



Northeastern University

Global Sustainability

Bio-inspired Design

Ann McDonald, Associate Professor, Department of Art and Design; and Sandra Shefelbine, Professor, Departments of Bioengineering and Mechanical and Industrial Engineering

How can design principles observed in nature, inspire design innovations that increase our well-being and offer sustainable futures? Evolution is the design process in nature; the results are spectacular materials, structures, sensors, and ecologies. We will examine the incredible variety of designs in nature and how we can utilize them in the design process to develop structures, products, services, and environments. Student projects explore how we can use designs from nature to reduce human-created waste, or use nature as inspiration for ways to improve the portability and physical support characteristics of seating to accommodate solo and group seating reconfiguration and reminders of necessary physical distancing.

Urban Infrastructure

Matthew Eckelman, Associate Professor, Civil and Environmental Engineering

The majority of humans live in cities, but how do cities actually work, physically? Why are our cities designed as they are? And how can we implement urban systems that are more sustainable, resilient, and equitable? Properly functioning infrastructure is essential for the function of modern societies, yet there is chronic under-investment, totaling trillions of dollars just for the United States alone. We will explore different types of urban infrastructure – transportation, energy, water, telecommunications, food, and waste management, among others – in terms of basic engineering principles, how advances in infrastructure technology have shaped history, and how the benefits and costs of major infrastructure decisions are distributed. Each student project will critically investigate a local piece of infrastructure of their choice, to explain its design, financing, level of performance, environmental and social impacts, and finally to suggest innovations that could be harnessed to make improvements for their local communities.

Sustainable Fisheries Management

Jonathan Grabowski, Professor, Marine and Environmental Sciences

How can industrial and artisanal fisheries around the world be designed to simultaneously promote food security, the well-being of fishing communities, and the sustainability of coastal marine ecosystems? We review common elements of fisheries that result in them achieving or violating elements of sustainability, from the ecosystem to the communities that sustain their livelihood through fishing. We also examine fishery food supply chains and the practices and policy changes that could be implemented to enhance local and regional food security. For the project, students will pick a fishery and develop a proposal that provides policy recommendations and practices



Northeastern University

aimed at improving the well-being of its fishers, the sustainability of the coastal marine ecosystem that is within, and local and regional food security.

The Global City

Oliver Ayers, Senior Lecturer in History, NCH London; and Lars Kjaer, Lecturer in History, NCH

From the COVID-19 pandemic to renewed calls for racial justice across the world, the events of 2020 have reinforced how cities are crucibles of social transformation - for good and ill. But there is a deeper and conflicted history here: time and again, it has been in cities where empires have risen and fallen, where philosophical ideas have been debated, where laws have been enacted, where political decisions have been made and contested and - crucially - where people have migrated to live, work and forge social relationships. At a time of profound global change when the future of cities and the wider world looks uncertain, how can we make these complex and oftentimes difficult pasts work for us, promoting reconciliation in the present and helping to create inclusive and sustainable futures?