GROVE CITY COLLEGE
Hopeman School of Sciences
Department of Exercise Science
EXER 510 Human Performance and Nutrition

Course Outline & Syllabus

Course Title:	EXER 510 Human Performance and Nutrition, 3 credits
Class Schedule:	Lecture: Tuesday 4:30-7:00 pm
Instructor:	Philip Prins, PhD.
	Office: Physical Learning Center 202
	Phone: 724-458-3863
	Email: prinspj@gcc.edu
Office Hours:	By appointment
Required Texts:	Sports and Exercise Nutrition 5th Ed., by McArdle, Katch and Katch. (2013) published by Lippincott Williams & Wilkins.

D2L/MYGCC Course Management System:
D2L and mygcc will be used in this course to disseminate lecture handouts, assignments, and important announcements.

Course Description
A lecture and laboratory class in which the principles of nutrition are applied to sports performance and exercise. The course will explore the synergy between nutrition and athletic performance according to the latest scientific findings. The course will focus primarily on the nutritional needs of athletes. The major subject areas covered in this course include: evidence-based dietary guidelines and recommendations for health and physical performance, metabolism and bioenergetics, energy release and substrate utilization, energy metabolism during exercise, fluid intake and athletic performance, nutrition for training and competition, sports specific considerations, fitness and nutrition assessment in athletes, implications of carbohydrate, protein, and fat on health and physical performance, safety and efficacy of low and high carbohydrate diets, ergogenic aids and dietary supplements and impact of macronutrient composition on body composition and weight control.

Teaching approaches for the course include lectures, assigned readings, in-class discussions, and problem-based learning through written assignments/case studies (both in-class and homework).

Student Learning Objectives: By completion of this course, students will be able to:
1. Conduct nutritional assessments for active individuals.
2. Understand energy metabolism and fuel usage for active individuals.
3. Identify macronutrient and fluid recommendations for active individuals.
4. Identify and understand the interrelationships between nutrient intake and exercise performance.
5. Understand how to evaluate research articles to gain a strong foundation for sports nutrition and supplementation.
6. Identify and understand the effects of exercise and training on nutrient requirements.

Kinesiology Master Program Objectives and Student Learning Outcomes

Students will have the ability to:

Upon completion of the program, the student will:

1. **Critically appraise research, generate meaningful research questions and projects, and implement research-driven ideas into practice.**
2. **Demonstrate an understanding of the current issues and trends, and advanced concepts and theories in exercise science?**
3. **Gain advanced laboratory skills and knowledge of Human Performance Laboratory instrumentation.**
4. **Understand the mechanistic connections between nutrition and metabolism and human performance, health and disease.**
5. **Possess a comprehensive understanding of the biological contributions of physical activity and sedentarism.**
6. **Implement and interpret testing strategies to assess various components of movement competency, performance, and recovery.**
7. **Gain practical experience teaching and coaching advanced exercises.**
8. **Understand the biological effects of a variety of stresses on the human body and how we might leverage some stresses to improve health and performance.**
9. **Develop an understanding of initiation and termination of human movement and factors that affect optimal movement.**
10. **Complete a directed research project or internship.**

Learning Outcomes	Assessment	Department Objective
1. Conduct nutritional assessments for active individuals.	Case Study Project	1, 4
2. Understand energy metabolism and fuel usage for active individuals	Exam	2, 4
3. Identify macronutrient and fluid recommendations for active individuals.	Exam	2, 4
4. Identify and understand the interrelationships between nutrient intake and exercise performance.	Exam Presentation	2, 4
5. Understand how to evaluate research articles to gain a strong foundation for sports nutrition and supplementation.	Presentation	1, 4

6. Identify and understand the effects of exercise and training on nutrient requirements.	Exam Presentation	2, 4

Evaluation

Student evaluation will be based on his/her performance on the assignments/case studies, presentations, exams, class participation, and attendance. Calculation of the final grade:

ASSIGNMENT	POINTS
Case Study Paper	50
True/False Presentation	50
Midterm Exam	50
Final Exam	100
Attendance/participation	50
Total	300

ASSIGNMENTS

Case Study: See attached assignment sheet.

True/False: Each student will sign up for one T/F statement to present during one of the classes. The presentation should be no longer than 20 minutes. Read the T/F statement to the class and explain your position (either T or F) thoroughly. The presentation should include: physiological and/or metabolic rationale, scientific literature in support of your position and a reference list. PowerPoint should be used to present your topic. Submit the PowerPoint slides by noon on the day of the presentation. Submit via TEAMS.

