

**Princeton University  
Department of Economics**

## **The Economics Senior Thesis**

# **Class of 2016**

A resource for Economics majors containing guidelines, requirements and deadlines  
for Senior Independent Work

Copies of this Program and more Senior Thesis information may be downloaded from the Economics Department  
website: <http://economics.princeton.edu/undergraduate-program/senior-independent-work/>

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PRINCETON UNIVERSITY Department of Economics  
UNDERGRADUATE PROGRAM

**CLASS OF 2016 SENIOR THESIS CALENDAR 2015-2016**

**Thursday, September 24, 2015**

7:30pm-8:30pm., **Dodds Auditorium**, Meeting for all Seniors

**Friday, October 02, 2015**

Thesis Proposal/Advisor Request Form due to Undergraduate Program Manager, 005 Fisher Hall

**Monday, October 12, 2015**

Advisor assignments posted online

**Friday, October 30, 2015**

Deadline to request thesis funding for fall semester

**Friday, December 04, 2015**

Submit thesis outline and bibliography to your advisor

**Friday, January 7, 2016**

Deadline to request data not held at Princeton University. See Bobray Bordelon, Economics Librarian

**Friday, February 26, 2016**

First Draft of thesis due to advisor

**Monday, February 29, 2016**

Deadline to request thesis funding for spring semester

**Wednesday, April 13, 2016 THREE COPIES OF THESIS (one hard bound copy, one soft bound copy, and one electronic), and all senior exit forms, due *BEFORE* 4:00PM to Undergraduate Program Manager, 005 Fisher Hall.**

## **General Comments about Economics Research:**

Economics research can be organized in several ways. The three main branches of economics research are: macroeconomics which provides the language and tools for analyzing aggregate economic outcomes; microeconomics which offers a framework for studying the interaction among individuals/organizations and the role incentives and information play in these interactions; and econometrics which develops tools for confronting macroeconomic and microeconomic theories with data.

The smaller areas within the branches listed above are called fields. Examples of fields are monetary economics, international finance, industrial organization, public finance, finance, labor economics, health economics, development economics, political economy, behavioral economics, experimental economics and international trade. Most fields fall under one of the main branches, typically macro or microeconomics. Some fields straddle multiple branches, (e.g. finance) others have their own unique features that make it difficult to classify them as macro or microeconomics (e.g. experimental economics). Roughly speaking, branches can be identified with the required courses for an Economics major and the titles of departmental courses correspond to (or identify) the fields.

Another and perhaps more useful way to organize economic research is by methods. Most research in academic economics and the vast majority of senior theses in economics are *empirical*. That is, the authors of these papers work to identify and quantify relationships among economic variables by applying econometric methods to data. Alternatively, economic research can be *theoretical*. Researchers in economic theory develop models that are abstractions of economic behavior (of, for example individuals, groups of individuals, or firms) and their interactions (in, for example, markets, political interactions, elections, bargaining). Some empirical work is closely tied to a particular theory. Many of the variables in the empirical models represent the ones that appear in the corresponding theory and the empirical relationships themselves mimic the relationships that the theory identifies. Most empirical papers however, measure relationships that are informed by one or more theories but are not specifically tied to a particular model. Some empirical papers, including some senior theses, measure the relationship among economic quantities without any guidance from theoretical work. Finally, some economics papers (and a small number of theses) are *experimental*. These papers analyze the behavior of subjects engaged in a structured economic activity. Experimental papers tend to involve simpler econometric techniques. The challenge in an experimental paper is in identifying an interesting question and designing and implementing the suitable experiment to address it.

If you look at titles of economics research papers, you will notice an impressive range which includes “An Analysis of the Effects of Energy Subsidies on Carbon Dioxide Emissions from Electricity Generation,” “Pinocchio’s Pupil: Using Eye-Tracking and Pupil Dilation to Understand Truth-Telling and Deception in Games,” and “The Wizard of Oz as a Monetary Allegory.” What makes all of these papers economics? What is common to economic research? What distinguishes economics research from research in the other biological and social sciences and humanities? A precise and complete answer to these questions is impossible and fortunately not necessary. It is enough to know certain common features of economic research papers and certain attitudes or values that economists share. Without any pretense at being exhaustive or of a reflecting a consensus, here is a list of such criteria:

- (1) Economics is quantitative. Numbers matter, measurement is key. In this sense, “The Wizard of Oz as a Monetary Allegory,” is probably not a good topic for an economics paper. Not surprisingly, it has not led to a vast literature.

