**Bi 270 C**
**SPRING 2016-17**

This class will meet twice a week — once with a lecture and once for discussion. Lectures will cover a full range of challenges facing the world in 2050 and will offer a new way of thinking (based on my upcoming book) that is designed to help us understand these global problems and find new solutions. Each student will also complete a project offering his or her own creative way for addressing some challenges of the modern age.

Lectures will cover the following topics:

1) **Limits to Growth in a Finite World**: This lecture will consider how Malthusian limits may apply to continued growth of the human population and of global economic activity. It will cover ideas of Thomas Malthus (1798) and modern studies from ecology; it will discuss predictions such as those from *The Limits to Growth* (1972) — a study sponsored by the Club of Rome — and other more recent attempts to model the "carrying capacity" of the planet.

2) **Prediction and Planning in a Complex World**: Looking ahead toward the world in 2050 raises important questions about our ability to make accurate predictions: How well have previous predictions — like those discussed in the last lecture — fared when made on a multi-decade time scale? What limits the range and accuracy of such predictions? What role can foresight play in a world that is too complex for us to get all the details right?

3) **Challenges of Global Warming**: This lecture will consider the scientific data about climate change, risks to society, limits to our current political will, prospects for international cooperation, technological advances that are needed, and the expected economic costs of fundamental change.

4) **Environmental Damage and Resource Depletion**: Topics will include an overview of the status of the world's oceans, farmland, fisheries, forests, and fresh water supplies. Recent trend lines – with the bleaching of coral reefs, the loss of topsoil and rain forests – will be used to highlight key risks, and we will review current efforts to address these challenges.

5) **The Global Economic System**: We'll explore ways in which the current economic system depends on assumptions about continued growth and will consider ways in which it may need to be restructured to allow for a sustainable, "steady state" world.

6) **Advances in Science and Technology**: In many ways, the modern world emerges only via the amazing progress of science and technology. But a question remains: Does the increasing size of the world population now expose a more fundamental limit in the carrying capacity of the planet, or will technological advances — once again — allow us to solve these problems and continue with current growth curves?

7) **Artificial Intelligence**: AI already plays an important role in our daily lives, and it has a potential for helping us find new ways to address some of these global challenges, but

it also poses risks. There are threats to privacy, risks of cybercrime and cyberwarfare, threats of widespread unemployment, and risks of severe confusion as the legal system tries to accommodate to the increasing use of "autonomous intelligent agents."

8) **Urbanization**: Given that an ever-increasing portion of the world's population will live in cities, we'll need to ask: To what extent do the challenges of the future come back to the problem of designing "smart cities"? What might these look like? How can we plan and implement and pay for all the changes that are needed?

9) **Governance and World Order in an Age of Complexity**: Government will be analyzed as a kind of "information processing system," considering the problems that democracy has in handling the deep complexity of the modern world, and looking at the potential advantages/disadvantages of the "mixed modes" of authoritarian governance now emerging in Asia. This lecture also will explore questions of world order, considering ways that competition and cooperation may play out in a global community of nations with dwindling resources and an ever-increasing number of nuclear powers.

10) **Life, Hope, and Action in an Age of Uncertainty**: This lecture will offer a provisional synthesis of everything discussed in the course, considering how each individual can best pick a "life path" amidst these challenges, building a satisfying career and raising a family while working to help address these global challenges.

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**Student Projects:** Grades in the course will be assigned on the basis of classroom participation and a research project (or two shorter papers). Projects and papers should focus on the prospects for hope, considering which approaches seem most effective in addressing these challenges of the modern age, and exploring ways that these current efforts might be extended and amplified. What action can you foresee that might help the most? Students can work as a team on a research project as long as all members of a given team have signed up for the course under the same grading plan (i.e. all taking the course for a letter grade or all taking it pass/fail) and as long as each team member submits a one-page summary explaining which aspects of the project they've focused on.

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**Required Reading:** Short review papers will — on occasion — be assigned to accompany individual lectures. Students will read Jorgen Randers' book *2052: A Global Forecast for the Next Forty Years* (Chelsea Green Publishing, 2012).

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**Note:** Although my book will not be published until later in the year, my ideas about "theories of thought," and my strategies for mapping the flow of information – following the way that ideas develop and move from mind to mind – will provide an important

backdrop for this course. Students will be challenged to explore these new modes of thought, new ways of seeing how the flow of ideas 1) describes the flow of physical events in the surrounding world and, yet, how the flow of ideas also 2) proceeds as a set of physical processes in a physical world. Seeing the world in these dual modes helps us develop a “stereoscopic” method of thought, rising above the flatland of any fixed, formal, “scientific” interpretation and seeing the world in fresh ways.