



KINE 340: Nutrition for Physical Activity & Health

Term: Fall 2026

Credits: 3.0

Lecture Times & Location: Tuesday & Thursday 1:00–2:15 p.m., Lovell Hall 110

Modality: In-Person

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Instructor Information

- **Instructor:** Dr. Elena Pereira (Assistant Professor of Nutrition)
- **Email:** epereira@university.alkimi.ai
- **Office:** Calder Health Sciences Building 324
- **Office Hours:**
 - Monday & Thursday: 11:30 a.m.–1:00 p.m. (In person, Calder Health Sciences Building 324)
 - Friday: 9:00–10:00 a.m. (Virtual via Zoom; link posted in Canvas)
 - Also available by appointment.

Course Description

Macronutrient and micronutrient metabolism, energy balance, hydration, dietary supplements, and nutrition strategies for exercise, sport, and chronic disease prevention. KINE 340 examines the foundational biochemistry of nutrient metabolism and its practical application to physical activity, athletic performance, and long-term health. Students explore the digestion, absorption, and cellular utilization of carbohydrates, proteins, and lipids, alongside fluid balance, electrolyte dynamics, and vitamin/mineral function. Integrating guidelines from the American College of Sports Medicine (ACSM) and the International Society of Sports Nutrition (ISSN), the course prepares students to evaluate dietary supplements, calculate energy balance, and design evidence-based nutritional strategies for active individuals and chronic disease prevention.

Prerequisites

CHEM 101.

Measurable Student Learning Outcomes

Upon successful completion of KINE 340, students will be able to:

1. **Analyze Macronutrient and Micronutrient Metabolism:** Examine the digestion, metabolic pathways, and biochemical roles of carbohydrates, lipids, proteins, vitamins, and minerals during resting and exercising states.
2. **Calculate Energy Expenditure and Balance:** Quantify total daily energy expenditure, basal metabolic rate, and thermic effect of food using empirical equations and dietary analysis tracking software.
3. **Formulate Hydration and Fueling Strategies:** Design individualized pre-, during-, and post-exercise hydration, carbohydrate loading, and protein intake protocols aligned with ACSM and ISSN consensus statements.

4. **Critically Appraise Dietary Supplements and Ergogenic Aids:** Evaluate the efficacy, physiological mechanisms, safety profiles, and regulatory status of popular sports supplements and ergogenic substances.
5. **Design Nutrition Plans for Health and Disease Prevention:** Develop targeted nutritional interventions addressing metabolic syndrome, cardiovascular disease, osteopenia, and the female and male athlete triads.

Required Course Materials & Approximate Costs

1. **Fink, Heather Hedrick, and Alan E. Mikesky. *Practical Applications in Sports Nutrition*. 6th ed., Jones & Bartlett Learning, 2021.** Approx. \$90 print, \$55 digital rental.
2. **Dunford, Marie, and J. Andrew Doyle. *Nutrition for Sport and Exercise*. 5th ed., Cengage Learning, 2022.** Approx. \$80 print or digital.
3. **Total estimated cost:** \$85 to \$130.

Generative AI Policy (AI Level 2: AI Permitted with Disclosure for Specified Tasks)

In accordance with Alkimi University Academic Policies (Student Handbook §5.8), KINE 340 operates under **AI Level 2**.

- **What is permitted:** You may use generative AI tools to assist in brainstorming nutrient-dense recipe modifications, checking arithmetic on dietary macronutrient calculations, and proofreading the written discussion of your personal dietary analysis project.
- **What is prohibited:** You may not use generative AI to generate dietary intake records, formulate clinical nutrition recommendations, write case analysis submissions, or complete examination questions. Submitting automated dietary assessments without personal data collection is prohibited.
- **Disclosure:** Each major project must include an AI disclosure statement detailing any tools used, queries submitted, and how AI responses were integrated or revised. If no AI tools were used, state: 'No generative AI tools were used in preparing this work.'

Grading Components and Weights

- **Examination 1:** 15% (In class, Thursday, October 1)
- **Examination 2:** 15% (In class, Thursday, November 12)
- **Three-Day Dietary Assessment & Energy Balance Project:** 20% (Due Friday, October 23 at 11:59 p.m.)
- **Athlete Fueling Strategy Case Analysis:** 15% (Due Friday, November 20 at 11:59 p.m.)
- **Weekly Canvas Quizzes & Nutrition Calculations:** 15% (Due Mondays at 11:59 p.m. in Canvas; lowest quiz score dropped)
- **Final Examination:** 20% (Monday, December 14, 2026, 1:00–3:00 p.m.)

Grading Scale (Alkimi University Standard)

- **A:** 93–100% | **A-:** 90–92%
- **B+:** 87–89% | **B:** 83–86% | **B-:** 80–82%
- **C+:** 77–79% | **C:** 73–76% | **C-:** 70–72%
- **D+:** 67–69% | **D:** 60–66% | **F:** Below 60%
- **Extra credit:** No individual extra credit assignments are offered in KINE 340.