Final Exam Policy:

As stated in the Bulletin, final exams must be administered according to the time scheduled by the Registrar's office, and cannot be changed to suit the convenience of the student. It is your responsibility to schedule your travel and work plans accordingly. Students with a GCC excused absence will receive permission to reschedule their final exams. In addition, any student who has three exams scheduled on a given day may request permission from the Dean of the school of the student's first major to reschedule one exam; however, the Dean is not required to grant such a request.

Accessibility & Accommodations:

It is Grove City College's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on a disability, please let me know immediately so that we may discuss options. You are also welcome to contact the disability services office to begin this conversation or to establish accommodations. The Disability Services Coordinator may be reached at 724-264-4673 or DisabilityServices@gcc.edu<mailto:DisabilityServices@gcc.edu>.

Grading Scale:

The following grading scale will be used for this class:

90 – 100	A
80 – 89	B
70 – 79	C
< 70	F

The catalog describes each of the grades as follows:

The 'A' grade may be interpreted to mean that the instructor recognized exceptional capacities and exceptional performance.
The grade of 'B' signifies that the student has, for any combination of reasons, demonstrated a significantly more effective command of the material than is generally expected in the course.
The 'C' grade is the instructor's certification that the student has demonstrated the required mastery of the material.
The 'F' grade indicates failure to master the essentials and the necessity for repeating before credit may be allowed.

Nutrition & Performance Course Outline - Readings & Assignments

Week	Lecture Topic	Readings & Assignments
1	Introduction Nutrition for Exercise and Health	Magkos, F and Yannakoulia, M. (2003) Methodology *of dietary assessment in athletes: concepts and pitfalls*. Curr Opin Clin Nutr Metab Care 6:539-549.
2	Metabolism & Fuel Usage During Exercise	Ch 4 & 5 Brooks, George A., and Mercier J. (1994) *Balance of carbohydrate and lipid utilization during exercise: the "crossover" concept*. J. App. Physio. 76(6): 2253-2261 Noakes, T. D., Prins, P. J., Volek, J. S., D'Agostino, D. P., & Koutnik, A. P. (2023). *Low carbohydrate high fat ketogenic diets on the exercise crossover point and glucose homeostasis.* Frontiers in Physiology, 14, 1150265.
3	Carbohydrates and Exercise	Ch 1, 2, & 3 American Dietetic Association Position Stand

		2009 *Nutrition and Athletic Performance* Burke, LM. (2011). *Carbohydrates for training and competition.* J Sports Sciences 29(S1):17-27. *Coleman, E. (2011). Carbohydrate Requirements for Exercise.* Nutrition Dimension
4	Protein and Exercise	Ch 1, 2, & 3 Phillips, SM et al. (2012). *Dietary protein requirements and adaptive advantages in athletes*. Brit J Nutrition 108:S158-S167.
5	Fat and Exercise	Ch 1, 2, & 3 Lowery, LM (2004). *Dietary fat and sports nutrition: A primer*. J Sports Science and Med 3 :106-117. Gonzalez, JT (2013). New perspectives on nutritional interventions to augment lipid utilization during exercise. Brit J Nutr 107 :339-349. Prins, P., Noakes, T., Buxton, J., Welton, G., Raabe, A., Scott, K., & Abraham, J. (2023). *High fat diet improves metabolic flexibility during progressive exercise to exhaustion (VO 2 max testing) and during 5km running time trials.* Biology of Sport, 40(2). Prins, P. J., Noakes, T. D., Welton, G. L., Haley, S. J., Esbenshade, N. J., Atwell, A. D., ... & Ault, D. L. (2019). *High rates of fat oxidation induced by a low-carbohydrate, high-fat diet, do not impair 5-km running performance in competitive recreational athletes*. Journal of Sports Science & Medicine, 18(4), 738. Prins, P. J., Noakes, T. D., Buga, A., D'Agostino, D. P., Volek, J. S., Buxton, J. D., ... & Koutnik, A. P. (2023). *Low and high carbohydrate isocaloric diets on performance, fat oxidation, glucose and cardiometabolic health in middle age males*. Frontiers in Nutrition, 10, 1084021.

