# INTS 4579: International Futures

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Policy analysis, whether on issues of security, development or the

environment, involves decisions about priorities. Decisions require forecasting the trajectory of an issue area with and without interventions of various kinds. This course will involve you in the process of forecasting and analysis.

You will learn to use the International Futures (IFs) forecasting system. That system represents multiple issue areas (agriculture, demographics, education, infrastructure, economics, energy, environment, governance, health, and international politics) and is supported by a very large database. You will study the structure of each of these modules, learn how they represent the underlying sub-systems, how they are linked to other sub-systems, and what they tell us about the processes of change globally and in countries and regions around the world. You will use this system for forecasts and analyses of your own.

This course provides analytical tools from a broad range of disciplines to better understand global change across all of these issue areas. As part of the tool kit you will learn how to bring systems perspectives to the analysis of new fields of study, a near requirement for understanding of complex processes.

As we discuss each issue area or global subsystem, we will tend to use a common framework. That will involve (1) identifying the structural elements in the issue area, both accounting systems and major causal dynamics, (2) reviewing the historical (data-based) development patterns within the issue area/subsystem, (3) discussing the way in which we represent the system in IFs for forecasting, (4) exploring the “base case” dynamics of change within each issue area, globally, by region, and by country (using IFs and other tools), and (5) considering interventions and the leverage they offer, as well as the secondary consequences of them.

**Required for Purchase (NOTE: These are *not* available in the DU Bookstore. But they are easily found online and should be purchased soon, as there is reading due from these books already in Week 2).**

Meadows, Donella H. 2008. *Thinking in Systems: A Primer*. White River Junction, Vermont: Chelsea Green Publishing. ISBN 978-1-60358-055-7. Available on Amazon for about $10.

Todaro, Michael P. and Stephen C. Smith. 2012. *Economic Development,* 12th edition is available (Pearson ISBN 9780133406788) but not required given the expense; earlier editions will work; 11th is much less expensive. Even 10th edition is also ok, 11th better.

IFs software (no cost). Access to it and all manuals and documentation on IFs provided at time of first class session.

All other readings are available online.

**Prerequisites**. It is essential that you be willing to learn IFs. By far the best environment for that will be on your own computer, ideally a laptop. Bring a laptop to the first class and we will install IFs together. IFs runs only under Windows, so if you have a Mac, you also need Windows running on it (see here for instructions: pardee.du.edu/use-international-futures-ifs-apple-macintosh).

Forecasting techniques can be highly technical, but many, perhaps even most, are not. This class assumes no prior knowledge in forecasting. Nor does it assume any sophisticated statistical background. Yet some statistical capability would be valuable; minimally you need to understand the basic elements of correlation and regression. Some economics background (about equivalent to macroeconomics) is very desirable. Students must have a willingness to develop basic understandings of statistics throughout the course.

**Course Requirements and Grading.** This is a skills-building course and requires an active learning-by-doing approach. You will build towards a final report by producing interim products (deliverables) at roughly three-week intervals. The first deliverable will count for 15% of your final grade. The second interim report will count for 25% of your final grade. The final report will account for 60% of the course grade.Please submit all papers electronically to [jmoyer@du.edu](mailto:jmoyer@du.edu) with the following naming convention as the email subject: IFs; Deliverable #; Your Last Name; Paper Title (for example: IFs Moyer Deliverable #1 Uganda Development Report).

The final paper is due on Wednesday, November 23, midnight MST. Late papers will be penalized.

The final paper can take various forms and should be a professionally written forecasting analysis for a real-world client (government agency/ministry, NGO, IGO, research institute, etc.). It should use quantitative and qualitative analysis methods to explore the development prospects of a country/region or specific issue area. The following questions should be considered in the report.

1. What are the trends and variables that have shaped the development of the subject you are forecasting?
2. What is the development trajectory of the subject you are exploring along the current path (at least through 2030)? This will include an evaluation of the forecasts from the IFs modeling system as a foundation and presentation (and justification) of an alternative base case trajectory if you disagree with that of the model. A discussion of the major challenges posed by the development trajectory and an identification of goals that you believe should be aggressive but reasonable for the country or issue.
3. How do we get to a more optimal outcome? Present alternative scenarios, including specific analysis of the actions action required to achieve aggressive but reasonable goals.

The final paper should be **a maximum of 25 pages** for all components not including title page, table of contents, bibliography, and appendices. The paper should have the character of a professional report (title page, executive summary/abstract, table of contents, etc.). It should be single spaced with double spacing between paragraphs.

