



Massachusetts Institute of Technology

UNDERGRADUATE SEMINARS

SPRING 2021

ESG sponsors a series of innovative and interactive seminars on topics not commonly found elsewhere at MIT. Seminars are pass/fail and open to all MIT undergraduates. For additional information visit the ESG site (esg.mit.edu) or e-mail esglizards@mit.edu.

ES.010 Chemistry of Sports: Understanding How Exercise Affects Your Body

The purpose of this seminar is to study the chemistry and biology of sport and the effect of exercise and nutrition on athletic performance and physical fitness. We will be able to use our own bodies to measure how exercise affects the body, through observations recorded in a training journal. We will look at nutrition and supplements (both legal and prohibited) to understand their impact on athletic performance; the effect of diet and exercise on anatomic and metabolic systems; the various biochemical reactions triggered by exercise; the role of endorphins, changes in blood chemistry and ways of stimulating long-term changes in your metabolism and even changes to our genetic programming. We will examine our own unique body chemistry and study how genetics, age and body type play a role in these physical and molecular changes that science is only beginning to understand. Finally, we will also examine the chemistry of sports equipment including swimming, cycling, and running equipment and its effect on athletic performance.

The COVID restrictions have changed the way that we work and play. We will approach this seminar as way to educate ourselves in working out in the new normal. We will look at how the sports industry has adapted to COVID and see what lessons we can learn to apply to our own lives. *Instructors: Patti Christie and Steve Lyons; Meets T 3-5pm, 6 units (virtual)*

ES.S92 Authenticity

Explores the question of how to live an authentic life, through works of western and eastern philosophy and contemporary psychology. Topics include emotions, anger, honesty, forgiveness, non-violent communication, conflict resolution, kindness and cruelty and compassion. Taught inside a secure Massachusetts correctional facility with a mix of MIT students and incarcerated students. Limited to 12. *Instructors: Lee Perlman; Meets Tuesdays and Thursdays 10-11:30 am, 6 units (virtual)*

ES.S30 From Transistors to TikTok

Computation and communication: they shape our world as we know it today. But these technologies didn't emerge from thin air—they were born from common human experience, logic, and physics. From basic Python to artificial intelligence, from building a computer to connecting millions of them across the globe: we'll introduce these topics in an accessible way for everyone, regardless of background. By term's end, we'll have explored many of the interesting classes of MIT, but without the pressure of actually being in them—learning for learning's sake. No prereqs, no psets, no pressure! *Instructor: Christian Cardozo; Meets Fridays 3-5 pm, 3 units (virtual)*

ES.S70 The Varieties of Human Experience (with Apologies to William James)

An introduction to the study of life, as lived, focusing on those experiences that make us truly human: creativity and dreaming, altruism and conscience, beauty and love, consciousness and spirituality. We will address these questions in an interdisciplinary way, embracing the fields of genetics, evolution, molecular biology, ethology, paleoanthropology, neurobiology, neurodevelopment, network theory, complexity and systems theory, integrated information theory, and computational neuroscience. In the process, we will become acquainted with the tools of modern neuroscience, as well as the importance of experiments of Nature, and the role of clinical neuroscience and psychiatry. Finally, we will explore how such neurobiological phenomena might be instantiated in computer architectures. *Instructor: Charles Kaufmann; Meets F 3-5 pm, 6 units (virtual)*