

Graduate Connection

Vol. 25 No. 1

September 2019

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Graduate Student Handbook

The Department's *Graduate Student Handbook* containing the Department's policies and degree requirements is reissued each summer. First-year students will have received a hard copy. Other students can find an electronic copy under Graduate > Current Student Resources on our website.

News

Department Management

There are some changes to the Department's management team with **Joe Ferrie** taking over as Department Chair for a three-year term. We are grateful for the efforts of **Larry Christiano** during the past three years.

The team is:

- Joseph Ferrie**: Department Chair
- Ian Savage**: Associate Chair
- Wojciech Olszewski**: Director of Graduate Studies
- Lori Beaman** and **Giorgio Primiceri**: Co-Directors of Graduate Admissions
- Alessandro Pavan**: Director of Graduate Placement
- Robert Gordon**: Chair of the Undergraduate Studies Committee
- Mark Witte**: Director of Undergraduate Studies

Faculty Changes

This fall we welcome **Molly Schnell** as an assistant professor. She works on applied microeconomics and health

economics. She completed her PhD at Princeton University. She is in room 3437.

We said goodbye to **David Berger** who has moved to Duke University.

A number of faculty will be on leave and away from campus. **Seema Jayachandran** is away for the entire year at Stanford University. **Marti Mestieri** is on leave for the year at the Federal Reserve Bank of Chicago, but is still teaching Econ 460-3 in the Fall Quarter. **Igal Hendel** remains on leave at Amazon.

Ron Braeutigam is now an emeritus professor.

Staff Changes

Mercedes Thomas left the University in July. Starting September 9, **Alison Stoute** takes up the role of Graduate Program Manager. She previously worked at Drexel University in Philadelphia and brings a wealth of knowledge and experience in student services and advising. She will manage all areas of the graduate program including admissions and recruitment, student services, funding, the job market and events. The graduate program manager will continue to be assisted by **Rita Savakis**.

Start of Year Reception

Our start-of-year reception for faculty, staff and graduate students, will be held on Sunday afternoon, September 29, from 1:00PM to 3:00PM at the Allen Center.

The event will feature the Allen Center's famed buffet lunch and a chance to enjoy the lakefront. Family members are welcome. Our traditional

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awards will also be handed out. See also the "Events" section.

Nemmers Prize

The 2018 winner of the Nemmers Prize, **David Kreps** of Stanford University, returns for his second visit from October 15 to November 15. During this visit he will teach a short course on "From Discrete- to Continuous-Time Models in Economics, and Back Again" (see the announcement on the final page of this newsletter). The Nemmers Prize is a biennial honor bestowed on an outstanding economist who has yet to win the Nobel Prize.

Visitors and Postdocs

We have a number of visitors who will be here for the entire academic year. Macroeconomist **Christina Patterson** is taking a postdoc year following her PhD at MIT. She is in room 3449. Economic historian **Michele Rosenberg** is a postdoc in the Center for Economic History. He is in room 3197. Development economist **Nilesh Fernando** from the University of Notre Dame is in room 3439.

Visiting for the Fall Quarter is macroeconomist **Yamin Ahmad** from the University of Wisconsin at Whitewater.

Shorter term visitors include econometrician **Michael Leung** from the University of Southern California for the month of October, and IO economist **Carlos Noton** and behavioral economist **Rosario Macera** from Chile for November and December. Alum and IO economist **Eugenio Miravete** from the University of Texas will visit from mid-November to mid-December.

Additional visitors in Winter and Spring Quarters will be introduced in the December and March editions of the *Graduate Connection*.

Honors

Congratulations to **Ludvig Sinander** as the recipient of the inaugural Susan Bies (PhD, 1972) Fellowship for the 2019-20 academic year. Additional fellowships and honors will be announced at the Start of Year Reception on September 29.

Congratulations to Professor **Mar Reguant** on the award of a Presidential Early Career Award for Scientists and Engineers.

Welcome to our First-year Grad Students!

Welcome to the Department of Economics and to Evanston. We hope that your years with us are productive and fulfilling. Please take the opportunity to become acquainted with other graduate students and the faculty. A good way of doing this is at the TGIF event held most Fridays at 5:00PM in the light court (room 3322).

The Director of Graduate Studies has prepared some information on goals for first-year students that answers many frequently asked questions. This is posted on our web site in the "Graduate > Degree Requirements and Goals" section.

