

# Graduate Studies in Economics Handbook

University of Arizona



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\* Please feel free to make suggestions to Prof. Gautam Gowrisankaran or Lana Sooter to help improve the information in the Handbook.

## Program Checklist

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<i>First Year</i>	<i>When</i>
<input type="checkbox"/> Graduate Teaching Assistant Orientation	August
<input type="checkbox"/> Submit <a href="#">Master's Plan of Study</a> to Grad. Degree Certification	Second Semester
<input type="checkbox"/> Pass Preliminary written examination	June/August
<input type="checkbox"/> Submit <a href="#">Master's Completion of Degree Requirements</a> to Grad. Degree Certification	Fall or Spring of 2 <sup>nd</sup> Year
 <i>Second Year</i>	
<input type="checkbox"/> Submit <a href="#">Ph.D. Plan of Study</a> to Grad. Degree Certification	Fall Semester
<input type="checkbox"/> Second-year paper and Conference presentation	April
<input type="checkbox"/> Choose a "mentor"	Anytime
 <i>Third Year</i>	
<input type="checkbox"/> Submit <a href="#">Progress Report</a>	February
<input type="checkbox"/> Third-year paper and Conference presentation	March
<input type="checkbox"/> Grade of Pass on third-year paper	May
<input type="checkbox"/> Pass Oral Examination	Spring of 3 <sup>rd</sup> Year or Fall of 4 <sup>th</sup> Year
 <i>Fourth or Fifth Year</i>	
<input type="checkbox"/> Submit the <a href="#">Committee Appointment Form</a> form to Grad. Degree Certification	Upon passing Oral Exam
<input type="checkbox"/> Submit <a href="#">Progress Report</a>	February
<input type="checkbox"/> Prepare Job Placement Packet	October of the Job Market Year
<input type="checkbox"/> Submit <a href="#">Announcement of Final Oral Examination</a> to Grad. Degree Certification	Seven working days prior to the exam
<input type="checkbox"/> Final Oral Defense of the completed dissertation	When Ready

## Becoming a Colleague

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Our fundamental goal in the Economics doctoral program is to transform you into a successful economist. We want to move you from taking courses and exams to developing your own projects and contributing new research to the field. By the time you complete your Ph.D., you will have made a substantial contribution to the field of economics and prepared yourself to continue making contributions in the future.

The program is comprised of several phases. The core courses are the foundation for the program. This is where you will develop your abilities with the analytical tools required to do economics and where you will learn to take an economist's approach to solving problems. ECON 508 and the various 696 courses will take you to the frontier of economic research. The goal of these courses is to help you develop your own research program. The sequence of second-year paper and presentation, third-year paper and presentation, oral exam, and final dissertation defense provide a framework in which to develop your original contributions to the field.

When you complete the program with your PhD, our objective is that you obtain the best possible position as a professional economist. We can help you reach this goal, but the ultimate responsibility is yours. To succeed, you will have to put in several years of dedication and hard work.

Once you get past the coursework and the written preliminary exams in the first year, your success in the profession will largely be determined by your success in research. You don't get a good job based on your ability to take tests. You get a good job based on your ability to identify, develop and complete interesting research projects. From the first day in the program you should begin thinking about what types of topics interest you. Attend the afternoon workshops, get to know the faculty and other students, and learn what they are working on. The paper projects and other program milestones give you a short-term incentive to develop and finish research papers. But the papers are only as good as the amount of work and inspiration that you put into them. We can advise you and help you along the way. In the final analysis, the more you can show that you have developed good projects and are an independent economist with your own ideas and research agenda, the better our ability to recommend you to prospective employers.

The market for economists has become increasingly competitive. To obtain a job these days, you basically have to be within sight of finishing a dissertation at the time you interview at the American Economic Association meetings in early January. Even that is not enough for most positions because each employer (whether university, government or private company) receives hundreds of job applications, each with a dissertation abstract, a promise that the candidate will be done with his or her Ph.D. by the following August, a list of fields, and letters of recommendation saying the person is very good. To be successful on the job market, you need to stand out in some way. The most effective way to stand out is to already have one or two papers accepted for publication and others in the pipeline. Your best bet is to start working on research projects early in the program because it takes time for these projects to develop.