6	*Guest Speaker Dr. Tim Noakes Carbohydrates or Fats for Exercise Performance*	Noakes, T. D. (2022). *What is the evidence that dietary macronutrient composition influences exercise performance? A narrative review.* Nutrients, 14(4), 862.
7	**NO CLASS SPRING BREAK**	
8	**Midterm Exam**	
9	Fluid and Electrolyte Balance	Ch 10 ACSM Position Stand: *Exercise and Fluid Replacement* Med Sci Exer Sport Feb 1, 2007 Shirreffs, SM (2011). *Fluid and electrolyte needs for training, competiton and recovery*. J Sports Sciences 29(S1):39-46.
10	Body Composition	Ch 13 Ackland, TR et al. (2012) *Current status of body composition assessment in sport*. Sports Med 42(3):227-249.
11	Achieving a Healthy Body Weight & Energy Balance	Ch 14 Loucks, AB. *Energy availability in athletes*. J Sports Sci, 2011;29(S1):S7-S15. Loucks, AB. *Energy balance and body composition in sports and exercise*. J Sports Sci, 2004;22:1-14.
12	Ergogenic Substances and Supplements for Sport Performance	Ch 11 & 12 Peeling, P., Binnie, M. J., Goods, P. S., Sim, M., & Burke, L. M. (2018). *Evidence-based supplements for the enhancement of athletic performance*. International journal of sport nutrition and exercise metabolism, 28(2), 178-187. Martínez-Sanz, J. M., Sospedra, I., Mañas Ortiz,

		C., Baladía, E., Gil-Izquierdo, A., & Ortiz-Moncada, R. (2017). *Intended or unintended doping? A review of the presence of doping substances in dietary supplements used in sports*. Nutrients, 9(10), 1093.
13	*Guest Speaker* *Dr. Jeff Volek* *Nutrition for Optimizing Athletic Performance*	Volek, J. S., Freidenreich, D. J., Saenz, C., Kunces, L. J., Creighton, B. C., Bartley, J. M., ... & Phinney, S. D. (2016). *Metabolic characteristics of keto-adapted ultra-endurance runners*. Metabolism, 65(3), 100-110.
14	Presentations	NA
15	Presentations	NA ***WRITTEN CASE STUDY DUE***
16	**Final Exam**	

EXERCISE SCIENCE DEPARTMENT PROCEDURES FOR CLASS ATTENDANCE

Attendance

Each student may elect to take three unexcused cuts (per semester) before it will affect their grade. Each cut beyond the allotted three will lower the grade one letter. If all of the student's cuts are excused and are six or more in number, the grade shall be an incomplete (I).

Provost's Excuse

Absences incurred through participation in authorized College activities are excused by the Provost and count as an excused cut. The faculty supervisor of each organization, or coach of each sports team, will provide the Office of the Provost with names of students whose participation causes them to miss classes. Students should inform the instructor of his/her absence before and after the missed classes. It is the responsibility of the student to make-up any missed work.

Absences incurred due to legitimate illnesses or to death in the immediate family

In case of a death in the family, students are excused provided written verification is received from the Student Affairs Office. In case of illness, the student should have been to Zerbe Health Center or his/her own personal physician for medical attention. In either of these circumstances, the student must make up the work

missed for the class, and provide written verification of their condition to the instructor at the next class they attend.

Student suspension

Students not permitted to remain on campus and attend classes due to disciplinary suspension sanctioned by the Office of Student Life and Learning will be permitted to make up classes missed during the time of suspension. For attendance purposes only, students may attend additional classes, assigned by the instructor, during the first week of attendance on campus after the suspension period. Make-ups for any written work, including quizzes or exams, missed during the suspension period will not be permitted.

HONESTY IN LEARNING

Students are expected to adhere to the "Honesty in Learning" policy as outlined in the Bulletin and Crimson. Violations will be dealt with as outlined therein.

Cheating and Plagiarism may be present in many areas, including (but not limited to) the following:

1. Doing Papers, Outside Work. Work done out of class, which a student submits as his/her own work to a professor, should be his/her own and should not contain that which has been obtained from another, other than properly credited references, sources, and citations.
2. Taking Exams, Tests, Quizzes. Work done on a test, exam, or quiz, which a student submits to a professor, should be his/her own and should not contain that which has been knowingly obtained from another. By default, no resources are permitted unless explicitly allowed by the instructor.
3. Preparing for Exams. A student should not seek to gain an advantage on an exam he/she is about to take by obtaining advanced access to particular questions or advance copies of a professor's exam, or by giving access to other students. This includes access to exams from prior semesters.
4. Group Work. In courses where group work or teamwork is allowed, the members of the group may collaborate and share resources among themselves, but not with other groups or prior and subsequent classes.
5. A student should not cooperate with, aid, or encourage another student’s violation of the above rules, even though he or she receives no direct benefit. Any student who does so is also guilty of cheating, and can have their grade from current or past semesters (if relevant) reduced.
6. Instructor-Imposed Limitations. Faculty may add (via syllabus, assignment instructions, or verbal instructions) additional rules and limitations pertaining to cheating in their particular discipline, class, and assignment.

PLAGIARISM

Plagiarism is a serious violation of moral and academic principles. It involves claiming as one's own original work the ideas, phrasing, or creative work of another person. As such, plagiarism is a direct violation of the biblical commandments against stealing, bearing false witness, and covetousness; thus, the Grove City College policy. We encourage our students to think seriously about the demands of their Christian faith in regards to this issue.

