

**COURSE CARDS FOR IN-PERSON ATTENDANCE
WILL NO LONGER BE MAILED.
Course Cards will be held for pick up at the proctors' table.**

D. Big Ideas for a Better World

Faculty from McCormick School of Engineering, Feinberg School of Medicine, and Weinberg College of Arts and Sciences
Thursdays, 1:00 - 2:30 p.m. Norris University Center

Today's extraordinary scientific innovations are advancing at a breathtaking pace. How can a world-class research university harvest its brain trust to improve everyday lives? Drawing upon the expertise of NU's outstanding faculty, this course will explore transformative approaches for tackling critical challenges to our health and environment while advancing basic science. Weekly lecture topics will cover a broad range of consequential issues such as the obesity epidemic, the plastic waste crisis, and global CO₂ emissions. These lectures will provide insights into new horizons for building a better and safer world.

Apr. 3 The Dawn of Bioelectronic Medicine: Electronic Devices that Dissolve in Your Body

John Rogers, *Louis Simpson and Kimberly Querrey*
Professor of Materials Science and Engineering;
Biomedical Engineering and Neurological Surgery

A remarkable feature of modern integrated circuit technology is its ability to operate in a stable fashion, almost indefinitely, without physical or chemical change. Recently developed classes of electronic materials and manufacturing approaches create an opportunity to engineer the opposite outcome, in the form of 'transient' devices that can dissolve to harmless end products after insertion into the body. This talk describes the essential concepts behind this kind of temporary biomedical implant – with examples of its use as a form of bioelectronic 'medicine.'

Apr. 10 Innovations in Water Technologies and Systems

Aaron Packman, *Professor, Civil and Environmental Engineering, Robert R. McCormick School of Engineering and Applied Sciences*

Water systems are critical to society, industry, and health, but current water infrastructure is energy-intensive and discharges large quantities of useful material in wastewater effluent. This lecture will describe new materials and technologies to improve water reuse, resource recovery, and circular economies. At the system level, the talk will present recent advances using municipal wastewater to track public health status, particularly in pandemics and epidemics.

Apr. 17 **What Will It Take To Reach NetZero CO2 Emissions by 2050?**

Ted Sargent, *Lynn Hopton Davis and Greg Davis*
Professor, Chemistry; Co-Director, Paula M. Trienens
Institute for Sustainability and Energy

Professor Sargent will discuss the steps needed – technological and human – in order to reduce our carbon intensity dramatically, from 40 Gton/year today to net zero by 2050. The lecture will include the need to advance and scale the generation of low-carbon-intensity electricity, such as solar, wind, and nuclear; the need to store that energy cost-effectively, such as in next-generation batteries; the need to decarbonize industries such as steel and cement; the need to achieve circularity of polymers/materials, and also of CO₂; and the need to capture carbon energy-efficiently. Additionally, Prof. Sargent will provide an update on how Northwestern University is contributing in these important frontier areas.

Apr. 24 **The U.S. Obesity Epidemic: Are the New Weight-loss Drugs Really a Game-Changing Treatment?**

Robert F. Kushner, M.D., *Professor, Depts. of Medicine*
and Medical Education, Feinberg School of Medicine

GLP-1 medications such as Ozempic and Wegovy have experienced blockbuster success since their entry into the market in 2021, changing the lives of thousands of people living with obesity. What is the science behind GLP-1 and what are its clinical implications? This presentation will review the hype behind this transformative drug, from discovery to its current and future applications.

May 1 **Breaking News in Astronomy**

Michael Smutko, *Professor of Instruction, Physics and*
Astronomy; Director of Dearborn Observatory

This lecture will explore some of the latest developments and advancements in our knowledge of the universe. Ongoing research provides fascinating new insights into black holes, gravity waves, solar activity cycles, cosmology, searching for new planets, and Webb telescope discoveries. What does this mean for our understanding of planet earth and its place in the universe?

May 8 **Decisions, Decisions. . .Assuring the Resilience of
Transportation Infrastructure with Smart
Decision-Making**
Joseph L. Schofer, *Professor Emeritus of Civil and
Environmental Engineering, Robert R. McCormick School of
Engineering and Applied Science*

The lecture will examine decisions about where and how to invest in infrastructure to determine its performance, costs, and its resilience in the face of natural and anthropogenic disruptions. The outcomes affect our transportation experiences and sometimes our lives. In this lecture we'll use real cases to illustrate the use and misuse of information in decisions to invest in, and to protect, critical US transportation assets. We'll use these cases to extract some lessons to guide future decisions.

May 15 **Exploring the Power of Generative AI: What the Future
May Hold**
Kris Hammond, *Bill and Cathy Osborn Professor of
Computer Science*

Artificial intelligence (AI) is reshaping numerous industries, and one of the most impactful developments in this landscape has been the rise of generative AI systems such as ChatGPT. Powered by a unique blend of machine learning and natural language processing capabilities, Generative AI has emerged as a transformative technology that has redefined the realm of human-computer interaction. We will navigate what these systems are and how Generative AI can be deployed, demonstrating its potential across sectors such as education, healthcare, and the law. And we will look at what comes next. What will our world look like as we enter the era of Artificial General Intelligence? What are the ethical considerations in this new world? How do we construct a world that now includes machines that are becoming more intelligent every day?

May 22 **NO CLASS**

May 29 **The Global Plastics Crisis: A New Catalyst Design for Recycling Plastic Waste in a Circular Economy**

Tobin Marks, *Vladimir N. Ipatieff Professor of Catalytic Chemistry and Chemical and Biomedical Engineering; Materials Science and Engineering*

The current increase in plastics production/consumption has generated vast quantities of waste with severe environmental consequence. To counter such scenarios, a circular economy in which waste plastics are recycled and repurposed is urgently needed. This lecture focuses on mechanism and thermodynamics-based strategies to deconstruct/recycle PET and other polyester materials using structurally well-defined earth-abundant molecule-derived catalysts. These catalytic processes are solvent-free and multiply recyclable.

June 5 **Ecology and Evolution of Antimicrobial Resistance**

Erica Hartmann, *Associate Professor, Civil and Environmental Engineering, Robert R. McCormick School of Engineering and Applied Science*

The discovery of penicillin and the antimicrobial drugs that followed revolutionized medicine, dramatically improving our ability to treat bacterial infections. However, antimicrobial resistance, which has developed and spread in the intervening decades, threatens to plunge humanity back to a time when infectious disease was the leading cause of death worldwide. This lecture will cover some of the factors that promote antimicrobial resistance, as well as exciting new strategies to combat infectious disease.