## Official Requirements for a Ph.D. in Economics

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### Required Coursework at a Glance:

Core	24 Hours
Seminars	18 Hours
Workshops	6 Hours
Dissertation	<u>18 Hours</u>
<b>Total</b>	<b>66 Hours</b>

### Core Courses:

Number	Title	Credit Hours	Semester
ECON 501a	Graduate Microeconomics I	3 Hours	Fall/1 <sup>st</sup> Yr
ECON 501b	Graduate Microeconomics II	3 Hours	Fall/1 <sup>st</sup> Yr
ECON 520	Statistics for Economists	3 Hours	Fall/1 <sup>st</sup> Yr
ECON 501c	Graduate Microeconomics III	3 Hours	Spring/1 <sup>st</sup> Yr
ECON 502a	Graduate Macroeconomics	3 Hours	Spring/1 <sup>st</sup> Yr
ECON 522a	Graduate Econometrics I	3 Hours	Spring/1 <sup>st</sup> Yr
ECON 508	Research Methods in Economics	3 Hours	Spring/1 <sup>st</sup> Yr
ECON 522b	Graduate Econometrics II	<u>3 Hours</u>	Fall/2 <sup>nd</sup> Yr
<b>Total</b>		<b>24 Hours</b>	

### Seminar Courses:

Seminar courses are designed to expose you to literature in subfields of economics and to give you an opportunity to explore research projects in those fields. A minimum of two courses in two fields is required to promote a rich and textured understanding of research opportunities within two areas. A list of available fields follows the below example of the seminar course structure.

#### Field One (two courses in the same field)

ECON 696_ (or similar level)	3 Hours
ECON 696_ (or similar level)	3 Hours

#### Field Two (two courses in the same field)

ECON 696_ (or similar level)	3 Hours
ECON 696_ (or similar level)	3 Hours

#### Seminar Electives

ECON 696_ (or similar level)	3 Hours
ECON 696_ (or similar level)	<u>3 Hours</u>
<b>Total</b>	<b>18 Hours</b>

*The following fields are available for Seminar Study:*

- Experimental Economics (696a, 696b)
- Economic History (696x, 696y)
- Industrial Organization and Regulation (696p, 696q)
- Labor Economics (696h, 696i)
- Microeconomic Theory (696r, 696s, 696u)
- Natural Resource Economics (576, 577, see Ag Econ Dept advisors)
- Financial Economics (meet with the Finance advisor)
- Econometric Modeling (696e, 696f)
- Agricultural Economics (see Ag Econ Dept advisor.)

You may also take electives in special topics offered on an ad hoc basis. These electives could be economics courses, or courses offered by other departments such as mathematics, engineering, or psychology.

Specialization in other fields either within Economics or outside of Economics is a possibility subject to the agreement of the Director of Graduate Studies. Students interested in specializing in Financial Economics should consult the graduate director in Finance regarding coursework requirements. Similarly, students interested in specializing in Natural Resources or Agricultural Economics should meet with the graduate advisor in the Agricultural Economics Department.

Most Ph.D. students in our program do a major and minor in Economics, however you have the option of pursuing a minor in another field. The typical minor in another field involves taking a sequence of four courses and passing a minor exam. If you are interested in a minor outside of Economics then you should discuss this with the Director of Graduate Studies.

### **Workshops & Dissertation Credit**

The workshops, designated 697 with a letter following, provide you with an opportunity to get involved in the research life of the Department. Each workshop typically meets once a week from 3:30 p.m. to 5 p.m. and features presentations by external speakers, local faculty, and graduate students. You must take at least two workshops to graduate, but **students in the third year and beyond are expected to enroll in a workshop each semester.** While the exact course requirements depends on the instructor, typically a student is expected to give a research presentation, write research reports on the papers of other speakers, and attend regularly. The workshops provide an introduction to the frontiers of current research and provide a forum in which the student may become comfortable presenting and discussing his or her own research. Additionally, each student must complete 18 hours of dissertation credit.

ECON 697_	Workshop in Economics	3
ECON 697_	Workshop in Economics	<u>3</u>
<b>Total</b>		<b>6</b>

### **Other Requirements**

- Pass the written preliminary exam (theory and quantitative parts)
- Pass the second written preliminary exam in the form of the second and third-year papers
- Pass the oral examination
- Teach two undergraduate courses

## Registration Requirements and Procedures

Department staff will register first year students for classes prior to each semester. Beginning in their second year, students should register for classes through Student Link. If a problem arises, the Undergraduate Coordinator can provide assistance. Beginning in the third year, all students in residence must register for one of the workshop classes (697?) each semester.