The following list of recent reports/briefs produced by the Pardee Center cover a range of topics. Each uses IFs to explore a question and may inspire your paper choice this quarter!

* The African Futures Project is a collaboration between Pardee and the Institute for Security Studies, a Pan-Africa think tank. This partnership began in 2010 and has produced a series of policy briefs: [pardee.du.edu/african-futures](http://pardee.du.edu/african-futures)
* A report exploring development policy choices facing Uganda to inform the Country Development Coordination Strategy for USAID: pardee.du.edu/advancing-development-uganda-evaluating-policy-choices-2016-21-and-selected-impacts-2040
* United Nations Development Programme supported paper analyzing “aggressive but reasonable” policy interventions to improve human development: pardee.du.edu/development-oriented-policies-and-alternative-human-development-paths
* A report exploring trade-offs in emphasizing different policy interventions to improve development in Africa. Produced for New Partnership for African Development, a technical body of the African Union: pardee.du.edu/nepad%E2%80%99s-integrated-approach-african-development-big-push-2063
* A report exploring the relationship between different demographic structures and political risk written in conjunction with the Atlantic Council (US based think tank) for Zurich Insurance: pardee.du.edu/understanding-and-forecasting-demographic-risk-and-benefits
* A paper written in conjunction with the World Bank exploring the potential for poverty alleviation in fragile states: pardee.du.edu/opportunities-and-challenges-world-negligible-senescence-0
* A report written for the SENS foundation exploring trade-offs in the extension of human life expectancy: pardee.du.edu/opportunities-and-challenges-world-negligible-senescence-0

**September 13. Class 1. Introduction.**

Please expect the first session to last three hours.

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)). Read chapters 1 and 2 fairly carefully. Skim chapter 3.

Chapter 1: Introduction

Chapter 2: Building a World Model: The Toolkit

Chapter 3: The Evolution of World Modeling

Klugman, Jeni, ed. 2002. *A Sourcebook for Poverty Reduction Strategies*, Volume 1: Core Techniques and Cross-Cutting Issues (Washington, D.C.: World Bank).

Chapter 1: Overview, pp. 1-24. [siteresources.worldbank.org/INTPRS1/Resources/383606-1205334112622/5301\_overview.pdf](http://siteresources.worldbank.org/INTPRS1/Resources/383606-1205334112622/5301_overview.pdf)

UN, The Millennium Development Goals Report 2014, through page 53. This can be skimmed fairly easily, but you should understand the goals, targets, and general trajectories.

un.org/millenniumgoals/2014%20MDG%20report/MDG%202014%20English%20web.pdf

**September 20. Class 2. Population.**

Meadows, Donella. 2008. *Thinking in Systems: A Primer.* White River Junction, Vermont: Chelsea Green Publishing.

Chapter 1: The Basics, pp. 1-11.

Chapter 2: A Brief Visit to the Systems Zoo, pp. 12-35.

Chapter 3: Why Systems Work so Well, pp. 75-85. (optional)

Chapter 4: Why Systems Surprise Us, pp. 86-110. (optional)

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 4.1: Demographics

United Nations, Department of Economic and Social Affairs, *World Population Prospects the 2015 Revision*.

*esa.un.org/unpd/wpp/Publications/Files/Key\_Findings\_WPP\_2015.pdf*

Todaro and Smith, *Economic Development* (chapters and pages from 10th edition; in 11th edition shown in parentheses)

Chapter 1 Economics, Institutions and Development: A Global Perspective, pp. 1-38 (2-36)

Chapter 2 Comparative Economic Development, pp. 39-108 (37-108).

Chapter 6 Population Growth and Economic Development, pp. 273-319 (269-310).

Reference Documents (not to read carefully):

Pardee IFs. 2014. Population model documentation.

[pardee.du.edu/sites/default/files/2014.03.05.b\_IFsDocumentation\_Population\_v10.pdf](http://pardee.du.edu/sites/default/files/2014.03.05.b_IFsDocumentation_Population_v10.pdf)

Pardee IFs. 2014. "IFs Scenario Analysis Manual." (also called Guide to Scenario Analysis in IFs), a resource for the entire course provided by instructor. Read the introductory section this week and the use the appropriate module sections throughout the term.

