

Activity Information

This information will be shared on the MechE Summer X 2020 website

Title: Fashion Engineering: Performance Meets Sustainability

Instructor name: Svetlana V. Boriskina

Instructor email: sborisk@mit.edu

Brief bio of instructor: Dr. Svetlana V. Boriskina is a Research Scientist at the Department of Mechanical Engineering. She develops new materials and technologies to harvest and manipulate light and other forms of radiation for applications in energy, national security, communications, and fashion. Her research in smart meta-materials and award-winning textiles is funded by the US Army, Advanced Functional Fabrics of America (AFFOA), and the MIT Deshpande Center. As the Lead Editor for the Energy and Environmental Optics Express, Svetlana is leading the effort to disseminate the scientific knowledge and address challenges in the water-energy nexus, photonics, metamaterials, and environmental sensing. Visit website for more info: <http://sboriskina.mit.edu>

Description of the activity: Fashion is one of the biggest industries in the world, which is driving innovation in both synthetic and naturally-derived materials, manufacturing, coloring techniques, and manufacturer-consumer interactions. It is also one of the most wasteful, with the textiles manufacturing alone using over 26T gallons of water and 98M tons of oil per year. About 200 liters of water are used to produce 1 kg of textile! This short version of the IAP 2020 course will cover the scientific, engineering and environmental aspects of the textile industry, and requires no prior expertise. Topics to be covered include:

- Ancient and recent history of textile technology and innovations
- Physical properties of fibers & textiles, intro to polymer science
- 'Smart' textiles
- Supply chain and manufacturing models
- Life-cycle assessment and eco-design of textiles and wearables

Every session will start with a fun quiz to preview the new topics and review the material from the previous session. Short YouTube videos will be recommended to watch between sessions followed by discussion. The participants will be offered an opportunity to participate in a challenge activity to design (conceptually) a textile-based wearable accessory that provides functionality and reduces environmental footprint.

Participant preparation: none

Materials, tools, or other requirements: Poll Everywhere free app will be used for quizzes

Specific safety considerations: not applicable.

Enrollment limitations: none

Activity schedule:

Session No.	Topic	Date	Start time	Duration
Session 1	Intro, history, natural v. synthetic, weaving	July 27, 2020	1:00 pm	1:30 h
Session 2	Inventions and supply chains	July 28, 2020	1:00 pm	1:30 h
Session 3	Fashion and environment	July 29, 2020	1:00 pm	1:30 h
Session 4	Smart fibers and textiles, design challenge	July 30, 2020	1:00 pm	1:30 h