- (2) Abstraction is permitted and valued. For example, GDP, sunk costs, utility, consumers' surplus, risk, and externality are neither the simplest concepts nor the most intuitive ones; yet they are central to economic analysis because they identify important economic categories or reflect useful compromises between what is of interest and what can be measured.
- (3) Agency matters. Economic outcomes emerge from choices that result from the interaction of individual preferences and individual and institutional constraints. Things happen because an individual or a group of individuals make them happen. In many cases, as you would expect, the individual is the agent of interest. In others, the firm is the agent of interest, either in its entirety or the various departments within the firm. The appropriate choice of agent depends on what questions you want to ask. If you are studying international trade, one agent could be an entire country. One key to economic research is identifying the right agent. One thing is clear, "we as a society," "humanity," "ideas," are not suitable agents for any economic analysis.
- (4) Arguments should be clear, logical and whenever possible formal. A beautiful paragraph of prose is nice but does not substitute for a logical flaw in an economics paper.
- (5) Economic research offers positive results not normative judgments. However, in the introduction or better yet, in the conclusion of a paper an author may consider some of the normative motivations and implications of her analysis. Often, the analysis indicates some advantages or disadvantages of a particular policy. However, an economic research paper typically isn't about identifying or defining what is good or what is fair. Introductory economics texts often state that economics can be divided into normative and positive economics. This is extremely misleading since what these books describe as normative economics is something you are unlikely to encounter in any top economics journal. One old textbook describes normative economics as follows: "*Normative economics involves ethical precepts and value judgments ... These issues can be debated, but they can never be settled by science or appeal to facts. There are no right and wrong answers to these questions because they involve ethics and value judgements rather than facts.*" (Samuelson and Nordhaus (1990)). The last sentence offers the best description of what is not a good topic for an economics research paper.
- (6) The tone should be detached, (unemotional) and analytical. A research paper in economics is not a polemic or a call to action. No matter how strongly the author feels about the issue overall, within a research paper, she should only offer positive arguments and facts. Whether she feels strongly or genuinely about the issue or is undertaking the project purely as an intellectual exercise is irrelevant.

There are three learning goals of the thesis experience that reflect the six criteria above. First, through their work on the thesis, seniors are expected to command the *methods* suitable for their topic. For an empirical thesis, this means seniors should not only understand the relevant econometric techniques but also show awareness of the limitations of those techniques both in general and in the context of their own work. Theoretical work should display an understanding of how to construct a model, how to manipulate it and how to draw conclusions from it. Experimental work should reveal an understanding of current experimental protocols and their rationale. Second, students should command the relevant literature. That is, they should be able to place their own work within the field (or subfield) so that the marginal contribution of the work is clear. They should also be able to relate the methods used to those of others in the same field or, when appropriate, different fields and know the relevant historical or institutional background. Finally, students should learn to write economics in a *style and tone* that reflects current conventions and preferences. Being able to identify a "fashionable" topic is useful, but an up-to-date treatment of the topic is essential. The tone should be factual and detached. The author may express the normative implications of her analysis but should do so without becoming an advocate. She should also identify and state the limitations of and possible difficulties with her broader conclusions.

### Preparing for and Writing a Senior Thesis:

The key preparation of the economics senior thesis is the Junior Independent Work (JIW) in economics. The JIW provides students with an opportunity for a “supervised trial run” for the senior thesis. As compared to the senior thesis, the JIW represents a more modest project and offers more extensive guidance for the students. As a part of the JIW, students are required to attend a year-long, structured series of lectures, statistical and writing workshops, group and individual meetings. Unlike the senior thesis, a significant part of the JIW final grade is determined on the basis of work other than the final paper (i.e., prospectus, draft, attendance and participation.) The group meetings are organized along fields and methods as outlined in the previous section and reflect the interests of the current group of juniors. Typical fields covered by the JIW groups might include (often in combination) (1) Environmental economics and Applied Microeconomics, (2) Finance, (3) Macroeconomics, (4) Corporate Finance, Asset Pricing and Industrial Organization, (5) Labor Economics, (6) Econometrics, (7) Law and Economics, (8) Health and Family Economics, (9) Public Economics, (10) International Economics, (11) Macroeconomics, (12) Finance.