[pardee.du.edu/sites/default/files/2015.06.23\_IFsDocumentation\_Guide\_to\_Scenario\_Analysis\_v14.pdf](http://pardee.du.edu/sites/default/files/2015.06.23_IFsDocumentation_Guide_to_Scenario_Analysis_v14.pdf)

**September 27. Class 3. Education.**

*This class will be taught by Dr. Mohammod Irfan, lead developer of the IFs education sub-module (one of his many intellectual contributions to the IFs system).*

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 4.3: Education

Todaro and Smith, Economic Development

Chapter 8 (1st half). Human Capital: Education and Health in Economic Development, pp. 369-396 (359-385).

Dickson, Janet, Mohammod Irfan, Barry Hughes. 2010. *Advancing Global Education.* (Boulder, Co.: Paradigm Publishers and New Delhi: Oxford University Press). [ifs.du.edu/documents/pphp2download.aspx](http://www.ifs.du.edu/documents/pphp2download.aspx)

Chapter 2. Understanding the Education Transition and its Context, pp. 10-23

Chapter 3. The Historical Context, pp. 24-53.

Cohen, Joel E., David E. Bloom, Martin B. Malin, and Helen Anne Curry. *Universal Basic and Secondary Education*, American Academy of Arts and Sciences 2006. [amacad.org/publications/cohen\_intro.pdf](http://www.amacad.org/publications/cohen_intro.pdf)

Introduction: Universal Basic and Secondary Education, pp 1-8.

Hannum, Emily and Claudia Buchmann, “The Consequences of Global Educational Expansion,” American Academy of Arts and Sciences 2003. [amacad.org/publications/monographs/Ubase.pdf](http://www.amacad.org/publications/monographs/Ubase.pdf)

Introduction: Universal Basic and Secondary Education, all (about 30 pages).

Reference Documents:

Pardee IFs. 2014. Education model documentation.

[pardee.du.edu/sites/default/files/2015.06.16\_IFsDocumentation\_Education\_v25.pdf](http://pardee.du.edu/sites/default/files/2015.06.16_IFsDocumentation_Education_v25.pdf)

**October 4. Class 4. Economy.**

**Deliverable 1 due at the beginning of the class session sent via email (see instructions above).** 9 pages maximum.

Todaro and Smith, Economic Development

Chapter 3 Classic Theories of Economic Growth and Development, pp. 109-157 (109-154)

Chapter 4 Contemporary Models of Development and Underdevelopment, pp. 158-206 (155-201)

Chapter 5 Poverty, Inequality, and Development, pp. 207-272. (202-268)

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 5.1: Economics

Chapter 5.2: Government Finance

World Bank. 2013. *Global Economic Prospects 2016 (June Update)*

pubdocs.worldbank.org/en/842861463605615468/Global-Economic-Prospects-June-2016-Divergences-and-risks.pdf

Harpaul, Alberto Kohli and Natasha Mukherjee. "Potential Costs to Asia of the Middle Income Trap”. 2011. *Global Journal of Emerging Market Economies* 3 (3): 291-311. DOI: 10.1177/097491011100300303.

Hughes, Barry and others. 2009. *Reducing Global Poverty* (Boulder, Co.: Paradigm Publishers and New Delhi: Oxford University Press). [ifs.du.edu/documents/pphp1download.aspx](http://www.ifs.du.edu/documents/pphp1download.aspx)

Chapter 3. Drivers and Strategies for Poverty Reduction, pp. 22-42.

Margolese-Malin, Eli, Jonathan D. Moyer, Mickey Rafa, and Mohammod Irfan. “Enterprising Cape: Building an Inclusive and Vibrant Economy.”

[issafrica.org/publications/policy-brief/enterprising-cape-building-an-inclusive-and-vibrant-economy](https://www.issafrica.org/publications/policy-brief/enterprising-cape-building-an-inclusive-and-vibrant-economy)

Pardee IFs. 2014. Economic model documentation.

[pardee.du.edu/sites/default/files/2015.07.20\_IFsDocumentation\_ Economic\_v43.pdf](http://pardee.du.edu/sites/default/files/2015.07.20_IFsDocumentation_Economic_v43.pdf)

**October 11. Class 5. Health.**

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 4.2: Demographics

Hughes, Barry, Randall Kuhn, Cecilia M. Peterson, Dale S. Rothman, José Solorzano. 2011. *Improving Global Health* (Boulder, Co.: Paradigm Publishers and New Delhi: Oxford University Press). Read or look at other chapters as of interest to you, perhaps especially those on proximate driver analysis or forward linkages.

pardee.du.edu/pphp-3-improving-global-health

Chapter 2: Understanding Health: Concepts, Relationships and Dynamics

Chapter 3: Forecasting Global Health

Chapter 4: The Current Path as it Seems to Be Unfolding

Todaro and Smith, Economic Development

Chapter 8 (Second half): Human Capital: Education and Health in Economic Development, pp. 397-430 (386-415).