In order to maintain full time status, students should be registered for a minimum of nine semester credits each term. Students who have been awarded Graduate Assistantships must be registered for a minimum of six semester credits.

A student admitted to a doctoral program must register each fall and spring semester for a minimum of 3 graduate units from original matriculation until the completion of all course requirements, written and oral comprehensive exams, and 18 dissertation units. When these requirements are met, doctoral students not on financial assistance and/or needing to maintain appropriate visa status must register for a minimum of 1 unit each semester until final copies of the dissertation are submitted to the Graduate Degree Certification Office. Students receiving funding such as assistantships, fellowships, loans, grants, scholarships or traineeships may be required by their funding source to register for more than 1 unit to meet full-time status requirements.

Doctoral students normally do not have to register for graduate units during summer sessions. If degree requirements (including the Comprehensive Exams and the Final Oral Exam) are completed during the summer term, the student must be registered for a minimum of 1 unit of graduate credit during that term. If degree requirements are completed during an intersession (winter session or the Pre-Session), the student must have been registered for a minimum of 1 unit during the preceding semester.

Unless excused by an official Leave of Absence (which may not exceed one year throughout the student's degree program), all graduate students are subject to the Continuous Enrollment Policy and must pay in-state and out-of-state tuition and fees in order to remain in the program. If the student fails to obtain a Leave of Absence or maintain continuous enrollment, he or she will be required to apply for re-admission, to pay the Graduate College application fee, and pay all overdue tuition and fees, including cumulative late penalties. No tuition or registration waivers can be applied retroactively.

There are provisions made for students who need to take a leave of absence. Information for the policies and procedures can be found at <http://grad.arizona.edu/catalog/policies/enrollment-policies/leave-of-absence>.

## Payment of Fees

Payment of registration, tuition, and miscellaneous fees is due the first day of classes! While students receiving graduate assistantships at .50 FTE do not have to pay registration and tuition fees, there are still several miscellaneous fees that must be paid by the first day of classes. It is sometimes difficult to determine how much you owe for these fees because the Graduate College does not enter the total remission until several weeks after the beginning of the semester.

The miscellaneous fees you should pay are:

Information Technology/Library Fee	\$137.50
Student Services Fee	40.00
Arizona Student Association Fee	2.00
Rec Center Bond Retirement Fee	25.00
AZ Financial Aid Trust Fee	28.50
KAMP Fee	1.00
Rec Center Program Fee	3.63
International Student Fee*	75.00

Students can pay their fees through UAccess Student Center (<http://uaccess.arizona.edu>).

\*For International Students Only

## Normal Progress for Ph.D. Students in Economics

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### First Year

You should receive grades of B or better in all of your courses, typically including: ECON 501a, ECON 520, and ECON 501b during the fall semester, and ECON 508, ECON 502a, ECON 522a, and ECON 501c during the spring semester. While the University does not use pluses or minuses in official grades, the Department tracks pluses and minuses internally. A grade of “B minus” in a course usually indicates that a student needs to do significant work to enhance his or her skills to be able to pass the preliminary examination.

Also you should participate in the graduate college assistantship training and the Economics Department’s teaching workshop (ECON 597c) in the fall and pass the accompanying teaching audition in the spring. International students must pass an English Speaking Proficiency test as well (See Appendix II for more information).

A Master’s of Arts degree option is available to students who either leave the PhD. program or wish to obtain the MA while continuing in the PhD program. If you choose to earn the MA, you should submit your [Master’s Degree Plan of Study](#) late in the spring of your first year. Forms are available online at the Graduate College website.

In order to continue in the program you must pass the preliminary examinations in Economic Theory and in Quantitative Methods in the summer following your first year. These exams cover the material in the first-year core courses. A student who fails an exam in June has the opportunity to retake the exam in August.

### Second Year

You should perform well in the second-year coursework, typically including ECON 522b and five 696-level\* seminar courses. Plus, you should choose a mentor during the fall semester to provide career advice and guidance on research projects. The goal of the student-mentor pairing is to provide you with a mentor who is well suited to your program and research agenda. We encourage students to switch mentors if they feel working with another faculty member would be more beneficial. Over the course of the year you should talk to faculty and establish contacts to develop a committee for your oral examination.

A second-year paper will be due in mid-April and should follow the structure of a journal article, describing why the topic is important, the relevant literature, the analysis, and a set of results. This second-year paper serves as part of the written comprehensive examination for the program. