chapter 3	
	9/20	Bioenergetics & Endocrine Responses	Read Chapter 4	Extra credit discussion board post Chapter 4 RCQ Due 11:59PM, Sep 23rd **Lab 1 Due**
Week 6	9/25	Endocrine Responses		
	9/27	Age and sex related differences	Read Chapter 7	Chapter 7 RCQ Due 11:59PM, Sep 30th

				Extra credit discussion board post
Week 7	10/2	**Lab 2:** Resistance Training	Read Chapters 15	
	10/4	Age and sex related differences & Adaptations to Anaerobic training programs	Read Chapters 5	**Homework Assignment 2** Extra credit discussion board post Chapter 5 RCQ Due 11:59PM, Oct 7th
Week 8	10/10 **Tuesday**	Adaptations to Anaerobic training programs		**Lab 2 Due**
	10/12	Review for Exam #1		
Week 9	10/16	**Exam #1**		Extra credit discussion board post
	10/18	Performance testing	Read Chapters 12 & 13	
Week 10	10/23	**Lab 3:** Performance Assessment		
	10/25	Performance testing		Extra credit discussion board post Chapter 12 & 13 RCQ Due 11:59PM, Oct 28th
Week 11	10/30	Periodization Part II	Read Chapter 21 **(pp 584-586, 593-595)** **(*Review pp 583-584, 587-592*)**	Extra credit discussion board post **Lab 3 Due**
	11/1	Resistance training	Read Chapter 17	**Homework Assignment 3** Chapter 21 RCQ Due 11:59PM, Nov 4th
Week 12	11/6	Resistance training		

	11/8	**Lab 4:** Olympic lifts & Kettlebells		Extra credit discussion board post Chapter 17 RCQ Due 11:59PM, Nov 11th
Week 13	11/13	Rehabilitation and reconditioning	Read Chapter 22	Extra credit discussion board post
	11/15	Plyometric training	Read Chapter 18	**Homework Assignment 4** Extra credit discussion board post Chapter 22 RCQ Due 11:59PM, Nov 18th **Lab 4 Due**
Week 14	11/20	Speed and Agility	Read chapter 19	
	11/22	**Thanksgiving - No Class Meeting on Wednesday**		Chapter 18 & 19 RCQ Due 11:59PM, Nov 25th.
Week 15	11/27 11/29	***Group Presentations***		
Week 16	*Exam Period*	**Exam #2**		**December 6th @ 1:30PM**

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: http://cehd.gmu.edu/values/.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see https://catalog.gmu.edu/policies/honor-code-system/).
- Students must follow the university policy for Responsible Use of Computing (see https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see https://ds.gmu.edu/).
- Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or https://cehd.gmu.edu/aero/tk20. Questions or concerns regarding use of Blackboard should be directed to https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/.
- For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus

Notice of mandatory reporting of sexual assault, sexual harassment, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Non-Confidential Employee," and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website https://cehd.gmu.edu/students/ .