Course Schedule (Fall 2026)

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 1	Aug 27	Introduction to Sports Nutrition and Dietary Guidelines: Overview of sports nutrition, Dietary Reference Intakes (DRIs),	<i>First day of classes: Wed Aug 26.</i>

Week	Dates	Topics & Readings	Assignments & Deadlines
		Dietary Guidelines for Americans, and nutrient density. <i>Reading: Fink & Mikesky, Ch. 1</i>	
Week 2	Sep 1, 3	Nutrient Digestion, Absorption, and Bioenergetics: Gastrointestinal tract anatomy, enzymatic breakdown of foodstuffs, nutrient transport, and cellular energy production. <i>Reading: Fink & Mikesky, Ch. 2</i>	<i>Wed Sep 2: Add/section change deadline.</i>
Week 3	Sep 8, 10	Carbohydrates: The Primary Fuel for Exercise: Simple versus complex carbohydrates, glycogen storage dynamics, glycemic index, and endurance fueling demands. <i>Reading: Fink & Mikesky, Ch. 3</i>	<i>Mon Sep 7: Labor Day (no classes). Wed Sep 9: Census date (last day to drop without a W).</i>
Week 4	Sep 15, 17	Carbohydrate Loading and In-Competition Strategies: Exogenous carbohydrate intake rates during endurance exercise, multiple transportable carbohydrates, and post-exercise glycogen resynthesis. <i>Reading: Fink & Mikesky, Ch. 3</i>	—
Week 5	Sep 22, 24	Proteins: Muscle Synthesis and Repair: Amino acid kinetics, complete and incomplete proteins, timing of protein intake, and leucine trigger in muscle protein synthesis. <i>Reading: Fink & Mikesky, Ch. 4</i>	—
Week 6	Sep 29, Oct 1	Lipids: Essential Fats and Endurance Energy: Fatty acid classification, lipid metabolism during submaximal exercise, intramuscular triglycerides; Examination 1 in class. <i>Reading: Fink & Mikesky, Ch. 5</i>	Examination 1 (in class).
Week 7	Oct 6, 8	Vitamins: Coenzymes in Metabolism and Antioxidant Defense: Water-soluble and fat-soluble vitamins, energy-producing B-complex vitamins, antioxidant mechanisms, and deficiency states. <i>Reading: Fink & Mikesky, Ch. 6</i>	—
Week 8	Oct 15	Minerals: Electrolytes, Oxygen Transport, and Bone Health: Iron metabolism and sports anemia, calcium balance, zinc, magnesium, and bone mineral density in athletes. <i>Reading: Fink & Mikesky, Ch. 7</i>	<i>Oct 12–Oct 13: Fall break (no classes).</i>
Week 9	Oct 20, 22	Water, Electrolytes, and Thermoregulation: Sweat rate determination, dehydration consequences, hyponatremia prevention, and fluid replacement guidelines during training. <i>Reading: Fink & Mikesky, Ch. 8</i>	Three-Day Dietary Assessment & Energy Balance Project due Fri Oct 23 at 11:59 p.m.
Week 10	Oct 27, 29	Nutritional Ergogenic Aids and Dietary Supplements: Evidence-based ergogenic aids (creatine, caffeine, beta-alanine, sodium bicarbonate), third-party testing, and contamination risks. <i>Reading: Fink & Mikesky, Ch. 9</i>	—
Week 11	Nov 3, 5	Weight Management and Body Composition Modification: Energy availability, safe caloric deficits for fat loss, periodized hypertrophy fueling, and metabolic adaptation to dieting. <i>Reading: Fink & Mikesky, Ch. 10</i>	<i>Fri Nov 6: Last day to withdraw (W) or elect Pass/No Pass.</i>
Week 12	Nov 10, 12	Relative Energy Deficiency in Sport (REDs): Clinical consequences of low energy availability, hormonal disruptions, bone health impairments; Examination 2 in class. <i>Reading: Fink & Mikesky, Ch. 11</i>	Examination 2 (in class).
Week 13	Nov 17, 19	Nutrition for Specific Sports and Athlete Profiles: Nutritional periodization for endurance runners, strength-power athletes, team sports, and aesthetic disciplines. <i>Reading: Fink & Mikesky, Ch. 12</i>	Athlete Fueling Strategy Case Analysis due Fri Nov 20 at 11:59 p.m.
Week 14	Nov 24	Nutrition and Chronic Disease Prevention: Dietary strategies for reducing atherosclerosis, hypertension, insulin resistance, type 2 diabetes, and systemic inflammation. <i>Reading: Dunford & Doyle, Ch. 14</i>	<i>Nov 25–Nov 27: Thanksgiving break (no classes).</i>
Week 15	Dec 1, 3	Special Populations: Lifespan and Dietary Restrictions: Nutritional needs of vegetarian and vegan athletes, adolescent	—

Week	Dates	Topics & Readings	Assignments & Deadlines
		competitors, master athletes, and pregnant individuals. <i>Reading: Dunford & Doyle, Ch. 15</i>	
Week 16	Dec 8	Course Synthesis and Professional Dietetics Practice: Scope of practice boundaries between registered dietitians and personal trainers/kinesiologists; final exam review. <i>Reading: Course review packet</i>	<i>Wed Dec 9: Last day of classes. Thu Dec 10: Reading Day.</i>
Finals	Dec 14	Final Examination: Monday, December 14, 2026, 1:00–3:00 p.m., Lovell Hall 110.	Comprehensive examination covering macronutrients, micronutrients, hydration, supplementation, and disease prevention.