The Graduate School has a language testing regime for Teaching Assistantship (TA) eligibility. All of our new first year students, excepting those from Australia, Canada, New Zealand, USA, and the UK, and those that did well on the Speaking Section of the TOEFL Internet-based test, will need to schedule the Versant English Test during the next two weeks. Students will have to score at least 65 to be eligible to be a TA. Otherwise they will be placed in English as a Second Language (ESL) programs.

TAships are the primary form of financial support in years two through four. Please place a high priority on making sure that you meet the language requirement (full details are in the "Goals for First Year Students" page on our website). In the past, otherwise qualified students have

gone unfunded because they did not meet the language requirement.

Events

University Orientation for First Year Students

The Graduate School will hold a general orientation for all new graduate students from 8:45AM to 4PM at Pick-Staiger Concert Hall and the Norris University Center on Friday, September 20. Information will be available on campus and community resources, health services, financial issues and other practical issues.

Teaching Assistant Training

The training of new Teaching Assistants will be held on Thursday, September 19. This is organized by the Searle Center for Advancing Learning & Teaching. All TAs who will be teaching for the first time this year, or missed last year's program, are required to attend. The training will last from 8:30AM to 1:45PM. Please go to the main lobby of Technological Institute to check in and receive directions to the room that will be used for the sessions designed and held solely for TAs from the Economics Department. These will be led by **Utsav Manjeer**, an accomplished TA in the Department. You do need to register for the conference. Go to: <https://www.northwestern.edu/searle/> and click on "Initiatives > Grads and Postdocs" then "New TA Conference" for more information, and to register.

Orientation for Second Year Students

Second year students are invited to attend a session on Monday, September 23 from 12:30PM – 3:00PM in room 1410. Presentations will be made on the goals for the second and third year of our program, and the requirements for departmental

funding. Short presentations will be made by faculty describing the field course choices available in the Department and within the Kellogg School of Management.

Orientation for Students on the Job Market

Alessandro Pavan, Director of Graduate Placement, will be holding an orientation session for students who are thinking about going on the job market this academic year on Wednesday, September 25 at 5:00PM in room 3301. For more details see the Placement Report below.

Start-of-Year Reception

Faculty, staff, graduate students, and their families are all invited to the start of year lunch buffet and reception that will be held at the Allen Center from 1:00PM to 3:00PM on Sunday, September 29.

This reception will also feature the awarding of the Department's Distinguished Teaching Assistant awards for last year, the Bies Essay awards, and the Eisner Fellowship.

E-mail invitations have been sent out. Book your spot through [Eventbrite](http://Eventbrite.com) nueconomicsfallbuffet2019.eventbrite.com by noon on Monday, September 23. Family members and children welcome.

Save the Dates

Friday and Saturday April 17-18 2020:

The Center for Economic History at Northwestern will host an international conference on the topic of War and Economic History

Tuesday April 28, 2020: The annual Susan Bies (PhD, 1972) departmental lecture on economic policy. This year's speaker will be **Darrell Duffie** of Stanford University.

Full details in the March *Graduate Connection*.

Teaching

Course Offerings 2019-20

The schedule for graduate courses for the coming year is shown on the "Graduate > Class Schedules" page of the Department's web site, along with the timings for each quarter.

Advice on Field Sequences

The Department has guidance on acceptable field course sequences. These are posted in the Graduate > Degree Requirements and Goals > Second and Third Year Goals section of our website.

Economics 590

You have to be registered for at least three course credits each quarter to be considered a full-time student.

Students in their first eight quarters at Northwestern (that is to say the first and second years including summers) are considered to be completing "residency." If you are taking less than three courses for credit - which will occur in both summers and perhaps some academic year quarters in your second year - you can register for Econ 590 "Research" to make up the difference. You can register for up to 3 units per quarter. It is on a P/N basis. The Director of Graduate Studies is listed as the faculty member for grading this registration.

Students beyond the eighth quarter, should not use Econ 590. They should register for TGS 500 (or TGS 512 in certain circumstances).

Registering for Research Workshops

While it is not part of the formal degree requirements, attending research seminars is probably one of the most valuable aspects of your graduate education. You get to meet

leaders in each field and observe the cutting edge of new research. We suggest that starting in your second year, students should regularly attend one or more of our workshop series. As a signaling and commitment device you can formally register for one or more of these series. These registrations will be offered in Fall and Spring Quarters. We suggest that students just register for the series in which they have a genuine interest (if you are just looking for "filler" to maintain your full-time status of 3 courses per quarter, then Econ 590 for second year students and TGS 500 for older students are the most appropriate registrations).