There is a final information session for all JIW participants on planning for the senior thesis at the end of the spring semester. A tentative theme/data proposal is prepared and the JIW faculty director forwards those to Bobray Bordelon at Firestone Library. This way, during the summer, rising seniors can get feedback on whether the data they require are available. The JIW director also informs students planning to conduct their own surveys about IRB issues.

Other than completing their JIW, students can prepare for their senior thesis by working with faculty over the summer, studying senior theses of former seniors (available online) and reading journal articles as a part of their background study for the senior thesis.

### Reminders:

Please read this program carefully before you see your thesis advisor. This information and more is available in the “Undergraduate” section of the Department website at: <http://economics.princeton.edu/undergraduate-program/senior-independent-work/>

**The Thesis is due on Wednesday, April 13<sup>th</sup>, 2016 before 4:00 pm.**

There are **never** any extensions given for **any reason**. A departmental committee assesses penalties, and the department has adhered firmly to the doctrine that fairness **requires rigid adherence to the submission deadline, including the 4:00 pm deadline**. Grade reductions have been quite severe in the past. The penalty committee may consider mitigating circumstances submitted in writing with the late thesis, but the committee rarely reduces the penalty as a consequence of the excuse. **Get your thesis in on time**. The penalty scheme more than covers the expected improvement in a student’s grade resulting from the extra days taken to submit it. You have almost seven months until the due date. That is more than enough time for the production of a first-rate thesis.

### Choosing a Topic

A first-rate thesis in economics is either an empirical paper or a theoretical paper or a combination of both. This means that you will either collect/acquire/organize and analyze data or you will build/modify/find and study a model (or both). A small fraction of seniors do experimental work as their theses. Such theses tend to have both an empirical and theoretical component.

The most important step in choosing a topic is deciding whether you will write an empirical thesis or theoretical thesis. You should look at some theses from previous years to understand what an empirical and/or theoretical thesis entails. Here are a few questions to consider as you choose your topic:

What economic variables will I study? How are these variables measured? (Relevant for both empirical and theoretical theses.)

What work has been done on this topic so far?

Will I be able to find data? What econometric techniques will I use? (Empirical)

What kind of model will I study? E.g., Game-theoretic, competitive equilibrium, non-competitive equilibrium, decisiontheoretic/behavioral? (Theoretical)

What experiments will I run?

One way to understand what a thesis entails and to figure out what kind of thesis you want to write is to review some theses from previous years (available online at the Department website) and to evaluate them for yourself. Was the thesis empirical or theoretical? Was it successful? Did it look like the kind of work you would like to do? Do you need to adjust your course selections for this semester to better prepare yourself for writing your thesis? Can you do the analysis in a reasonable length of time? (Use **at least two months of full-time** effort as your estimate of time available.)

Make use of the resources and staff available in Firestone Library. See <http://library.princeton.edu/econlib>. The staff includes Bobray Bordelon (Economics & Finance Librarian/Data Services Librarian, A-13-J-2 Firestone), Todd Hines (Assistant Economics, Finance, and Data Librarian, B-13-P-2 Firestone), and Phebe Dickson (Industrial Relations/Labor Economics Librarian, A-13-H-2). The Data and Statistical Services Group in Firestone (<http://dss.princeton.edu/>) has consultants who can help with data preparation, analysis, and statistical software. The consultants are Ofira Schwartz-Soicher (A-12-F-2 Firestone) and Oscar Torres-Reyna (A-12-F-1 Firestone). See the Mudd Manuscript Library for previous years' theses. **Please note that there is a deadline of Friday, January 8<sup>th</sup> to request data not held at Princeton University. Contact Bobray Bordelon (ext. 8-3211 or [bordelon@princeton.edu](mailto:bordelon@princeton.edu)) as soon as possible.**