Meadows, Donella. 2008. *Thinking in Systems: A Primer.* White River Junction, Vermont: Chelsea Green Publishing.

Chapter 5: System Traps…and Opportunities, pp. 111-141

Chapter 6: Leverage Points—Places to Intervene in a System, pp. 145-165

Pardee IFs. 2014. Health model documentation.

[pardee.du.edu/sites/default/files/2014.09.01\_IFsDocumentation\_ Health\_v48.pdf](http://pardee.du.edu/sites/default/files/2014.09.01_IFsDocumentation_Health_v48.pdf)

**October 18. Class 6. Socio-political/Governance.**

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 5.3: Governance and Broader Socio-Political Modeling

Hughes, Barry, Devin K. Joshi, Jonathan D. Moyer, Timothy D. Sisk, José Solorzano. Strengthening Governance Globally. (Boulder, Co.: Paradigm Publishers and New Delhi: Oxford University Press). [pardee.du.edu/sites/default/files/PPHP5\_Full\_Volume.pdf](http://pardee.du.edu/sites/default/files/PPHP5_Full_Volume.pdf) [Sept 5, 2015]

Chapter 1. Understanding Long-term Governance Transitions, pp. 1-18.

Chapter 2. Assessing Evolution of Governance, pp.20-43.

Chapter 3. The Dynamics of Change, pp. 46-69.

Chapter 4. Forecasting Governance, pp. 72-97.

Goldstone, Jack A., Robert H. Bates, David L. Epstein, Ted Robert Gurr, Michael B. Lustik, Monty G. Marshall, Jay Ulfelder, and Mark Woodward. “A Global Model for Forecasting Political Instability.” American Journal of Political Science 54, no. 1 (January 2010): 190–208. doi:10.1111/j.1540-5907.2009.00426.x.

Hendrix, Cullen S. “Measuring State Capacity: Theoretical and Empirical Implications for the Study of Civil Conflict.” Journal of Peace Research 47, no. 3 (May 1, 2010): 273–85. doi:10.1177/0022343310361838.

Pardee IFs. 2014. Governance model documentation.

[pardee.du.edu/ifs-governance-and-socio-cultural-model-documentation](http://pardee.du.edu/ifs-governance-and-socio-cultural-model-documentation)

**October 25. Class 7. Infrastructure and Energy.**

**Deliverable 2 due at the beginning of the class session:** 17 pages maximum (including your revision of Deliverable 1).

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 6.2: Energy

Chapter 6.3: Infrastructure

Rothman, Dale S., Mohammod T. Irfan, Eli Margolese-Malin, Barry B. Hughes, Jonathan D. Moyer. *Building Global Infrastructure*. ifs.du.edu/documents/pphp4download.aspx [Sept 7, 2014]

Chapter 1. Introduction, pp. 1-17.

Chapter 2. The Story so Far, pp. 19-49.

Chapter 5. Infrastructure Development and Spending in the IFs Base Case, pp. 112-144.

International Energy Agency. 2015. *World Energy Outlook.* Executive Summary

iea.org/publications/freepublications/publication/WEB\_WorldEnergyOutlook2015ExecutiveSummaryEnglishFinal.pdf

International Energy Agency. 2011. *Special Report: Are We Entering a Golden Age of Gas?*

worldenergyoutlook.org/media/weowebsite/2011/weo2011\_goldenageofgasreport.pdf

Pardee IFs. 2014. Energy model documentation.

[pardee.du.edu/sites/default/files/2014.10.17\_IFsDocumentation\_Energy\_v9.pdf](http://pardee.du.edu/sites/default/files/2014.10.17_IFsDocumentation_Energy_v9.pdf)

Pardee IFs. 2014. Infrastructure model documentation.

pardee.du.edu/sites/default/files/2013.07.22\_IFsDocumentation\_Infrastructure\_v11.pdf

Meadows, Donella. 2008. *Thinking in Systems: A Primer.* White River Junction, Vermont: Chelsea Green Publishing.