Incomplete Grades

The Department has a policy to avoid the problem of excessive awarding of incomplete grades. Please see our web site for a complete statement. Report any problems to the Director of Graduate Studies.

This Quarter's Course Descriptions

Department of Economics Classes

Economics 412-1

Economic Theory and Methods

Professor Dworzak

T 3:30-7:20

Class will meet 3;30-5:50 in KGH 3301 and 6:00-7:20 in KGH 1410.

This is a theory topics course intended for graduate students who are about to start (or have already started) doing research. The course is a review of recent papers applying theoretical tools (mechanism design, information design, game theory) to important financial market design issues such as the optimal frequency of trade, size and price discovery, pre- and post-trade transparency, design of financial benchmarks, stress tests, and cryptocurrencies.

The course is suitable both for theory students who had little prior

exposure to finance and for theory-minded finance students who would like to expand their toolkit.

Evaluation will be based on in-class participation, presentation of a research paper, and a research proposal

Economics 414-1

Economics of Information

Professor Wolinsky

MW 9:00-10:50

KGH 3301

This course will survey some of the central topics in the economics of information. Among them are formal descriptions of information and measures of informativeness, implementation / mechanism design, search, and information aggregation by markets. The course will present both foundational models and ideas and more applied ones.

Economics 416-1

Advanced Macroeconomics

Professor Lorenzoni

TTh 1:30-3:20

KGH 3301

The course covers advanced topics in macroeconomics. In particular, it will cover models that emphasize the role of heterogeneity in the economy, especially focusing on how it affects consumer spending. We will also cover different ways of introducing frictions in financial markets and the role of financial intermediaries in the economy (incomplete markets, default, limited enforcement, asymmetric information). Finally, the course covers deviations from rational expectations and their relevance for the study of bubbles, financial stability and inflation.

Economics 425-1

Development Economics

Professor Beaman

MW 3:30-5:20

KGH 3301

This is the first quarter in the 425 sequence on development

economics. The goal of the sequence is to introduce the central issues in development economics and to explore the application of microeconomic analysis, using theory and econometrics, to gain deeper insights into these questions. Applications will relate to empirical microeconomic issues in developing countries. The course will cover topics including: health, education, gender inequality, corruption, property rights, and social networks. Empirical methods will be emphasized throughout.

Evaluation will be based on referee reports, in-class presentations, small projects, and a research project.

Economics 440-1

Labor Economics

Professor Notowidigdo

TTh 9:00-10:50

KGH 3301

This course studies topics in labor economics, surveying both theoretical and empirical work in the field. The topics will be focused around the core areas of labor supply, labor demand, and human capital.

The theoretical models will include dynamic labor supply models, models of skill-biased technological change, and models of signaling, skill premia, and self-selection. The empirical work will focus on recent papers studying human capital, inequality, trade / offshoring, and immigration.

Evaluation will be by several problem sets, which include both theoretical and empirical work, as well as a comprehensive final exam.

Economics 450-1

Industrial Organization

Professor Illanes

MW 1:30-3:20

KGH 1410

This course is an introduction to industrial organization theory and empirical analysis. The course begins with an introduction to the methodologies used to estimate production and demand functions.

Then the course studies how these techniques have been applied in empirical studies of differentiated products industries. The emphasis will be on the estimation and testing of game theoretic models, and especially on recent developments in the field.

Evaluation will be by several problem sets and a final exam.

Economics 460-3

International Economics

Professor Mestieri

TTh 6:00-7:50pm

KGH 3301

Building on the materials studied in Econ 460-2, this course covers selected research topics in international trade and its implications on economic growth and development. This year, it also has guest lectures by Jing Zhang (on comparative advantage, trade and structural change), Jonathan Dingel (sorting and heterogeneity across space and empirics on the home-market effect), Rodrigo Adao (sorting and adjustment to shocks) and some advanced graduate students.

The evaluation will be based on a research proposal (90%) plus class participation (10%).