Course Policies

Attendance Policy

Regular class attendance and engagement in case problem-solving are expected. Discussions in class explore clinical controversies, nutrient timing calculations, and dietary case evaluations that cannot be replicated independently. If you miss class due to illness or an excused university event, please contact Dr. Pereira as soon as possible. Students who miss the first two class meetings without notifying the instructor may be dropped. Students may miss class for religious observance without penalty if they notify the instructor in writing within the first two weeks of the semester (by Wednesday, September 9, 2026). Absences for university-sponsored activities (athletics, performances, conferences) are excused with a letter from the sponsoring office at least one week in advance.

Late Work Policy

Late project submissions will incur a deduction of 10% per calendar day up to a maximum of three days. Submissions after 72 hours will receive no credit unless a medical or family emergency is verified through Academic Advising. Quizzes close on Canvas at the stated time and cannot be submitted late.

Scope of Practice and Ethics

Students will learn the legal and professional boundaries distinguishing registered dietitians (RD/RDN) from certified strength coaches and personal trainers. Prescribing medical nutrition therapy without licensure is illegal and violates professional standards of conduct.

Final Exam Policy

The final examination (Monday, December 14, 2026, 1:00–3:00 p.m.) is scheduled by the University Registrar and can't be moved without the Dean's written approval (Faculty Handbook §5.5). A student with three or more final exams on the same calendar day may reschedule one of them. Requests go to the instructor of the middle exam by the last day of classes. For this term, send the request by Wednesday, December 9, 2026 (Student Handbook §6.4).

Academic Integrity

Alkimi University is an academic community devoted to rigorous scholarship, open intellectual inquiry, and uncompromising ethical conduct. All students are subject to the regulations of the Alkimi University Academic Integrity Policy. Academic dishonesty—including plagiarism, cheating on examinations, unauthorized collaboration, fabrication of empirical data, and unauthorized submission of academic work generated by artificial intelligence—undermines the integrity of the university and carries severe disciplinary sanctions. Sanctions range from a failing grade on an assignment or exam to an administrative course failure recorded as an 'XF' on the official transcript, academic suspension, or expulsion. Suspected violations are formally investigated and resolved through the Office of Academic Integrity in accordance with Faculty Handbook §6. For detailed information, consult the Office of Academic Integrity, Lovell Hall 315, (555) 555-0163, integrity@university.alkimi.ai.

Accessibility Services

Alkimi University is committed to providing equitable educational access and reasonable accommodations for all students with documented disabilities, including physical, sensory, psychological, learning, and chronic health conditions. Students requesting academic accommodations must formally register with the Office of Accessibility Services, Harlan Hall 204, (555) 555-0155, access@university.alkimi.ai. Once approved, students will receive an official Faculty Accommodation Letter detailing approved accommodations. Students should present this letter to the instructor as early in the semester as possible, and at least one week prior to any exam or assignment requiring accommodation. Accommodations cannot be applied retroactively.

Student Wellness and Mental Health

Your physical health, psychological well-being, and mental health are essential to your academic success. If you experience heightened stress, anxiety, depressive symptoms, personal trauma, or academic burnout, free, confidential counseling and medical care are available through the Hollis Health & Counseling Center, located in the Hollis Center. Routine appointments are available Monday–Friday 8:00 a.m.–6:00 p.m. and Saturday 10:00 a.m.–2:00 p.m. during the semester by calling (555) 555-0190 or emailing health@university.alkimi.ai. Urgent, 24/7 crisis psychological counseling is accessible immediately at (555) 555-0199.

Campus Student Support Services

- **Academic Advising Center:** Lovell Hall 101 | (555) 555-0158 | advising@university.alkimi.ai
- **Writing Center:** Whitcombe Library 3rd Floor | Free consultations on papers, reports, and research projects at any stage.
- **Whitcombe Library:** Whitcombe Library, Main Floor | (555) 555-0170 | askalibrarian@university.alkimi.ai
- **Hollis Health & Counseling Center:** Hollis Center | (555) 555-0190 | 24/7 Counseling Line: (555) 555-0199 | health@university.alkimi.ai
- **Nutrition Science Consultation Hours:** Calder Health Sciences Building 324 | Office consultations on dietary software tracking and nutrient calculation protocols with Dr. Pereira.