We remind students that plagiarism includes the following:

1. Any direct quotation of another's words, from simple phrasing to longer passages, without using quotation marks and properly citing the source of those words.
2. Any summary or paraphrase of another's ideas without properly citing the source of those ideas.
3. Any information that is not common knowledge—including facts, statistics, graphics, drawings—without proper citation of sources.
4. Any cutting and pasting of verbal or graphic materials from another source and representing as one's own work—including books, databases, web sites, journals, newspapers, etc.—without the proper citation for each of the sources of those materials; this includes any copyrighted artwork, graphics, or photography downloaded from the Internet without proper citation.
5. Any wholesale "borrowing," theft, or purchasing of another's work and presenting it as one's own, whether from the Internet or from another source.
6. Any presentation of "ghost-written" work including—whether paid for or not—as one's own original work, including papers, computer code, visual artwork, and other forms of written and non-written work.
7. Making one's work available for copying by others, as well as copying work posted on the Internet or otherwise made available by another.
8. Self-citation: you cannot submit the same work for two different classes. If you use part of an earlier work, or ideas from an earlier work, you should reference it, as with any other source.

Application to this course - Discussion with other students of class material and of background material relevant to homework assignments is encouraged. Each homework assignment submitted should represent only your work, however. You may collaborate with other students only while conceptualizing the problem and while outlining the solution strategy. You should not copy homework solutions from other students.

****Any use of ChatGPT or other AI tool to generate content for an assignment, while crediting the output as your own work, constitutes an act of plagiarism and a violation of the college's academic integrity policy****

CLASSROOM COMPUTER POLICY

Students are welcome to use their computers for note-taking or other class-relevant activities. The manner in which you use your computer in class is considered a matter of honor and professionalism. Students are to adhere to the following guidelines:

- The student computer should NOT be connected to the network (wireless or hardwire) unless instructor-initiated classroom activities require the network.
- Computer use must be for note-taking or other class-relevant activities.
- Use of the computer must be subtle and non-distracting to classmates and the instructor. *Other uses (such as those described below) constitute a significant visual distraction for others seated nearby who have paid for the right to be free of these unnecessary intrusions.*

Inappropriate use of a computer in the classroom may be viewed as being disrespectful to the instructor, is often distracting to other students, and is unprofessional. Examples (not a comprehensive list) of inappropriate activities include:

- E-mailing
- Instant Messaging
- Surfing the Web
- Working on projects/assignments for other classes (or the current class unless directed to do so by the instructor)
- Playing games
- Watching movies
- Listening to music

Judgment as to the appropriateness of student computer use is at the discretion of the instructor. The consequences for violating this policy are also at the discretion of the instructor.

- **First offense:** you will be asked to turn off your computer for the remainder of class.
- **Second offense:** you will be asked to leave class immediately.
- **Third offense:** you will be asked to leave class immediately and attend class for the remainder of the semester without your computer, and therefore take notes with pen and paper only.

General Class Absence Policy:

It is the student's responsibility to notify the instructor of the class before the absence (except for emergency situations) and make up any course work missed.

Most Grove City College courses are designed for in-person learning and it is not the instructor's responsibility to provide course work in an on-line modality for students who are unable to attend.

1. Students who experience a medical condition or other unanticipated event that requires them to be absent from their courses should contact the Registrar's Office and SLL about securing an approved excuse. The Registrar's Office will contact the dean and faculty members about a short-term plan to help the student continue in the class (See #4 below).
2. Students with approved excuses can only miss class for a maximum of two consecutive weeks. After that they must withdraw from the course for the semester. Faculty should not grant students incompletes and set expectations that students can complete missed activities in any timeframe outside of the current semester (one exception would be if the approved request falls inside the last two weeks of the semester).
3. Faculty will work with the student to make up missed content, but this short-term solution does not mean that the course will be delivered in an online modality.
4. Faculty should specify which of the follow ways he/she will provide students with course content when the extended absence is approved by the Registrar's Office. Faculty should check at least one box below:
    - Record lectures on LMS/Teams
    - livestream the class on LMS/Teams
    - Help student get copies of lecture notes from a classmate
    - Outline what the student needs to do to keep up with readings, homework, written assignments, etc. (Specify what the student must do)
    - Provide student with a copy of the PowerPoint presentations when appropriate
    - Provide student with a copy of the professor's lecture notes
5. Faculty may decide to pro-rate the grades from missed lab grades, quizzes, exams, and other assignments during the excused absence. If the faculty elect to pro-rate grades from missed assignments, he/she should communicate this decision to the student in an email.