Economics 481-1

Advanced Econometrics

Professor Horowitz

MW 5:30-7:20pm

KGH 1410

Semi- and Nonparametric Methods In Econometrics. This course has two main parts. The first part will present semiparametric and nonparametric methods for estimating probability density functions, conditional mean and quantile functions, and other functions that are identified by moment conditions. These methods include kernel and series estimation, dimension reduction methods such as index and additive models, and nonparametric instrumental variables estimation. The second part of the course will present certain machine learning methods, including methods

for high-dimensional estimation. The methods that will be discussed include penalized least squares, penalized maximum likelihood, and support vector machines for binary classification.

The course will present the relevant theory and give examples of the use and performance of the methods that are covered, including empirical examples of the differences between nonparametric and parametric estimates.

Students will be asked to make a presentation, work problem sets, and write a paper in which one or more of the methods covered in the course is investigated further or applied to real data. There will be no examinations.

Economics 482

Applied Time-Series Econometrics
Professor Primiceri
TTh 11:00-12:50 KGH 1410

This is a course on empirical macroeconomics, with a focus on Bayesian methods to conduct inference in macro-econometric models. The emphasis on Bayesian inference is motivated by the increased popularity of this methodology, which is gradually becoming the dominant paradigm in macro/time-series empirical work. Topics include Bayesian methods for prediction with big data and large information sets, vector autoregressions (VARs), structural VARs, state-space models, time-varying parameters and stochastic volatility models, estimation of linear and nonlinear dynamic stochastic general equilibrium (DSGE) models, model comparison and model choice.

Evaluation will be based on homework assignments and a final take home exam or research project.

Not for Credit Short Course

From Discrete- to Continuous-Time Models in Economics, and Back Again
Professor Kreps
Th Oct 24 12:15-1:15 KGH 4302
MW 12:00-1:30 KGH 3301
From Oct 28 to Nov 13

See announcement on the final page of this newsletter.

Other Departments' Classes

See the Department's field sequence rules before registering for any of these classes.

Finance 585-1

Asset Pricing I
Professor Skiadas
F 1:00-4:15 KGH 4302

An in-depth introduction to competitive asset pricing theory: arbitrage pricing, equilibrium pricing and optimal consumption/portfolio choice. Models are developed for a finite information tree, but from an advanced perspective that motivates and builds intuition toward continuous-time modeling.

No textbook purchase is required. Self-sufficient lecture notes will be handed out. The material covered is, for the most part, also covered by *Asset Pricing Theory* by Costas Skiadas (Princeton U.P., 2009).

Evaluation will be by weekly assignments (40%), a midterm exam (30%), and a final exam (30%).

Finance 586-1

Corporate Finance I
Professor Milbradt
M 3:30-7:20 KGH 4302

This course introduces students to theories of corporate financing and investment decisions; optimal financial contracting and security design; financial intermediation; and financial crises. The course studies the effects of incentive problems and asymmetric information.

Evaluation will be by homework assignments, two referee reports and a final exam.

MECS 540-1

Political Economy I
Professor Persico
T 3:30-6:30 KGH 5201

Budget Deficits: A Political Economy View. Budget deficits are a defining feature of the contemporary state. Starting in the 1960's, most developed countries have been running persistent deficits. Today, government debt levels exceed the GDP in many countries. The high taxes needed to refinance this debt distort the real economy and reduce growth. Future generations will bear the burden. What caused these budget deficits? Can we expect them to persist? What impact do they have on the real economy? Are they the necessary side-effect of democracy, and are some political institutions better than others at containing the debt?

This class will review the economic and political-economic literature on budget deficits. It will cover theoretical and empirical papers on topics including: economic and politico-economic models of government debt; the impact of debt on growth; the effect of fiscal rules; and sovereign defaults. The emphasis will be on recent developments in the field. The course is designed to be complementary with Public Finance and Macroeconomics.

Evaluation will be by written assignments and class participation.

MECS 549-1

Economics of Innovation
Professor Spulber
W 3:30-6:30 KGH 4273

This course considers the empirical analysis of technology and technological change. The course examines the characteristics, modeling, and measurement of

technology, including products, production processes, and transaction methods. The course then examines empirical analysis of technological change, including invention, innovation, adoption, and diffusion. Topics include research and development (R&D), patents and other intellectual property (IP), markets for technology, entrepreneurship, and technology standards.

The course is a seminar with lectures and class discussion. Evaluation is based on writing a short research paper. The course provides guidance and directions on how to prepare a research paper.