### Advisor/Advisee Assignments

Your Thesis Proposal/Advisor Request Form is due on Friday, October 2, 2015, by 4pm. Please submit your form to Noelina Hall, the Undergraduate Program Manager, 005 Fisher Hall. After having received your request form, you will be assigned an advisor by the faculty member overseeing senior independent work. The person doing this in 2015-16 is **Professor Henry Farber**. You must request an advisor to have one assigned. Professor Farber will consider your topic and advisor request when making the final assignments. **Principally because some faculty advise a small number of theses, some students will not be assigned a requested advisor or will receive an advisor who is not primarily an expert in the student's area of research interest. Please understand that a perfect match is not always possible. All faculty advising theses can guide the student through the process of writing a thesis with sound economic reasoning. All students are encouraged to seek advice and information from other faculty members with expertise in their research area.** Student/Advisor assignments will be posted on Monday, October 12, 2015.

Some seniors develop a working relationship with a faculty member who agrees beforehand to supervise their thesis. If a faculty member agrees to advise you, have him or her (1) provide a confirming statement and signature directly on your advisor request form and (2) send a confirming e-mail to Noelina Hall, the Undergraduate Program Manager ([noelina@princeton.edu](mailto:noelina@princeton.edu)). **These agreements can only be assured if Ms. Hall is notified before undertaking the advisor/advisee match (i.e. before Friday, October 2, 2015).**

We do not object to mutually agreeable exchanges of advisors between students. By “mutual,” we mean that all parties (students and faculty) agree to the trade. Please have the relevant advisors notify (by e-mail) the Undergraduate Program Manager ([noelina@princeton.edu](mailto:noelina@princeton.edu)) of any such trades.

Though it is rare, you may discover that you and your advisor are incompatible. If you cannot arrange a suitable trade, please make an appointment to see Professor Farber before the end of October to discuss obtaining a new advisor (not always possible). Please do not try to work on an unsupervised thesis. Note, however, that **changing advisors is not feasible after November 6th.**

In extremely rare circumstances, an advisor turns out to be totally unhelpful. If this happens to you, don't panic. Discuss the problem with Professor Farber, who will try to arrange some alternative or additional help. Do not leave this until it is too late in the academic year.

### **Your Advisor and Your Schedule**

Writing a senior thesis requires neither constant supervision nor complete independence. Opinions as to how much guidance an advisor should provide differ greatly among advisors (and seniors). Hopefully, over time, you will find out where the optimum is for you and your advisor. It is crucial that your advisor likes your approach and output. To achieve this outcome, it helps to follow his recommendations. If you disagree with your advisor, it can be fruitful to discuss your differences. However, you are not required to follow every recommendation.

Once you find out who your advisor is, **see him/her as soon as possible.** The following schedule should give you a general idea for your time management after you have made contact with your advisor. It is always a good idea to be ahead of schedule so that you can respond flexibly to unexpected difficulties and problems (and there are **always** unexpected difficulties). **If you are late in getting your work to your advisor, you cannot expect him/her to give you timely feedback.**

- 1) Settle on a topic in consultation with your advisor — **ASAP**
- 2) Read background material
- 3) **Complete a proposal (including outline, bibliography, primary sources, main modeling idea etc.) and submit it to your advisor by December 04.**
- 4) **Complete the bulk econometric work or modeling and first draft. Submit it to your advisor before the end of the first week in March (absolutely the latest!)**
- 5) **Submit *three copies* of your thesis (one hard bound, one soft bound and one electronic) and all senior exit forms *before 4:00pm* on Wednesday, April 13, 2016 to 005 Fisher Hall.**  
(Allow adequate time for binding.)

**Do not expect your advisor to read drafts overnight.** In general, if you give him/her adequate time to read drafts, you will get good feedback on your work. **Give yourself adequate time to respond to your advisor's comments.** Remember, your advisor is not just a grader but also someone who is willing to help you write a better thesis. Take advantage of this; don't surprise your advisor with the finished work. Make sure you know what she/he thinks of your work long before the final version is due.



## Extensions and Penalties

The penalty for submitting your outline or draft late is the following: your advisor may not be able to respond to your questions and give you adequate feedback in time. As a result, you will not be able to correct and improve your work.