Chapter 7. Living in a World of Systems, pp. 166-186.

**November 1. Class 8. Food and Agriculture.**

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 6.1: Agriculture and Food

International Food Policy Research Institute. 2016 Global Food Policy Report.

ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/130209/filename/130420.pdf

Fan, Shenggen, "Halving Hunger: Meeting the First Millennium Development Goal Through Business as Unusual." 2010. IFPRI Food Policy Report. 16 pages.

ifpri.org/sites/default/files/publications/pr22.pdf

Nelson,Gerald C. et al "Climate Change: Impact on Agriculture and Costs of Adaptation." 2009. IFPRI Food Policy Report. 19 pages.

ifpri.org/sites/default/files/publications/pr21.pdf

FAO. 2011. *Looking Ahead in World Food and Agriculture: Perspectives to 2050,* edited by Piero Conforti.

fao.org/docrep/014/i2280e/i2280e.pdf

Chapter 1: 2030/2050 Highlights, pp 11-56

Chapter 2: IFRPI's Long-term Outlook, pp 57-94

Pardee IFs. 2014. Agriculture model documentation.

[pardee.du.edu/sites/default/files/2014.04.28\_IFsDocumentation\_Agriculture\_v20.pdf](http://pardee.du.edu/sites/default/files/2014.04.28_IFsDocumentation_Agriculture_v20.pdf)

**November 8. Class 9. The Environment.**

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 6.4: The Environment

Intergovernmental Panel on Climate Change (IPCC). Synthesis Report Summary for Policymakers.

ipcc.ch/pdf/assessment-report/ar5/syr/AR5\_SYR\_FINAL\_SPM.pdf

United Nations. World Water Development Report. 2015. [unesdoc.unesco.org/images/0023/002318/231823E.pdf](http://unesdoc.unesco.org/images/0023/002318/231823E.pdf)

Executive Summary and Prologue. The Future of Water – A Vision for 2050, pp. 1-7

Chapter 1. Unsustainable Growth, pp. 10-13

World Wildlife Foundation. Living Planet Report 2012: Biodiversity, biocapacity and better choices. Full Report (162 pages) available awsassets.panda.org/downloads/1\_lpr\_2012\_online\_full\_size\_single\_pages\_final\_120516.pdf

Read lightly through Chapter 1 (The State of the Planet) pp 14-67 and look at their forecast of footprint on page 100.

Todaro and Smith, *Economic Development*

Chapter 10. The Environment and Development, pp. 483-529 (465-510).

Pardee IFs. 2014. Environment model documentation.

[pardee.du.edu/sites/default/files/2015.02.26\_IFsDocumentation\_ Environment\_v4\_0.pdf](http://pardee.du.edu/sites/default/files/2015.02.26_IFsDocumentation_Environment_v4_0.pdf)

**November 15. Session 10. Taking Stock of Forecasting Change and Development**

Hughes, Barry. Exploring and Understanding International Futures. *Manuscript.* Emailed to class (if you didn’t receive this manuscript, please email [jmoyer@du.edu](mailto:jmoyer@du.edu)).

Chapter 7: How well do we do?

**International Futures**

*Rubric for Evaluation of Final Deliverable*

* Is the subject matter clearly defined and introduced? Is the logic of presentation made clear to the reader via an abstract, overview, and/or table of contents?
* Is the historical evaluation well conceptualized and presented? It should be both reasonably comprehensive across issue areas and also tightly presented.
* Are lessons drawn from the historical evaluation so that we understand the major contemporary issues and challenges?
* Are the base case forecasts convincing and reasonable? Are appropriate adjustments suggested and made? Is the coverage both reasonably comprehensive and tightly presented?
* Are lessons drawn from the base case analysis so that we understand the major issues and challenges of the forecast horizon (to at least 2030)?
* Are appropriate goals/targets suggested and given specific operationalization?
* Is alternative forecasting so as to analyze goal attainment undertaken? Is at least one aggressive but reasonable scenario developed and is it well-designed and credible? Are constraints and trade-offs handled appropriately (with avoidance of unrealistic “free” interventions and “assumed success” in the model)?
* Is the logic (and are key drivers) of the interventions well-understood and presented? Is it presented in causal diagram(s) form?
* Overall, is the argument of the paper clearly and convincingly presented?
* Is the paper technically sound in terms of organization, language use, aides to presentation (tables, graphs, etc), pagination, readability, strong bibliography (not just fluffy web materials) and citations, etc.?