MECS 550-1

Economic Theory
 Professor Klibanoff
 Th 2:00-5:00 KGH 4273

This is a course on decision theory and will focus mainly on theories of individual decision making under risk and uncertainty. The course begins with classical theories and their foundations. Then it will explore a selection of topics that expand on the classical work in various directions and are nearer to the current research frontier. These topics may include: (1) Ellsberg's paradox, models of ambiguity and uncertainty attitude; (2) dynamics -- preferences over time, dynamic consistency, updating, time and risk; (3) probabilistic sophistication; (4) risk measures; (5) models of unforeseen contingencies / preference for and against flexibility; (6) incomplete preferences; (7) prospect theory; (8) stochastic choice. Which of these or other topics will be covered may vary depending on time and the interests of members of the class.

Evaluation will be by problem sets, class participation, and presentation of a topic or paper from the literature. Required reading includes the book *Notes on the Theory of Choice* by David Kreps (Westview Press, 1988) and selected papers.

MECS 551-1

Health Economics
 Professor Dranove
 TTh 12:05-1:25 KGH 4273

After an introduction to the institutions of healthcare markets, students will read and discuss health economics research in the areas of medical R&D, demand for healthcare, healthcare providers, and health insurance. Each class will feature a combination of lecture and student presentations of seminal papers. Students will be also introduced to a wide variety of healthcare data sources and begin work on an original empirical research project to be completed during the second course of the sequence,

Evaluation will be based on the presentation of research papers, in-class discussions, a research proposal, and final exam.

The second course in the sequence will be Econ 498-1 with Professor Schnell in Winter Quarter.

MECS 560-1

Static Optimization in Economics
 Professor Shmaya
 Sat 11:00-2:00 KGH 4130

The course is about recognizing and solving convex optimization problems that arise in applications. The first half will introduce the theory of convex optimization, duality and Karusch Kuhn Tucker theory. The second half will be about applications to statistics, machine learning, game theory, and finance.

The textbook is *Convex Optimization* by Boyd and Vandenberghe (Cambridge, UP, 2004) that is available free online. Chapter 1 of the textbook gives a good indication of the course' material and goals.

Evaluation will be based on a final exam.

MECS 570-1

Economics of Organizations
 Professor Powell
 T 3:30-6:30 KGH 4301

The first in a two-quarter sequence. This course is an introduction to research in organizational economics, which can be succinctly described as the economics of managed relationships. This course focuses on theories of incentives, adaptation, and firm boundaries, with the ultimate aim of understanding how firm practices affect and are affected by the broader economy. The main practical emphasis will be on developing applied modeling skills.

Evaluation will be by model-development essays and in-class presentations of recent papers. The required text is *The Handbook of Organizational Economics*, edited by Robert Gibbons and John Roberts, (Princeton U.P. 2013).

Economics 501 Seminar

The 501 seminar is the principal mechanism by which students meet the Department's requirement that they write and present two research papers (in addition to the history paper requirement).

For 2019-20 the seminar will be run by Professor Wolinsky in the Fall Quarter and Professor Pavan in the Spring Quarter. The random drawing of the order of student presentations was included in the March *Graduate Connection*.

The seminar will be held in the Fall and Spring Quarters on Mondays and Wednesdays from 11AM to 11:50AM, and Fridays from 2PM to 2:50PM. The specific dates for the Fall are:

Week	M 11-12	W 11-12	F 2-3
9/23	No Class	Topbas	Bohr
9/30	Paluszynska	Flor Toro	Maeba
10/7	Xu	Thomas	Strada
10/14	Geddes	Camara, S	
10/21	Campillo Betancourt	Petri Betto	

10/28	Guerreiro	Ozminkowski	Vaidya
11/4	Cannella	Kim, P	Heard
11/11	Murakami	Puglisi	Kim, D.
11/18	Litvin	Hu	Lee
11/25	Cai		Thanksgiving
12/2	Hallmann	Yavuz	

Pareto improving exchanges are only permissible with the agreement of Professor Wolinsky. Full practical details for the 501 Seminar are given on our web site.