The penalty of submitting the final version of the thesis late is one-third of a letter grade for a submission that is up to one day late and two-thirds of a letter grade for a submission that is two days late, with greater penalties for later submissions as determined by faculty committee. **Your advisor cannot grant extensions of time** and extensions are granted only in very rare (i.e., almost never) circumstances. Neither time pressure from other academic or extra-curricular commitments, nor computer or printer problems are sufficient grounds for grants of extra time. Be sure to budget your time prudently.

## Academic Infractions and Academic Fraud

A senior thesis which contains academic infractions or which is in any way the result of academic fraud **will automatically receive a failing grade**, independent of the result of disciplinary action. Please be sure to cite correctly, and to give proper credit to other authors for their ideas and language. The university has severe restrictions and rules on how much the content of the JIW and the Senior Thesis can overlap, the manner in which the Senior Thesis can develop ideas and methods developed in the JIW, and how students should cite their own JIW. Please consult the senior thesis coordinator, Professor Farber if you suspect that the topic, ideas or content of your JIW and Senior Thesis may overlap.

## Grading Standards and Practices for Senior Thesis Research in Economics

### **A. How your thesis will be assessed**

- Your primary advisor and the senior thesis committee will grade your thesis. Each will give the thesis a number grade between 0 and 100. The scale is 97-100 A+, 93-96 A, 90-92 A-, 87-89 B+, 83-86 B, 80-82 B-, 77-79 C+, 73-76 C, 70-72 C-, 60-69 D, below 60 F.
- If the two readers' grades are within 6 points of each other, then your final grade will be the weighted average with 1/3 weight to the advisor and 2/3 weight to the committee reader.
- If the two readers are 7 or more points apart, then the committee will resolve the conflict.
- The numerical average is converted back to a letter grade. You will receive only the final letter grade and copies of all reports without individual grades.

### **B. Evaluation criteria**

**1. Question or Problem.** A well-defined question or problem that requires economic analysis (empirical or theoretical) should be posed and answered.

**2. Understanding of the Literature.** The author should demonstrate command of the relevant literature and place her/his work in the context of this literature.

**3. Methodology and Results.** Empirical work should have (1) a clear statement of the hypothesis or hypotheses, (2) a clear statement of the empirical strategy, (3) a detailed description of the data set, and (4) a clear presentation of the empirical results. Theoretical work should have (1) a model, (2) statements of the results, and (3) proofs (or numerical analysis) that establish the results.

#### 4. Presentation:

**a) Structure.** The thesis should have a format that is consistent with the conventions of economics. A reader should be able to identify sections that typically occur in papers in the economics/finance literature.

**b) Style.** The writing should be clear and concise. The thesis should read like a typical journal article in economics/finance.

**c) Source Citations.** A citation style found in the economics/finance literature – for example the APA style or the style used in the *American Economic Review* should be used.

#### C. Grading Rubric

Grade	Range	Description
A+	97-100	The thesis either (1) fully meets most of the criteria above and has no major deficiencies or (2) has some deficiencies but makes a novel contribution to the Economics literature. An A+ senior thesis is a paper that with some additional work could lead to a publication in a field journal
A- to A	90-96	The thesis is adequate or better than adequate with respect to the above criteria. An A thesis is one that could represent work that is beyond what an undergraduate might reasonably be expected to complete with two solid months of work. In contrast, an A- thesis is one that exactly meets expectations. Not novel enough to qualify as publishable research but reveals the author's command on various economic/econometric methods important for conduction of such research.
B- to B+	80-89	The thesis represents good, solid work despite some significant deficiencies.
C- to C+	70-79	The thesis has major flaws and represents work that is significantly below what is expected.
D	60-69	The thesis reveals virtually no command of economic ideas and tools.
F	0-59	The thesis is unacceptable either as economic analysis or as an essay.

