



**MSE 1050 The Science Behind
Sports Gear**
Spring Semester 2025
Department of Materials Science and Engineering

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**Teaching
Assistant:**
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Pre-requisites: N/A
Lecture: Tu/Th 12:25-1:45, GC 2675
Credit Hours: 3

Text(s): No text required

Course Description: Discover the secrets of your favorite sports gear! In MSE 1050, "The Science Behind Sports Gear," you'll explore how materials science enhances athletic performance. From carbon fiber bikes to high-tech running shoes, learn about the atomic structures, mechanical properties, and innovative materials that make sports equipment safer and more effective. This engaging course combines case studies, hands-on experiments, and interactive lectures, making it perfect for students of all backgrounds. Join us to see how science and sports intersect, and gain a unique perspective on the materials that athletes rely on every day. We will cover key physics and materials concepts of gear for climbing, cycling, skiing, snowboarding, running, swimming, and many others.

Course Outcomes: This course carries the Physical Science Exploration (PS) designation. This course addresses the General Education Learning Outcome: Collaborate Effectively

- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies
- An ability to communicate technical information effectively in oral and written form
- An understanding of materials structure and properties that affect the materials application in sports gear

Content Overview: Physical Science:
Atomic structure/bonding/molecules; Mechanical properties; Materials failure; Phase behavior; Interfacial properties; Polymers; Composites; Thermal properties, etc.

Sports Gear:
Climbing, Cycling, Skiing & Snow Boarding, Skating, Running, Baseball, Basketball, Volleyball, Swimming, Tennis, etc.

Grading & Evaluation Methods: Home work (20%)
Midterm exams, Quizzes (40%)
Group project (20%)
Final Exam (20%)

Key Dates: TBD

The Americans with Disabilities Act. The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

University Safety Statement. The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

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