Specific dates for the Spring Quarter will appear in the March *Graduate Connection*. However, the (random) order of presentations was included in last March's edition and is: Kim, Paul

Lee, Siu Hong (Jimmy)

Hallmann, Carl

Puglisi, Federico

Yavuz, Emre Enes

Guerreiro, Joao

Vaidya, Udayan

Camara, Santiago

Paluszynska, Aleksandra

Xu, Boli

Campillo Betancourt, Eduardo

Strada, Kelly Gail

Geddes, Eilidh

Heard, Christopher

Murakami, Megumi

Flor Toro, Jose

Cai, Yong

Ozminkowski, Nicole

Cannella, Mario

Kim, Deborah

Petri Betto, Maria Fernanda

Hu, Jingxiang

Litvin, Valentyn

Bohr, Clement

Maeba, Kensuke

Thomas, Matthew

Please note some administrative arrangements:

1. Students must register for Econ 501 in the Fall and Spring of their third year.
2. The signed approval form must be returned to the Graduate Program Manager within two weeks of the presentation or by the Friday of exam week, whichever is earlier. At

least one of the faculty signing must hold a tenure-line appointment in the Economics Department.

3. A "pass grade" will be issued based on the signed approval form and satisfactory attendance.

Two pass grades are necessary to meet the Department's research paper requirement.

Formal Announcements

Funding Guidelines

The Department has formal rules for the allocation of funding for students in years two through six. This document is posted on our web site in the "Graduate > Funding" section. Please read this document as *the Department strictly enforces these funding criteria*.

Preliminary Examinations

First year students should familiarize themselves with the Department's rules on continuation to the second year. These are posted on our web site.

Dates for the prelim examinations for the coming year have been set. The ordering of the three examinations rotates each year.
Monday July 13: Macroeconomics
Friday July 17: Econometrics
Wed. July 22: Microeconomics
All examinations will be held 1:30PM – 4:30PM in room 1410.

Students should note that they are exempt from the prelim exam in any area in which they achieved a GPA of 3.40 or greater in the three first-year classes (e.g. in 410-1,2,3 for the microeconomics prelim exam). Students who are exempt in two areas, and their GPA in the third area is 3.0 or greater, are also exempt in the third area.

TA Periods in Residence

Each quarter that you are a TA, you are expected to be in Evanston on

weekdays from the first day of classes until the Monday after examinations end (which is the day that grades are filed). Absences during this period require permission of the instructor. In the past people have left early and arrived back late, in some cases without informing the instructor. The Department will not tolerate this. You must arrange your vacation airline flights so as to be able to fulfill your duties. This is especially true as you make travel arrangements for the coming holiday season. Failure to do so will be grounds for rescinding your TAship. For the coming year the dates for which you should be in attendance are:

Fall: Tues Sept 24 - Mon Dec 16

Winter: Mon Jan 6 - Mon March 23

Spring: Tues March 31 - Mon June 15

Spring Quarter Start Date

The University has decided that Spring Quarter will henceforth start on a Tuesday. Consequently the first day of Spring Quarter 2020 will now be Tuesday March 31.

Graduate School Deadlines

October 25 is the last day for return of the Application for a Degree for all candidates who expect their degrees to be awarded in December.

November 22 is the last day for submission of the COMPLETED dissertation and all supporting materials to the Graduate School for students who expect to receive the Ph.D. degree in December.

December 6 is the last day for receipt of the Final Examination Report and any Change of Grade forms to the Graduate School for Master's candidates who expect their degrees to be awarded in December.

Human Subjects Research

Even though we are a social science rather than a medical science,

it is possible that government restrictions on the privacy of human subjects may apply to your PhD dissertation. If you are collecting new data, or even using previously collected data, on individual identifiable people, then you may have to get prior approval for your research from Northwestern's Institutional Research Board. You should read the FAQ section of their web site to see if it applies to you:

<https://irb.northwestern.edu/>

The web site also includes information on the approval process, if that is necessary.

Students Working on NSF Grants

Federal law requires that all students supported by National Science Foundation undergo training in the responsible conduct of research. This will be accomplished by a one-time registration in ECON 519 that has two components: an online class and a "face-to-face" component. The online part asks the student to complete a 2-3 hour online class administered by a private company that Northwestern has hired. DGS Wojciech Olszewski will lead the face-to-face part of the class.

If you are being supported on an NSF grant for the first time, please contact Professor Olszewski for instructions.

Funding Opportunities

Non-Departmental Funding

There are a number of funding awards for continuing students that have application deadlines during the fall quarter. A special web page details these, and includes links to more details and application forms. See the link from the "Graduate > Funding" section of our web site.

In particular, NSF Fellowships available to U.S. citizens and

permanent residents, have a deadline of late October. You can apply on-line.