## Formal Requirements

With respect to typing, footnotes, bibliographies and references, buy a copy of Turabian, *A Manual for Writers of Term Papers, Theses and Dissertations*. Use it! The formal requirements are:

1. A title page (see example attached)
2. A detailed table of contents
3. A complete bibliography
4. Adequate documentation of footnotes so that source material can be found. Footnotes should be placed at the bottom of the page. Parenthetical references are acceptable.
5. You must sign the honor-code pledge at the end of the thesis.
6. The manuscript must be typewritten, double-spaced, single-sided and bound (hardcover) **with title and author on the cover**. Margins should be one inch around except for the binding edge, which should be 1-½ inches.
7. An abstract is optional.
8. **Three copies of the thesis—one hard bound, one soft bound, and one electronic are due Wednesday, April 13, 2016, before 4:00pm.** You must submit **two copies** of your thesis to the Undergraduate Program Manager, 005 Fisher Hall, *before 4:00pm. Do not submit the copies to your advisor; do not put them in your advisor's mailbox.*
9. Please remember to number the pages.
10. All economics senior exit forms must be submitted with your thesis to complete your submission. Only complete submissions will be accepted.

There is no explicit length requirement for the thesis. However, almost all theses that are significantly longer than 80 pages could benefit from being shortened, either by presenting the same material more concisely or by narrowing the focus of the thesis. The typical thesis is between 50 to 80 pages long. Theoretical theses tend to be much shorter than 50 pages. Efforts to “pad” a thesis to make it seem longer, by including either irrelevant graphics or using an abnormally large typeface and margins are both transparent and unlikely to be effective.

Please be sure that your valuable computer files are backed-up. A hard drive failure or corrupted storage media will not excuse a late submission.

## Thesis Funding

Funding is available for research expenses. To be considered, students should submit an application through [SAFE](#).

## Prizes

The following prizes will be awarded by the Department of Economics this academic year:

**The Wolf Balleisen Memorial Prize**: An annual prize for the outstanding thesis by a senior in the field of economics.

**The John Glover Wilson Memorial Award**: Prize awarded for the best essay on international economics or politics by a student in the Department of Economics.

**The Walter C. Sauer Prize**: An annual Prize awarded to the student whose thesis or research project on any aspect of U.S. foreign trade is judged most creative. Joint eligibility between Economics, Politics, and WWS.

**The Daniel L. Rubinfeld '67 Prize in Empirical Economics**: Awarded annually for the best thesis in empirical economics.

**The Senior Thesis Prize in Finance**: Awarded to the most distinguished senior thesis in the area of finance.

**The Senior Thesis Prize in Economics**: Awarded annually for the best thesis in Health, Education, or Welfare.

**Halbert White '72 Prize in Economics**: Awarded annually to the most outstanding senior economics major as evidenced by excellence in departmental coursework, and creativity in the junior papers and senior thesis.

Last year's prize winners may be found in the "Undergraduate" section of the Department website under "Senior Thesis Prizes and Winners" at <http://economics.princeton.edu/undergraduate-program/senior-independent-work/>. Previous years' theses are stored in the Mudd Manuscript Library; we advise you to look at some prize-winning theses, especially ones related to your research area, to get a better idea of what a good thesis should be.

(Title Page—Senior Thesis)

TITLE OF THESIS

BY

Name of Student

Submitted to Princeton University  
Department of Economics  
In Partial Fulfillment of the Requirements for the A.B. Degree

Date

PLEDGE:

This paper represents my own work in accordance with University regulations.

Signature

PRINCETON UNIVERSITY  
Department of Economics  
Class of 2016

SENIOR THESIS PROPOSAL/ADVISOR REQUEST FORM

**Important Note:** You must submit this proposal form. If you already have an advisor, it must be noted on your proposal form before submitting.

In the space provided below, please describe the project that you intend to undertake for your senior thesis. (State and describe your proposed topic and indicate whether you intend to do empirical, theoretical or experimental work.) This description will be used for assigning you to a faculty advisor, so be as specific as possible. If there are any faculty advisors you would like to request, please list and rank-order their names below.

**Your senior thesis proposal must be submitted to the Undergraduate Program Manager, 005 Fisher Hall, by Friday, October 02, 2015. Assignments will be posted on Monday, October 12, 2015.**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

THESIS TOPIC: (if more space is needed, please continue on back). Before making your requests for particular advisors, consult the list of senior thesis advisors and their interests available at <http://economics.princeton.edu/undergraduate-program/senior-independent-work/>

Advisor Request:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_