There is also information on the web page on how to obtain Graduate School funds for research expenses and attending conferences. The maximum one-time research grant is \$3,000 and there is funding for two conference during your time at Northwestern that covers up to a maximum of \$800 for each conference.

Placement Report

Best wishes are offered to the following people as they start their professional careers (academic appointments are in the economics department except where indicated):

Huseyin Cagri Akkoyun - Analysis Group, Dallas

Luca Bittarello - QuantCo, Cologne, Germany

Gideon Bornstein - University of Pennsylvania (Business School)

Gabriela Cugat - International Monetary Fund, Washington DC

Matias Escudero - Compass Lexecon, Washington DC

Michael Gmeiner - St Paul American School, Beijing, China

Sasha Indate - Duke University (Business School)

Nicolas Inostroza - University of Toronto (Business School)

Stephanie Johnson - Rice University

Krzysztof Kalisiak - Amazon, Seattle

Chiara Maggi - International Monetary Fund, Washington DC

Alexey Makarin - Einaudi Institute for Economics and Finance, Rome

Jonas Mishara-Blomberger - Analysis Group, Boston

Jordan Norris - New York University in Abu Dhabi

Aniket Panjwani - Charles Rivers Associates, Oakland CA

Egor Starkov - University of Copenhagen

Max Tabord-Meehan - University of Chicago

Nicholas Vreugdenhil - Uber Technologies, San Francisco

Sibo Wang - Capital University of Economics and Business, Beijing
Heyu Xiong - Case Western Reserve University

This Year's Job Market

Alessandro Pavan, Director of Graduate Placement, will be holding an introductory meeting on Wednesday, September 25 at 5:00PM in room 3301 for students planning to be on the job market.

The Department has longstanding procedures and deadlines to ensure that vitae and job market packets are prepared on time. Students who intend to be on the job market can view the document outlining these arrangements on our website in the "Graduate > Degree Requirements and Goals > Goals for Dissertation Year Students" page.

Graduation Rates

The first table shows the percentage of each class making it to completion of first year (ie., taking the preliminary examinations), passing all of the preliminary examinations, defending a dissertation prospectus, and completion of the Ph.D.

Class	First Year	Prelim exams	Pros-pectus	Ph.D.
2003	92%	83%	83%	71%
2004	100%	77%	69%	65%
2005	88%	77%	73%	73%
2006	88%	73%	69%	65%
2007	96%	86%	79%	75%
2008	89%	85%	81%	74%
2009	100%	85%	77%	69%
2010	96%	81%	67%	63%
2011	90%	85%	75%	70%
2012	100%	90%	90%	81%
2013	97%	90%	83%	69%
2014	100%	88%	71%	na
2015	95%	80%	75%	na
2016	96%	77%	na	na
2017	93%	87%	na	na
2018	100%	88%	na	na

For the 251 students entering in the ten-year period between 2003 and 2012, on average 94% completed the first year, 82% passed all prelims,

76% defended a dissertation prospectus and 71% received a doctoral degree. Three (1%) of these students are still registered and may yet obtain a Ph.D.

The second table shows the time to completion for students entering between 2003 and 2012. Completion is based on the date that the degree was awarded, which may be up to a year from the time that the student left Northwestern to take up a job. The mean is 5.94 years, and the median is 6 years. However, 27% of our graduates completed in five or fewer years.

Duration	Number of Students
4 years	3
5 years	45
6 years	103
7 years	16
8 years	7
9 years	2
10 years	1

Notes

Office Allocations

The carrel selection process was completed in August. Students will move between now and the start of classes. You will have received an email detailing how you can pick up metal keys and when the access lists for rooms with electronic access will be updated.

The carrel rooms contain small lockers that function in the same way as a hotel safe. Users select a 4 to 8 digit code. Instructions can be found on “Graduate > Current Student Resources” page of our web site. First year students using the locker room (3486) have to provide their own padlock(s).

Keys

If you are having problems with your Wildcard accessing electronically-controlled exterior and wing-entry doors in the building, please see the Business Administrator. If you lose your Wildcard you need to contact the Wildcard office.

If you lose the key to your office door key or the key to your carrel drawers, we will charge a \$15 replacement fee for each.

Instructions for Using the Computer Lab

This is information primarily for first-year students. When using the computer lab (room 3418), you will initially find a Windows log-in screen. You need to use your NU NetID and password.

Note that you should save your personal files on an external drive or a network drive, and not on an individual machine’s hard drive. The latter is a very risky strategy, as any software updates will overwrite all of the existing memory, and the hard drives are not backed up.

Instruction for printing is to the copiers in room 3320 from either the lab computers or by downloading drivers to your own personal computer are posted on the “Graduate > Current Student Resources” section of our website. Your usercode is your 7-digit NU student ID number. You can also use this code to make walk-up copies on the copy machines.

Graduate students are given an allowance of 500 copies/prints per calendar month. You will be billed each month at 6¢ a page for any excess above 500.

First Year Group Meeting Rooms

There are six rooms assigned as group meeting rooms for first year students (3192, 3196, 3478, 3482, 3488 and 3494). We do not have a formal booking system in place for

these rooms, but could introduce one if problems emerge. Currently usage is based on first come – first served. It is inappropriate for groups to lay permanent claim to a specific room. Belongings should not be left in the rooms when not in use. Lockers are provided in room 3486 for storage.

E-mail Group Mailing Lists

The Department has four group mailing lists. The group mailing list for graduate students is:

<econ-grads@northwestern.edu>. There is also a list called <econ-1stys@northwestern.edu> which is for first year students. Do not mail to both of these lists as the second is a sub-set of the first.

Note that these are “closed” lists to avoid spam postings. To post to the lists you must use your @u.northwestern.edu e-mail address. Mail from other addresses (e.g. gmail) will be automatically rejected.

Coffee Machine in Pantry

There is a Nespresso coffee machine in the pantry that can either brew espresso or regular coffee. The machine requires capsules that are sold in boxes of 50 for \$35.00 (70¢ a cup). The order form can be linked to from the “Graduate > Current Student Resources” page of our web site.

The form and a check payable to “Northwestern University” should be given to the staff in our main office. Orders are placed at noon on the first business day of the month.

Next Graduate Connection

Volume 25, number 2 will be published on December 3.

Short Course for Faculty and Graduate Students



From Discrete- to Continuous-Time Models in Economics, and Back Again

David Kreps

Stanford University

Holder of the Erwin Plein Nemmers Prize in Economics

INTRODUCTION AS PART OF THEORY “BAG LUNCH” SEMINAR

THURSDAY OCTOBER 24, 12:15-1:15, KELLOGG GLOBAL HUB, ROOM 4302

SHORT COURSE

MONDAYS AND WEDNESDAYS, OCTOBER 28, 30, NOVEMBER 4, 6, 11, 13, NOON-1:30PM

KELLOGG GLOBAL HUB, 2211 CAMPUS DRIVE, ROOM 3301

Over the past decade, a literature has developed in which continuous-time models, employing Brownian motion in one form or another, are advanced. These models provide considerable advantages over discrete-time models, most notably the ability to give closed-form solutions. However, continuous time and, more particularly, Brownian motion, are tricky. One would like to know that the “answers” obtained in “nearby” discrete-time models “approximate” the answers obtained in the “limiting” continuous-time model, where the scare-quotes around answers, nearby, approximate, and limiting indicate that the research agenda here is to give precise and formal meaning to each of these terms.

The short course will undertake a case study of these issues: For the limiting continuous-time model of financial markets studied by Black and Scholes and by Merton, which discrete-time process models give asymptotically the same economic answers? The classic paper by Cox, Ross, and Rubinstein suggests that one answer is a model based on a discrete-time, binomial random walk. But is that true? (For the most part, yes, but you have to be precise in what does and doesn’t work.) And is that all? (Not hardly.)

TEXTBOOK: The text for the short course is the just-published Econometric Society Monograph, *The Black-Scholes-Merton Model as an Idealization of Discrete-time Economies* (Cambridge University Press, 2019). (I’m not sure of the release date for this book in the US. Students should check on Amazon.com and email me at kreps@stanford.edu if it doesn’t seem to be available by the start of the course.) The monograph will be supplemented by some research papers, to be supplied.

PREREQUISITES: The course will cover the necessary basic theory (chapters 2 and 3 from the monograph), but participants should ideally have a good working knowledge of Radner’s equilibria of plans, prices, and price expectations, with a focus on Chapter 16 in Kreps, *Microeconomic Foundations, I: Choice and Competitive Markets* (Princeton UP, 2012), especially Proposition 16.8 there, as well as an acquaintance with Brownian motion and stochastic integration.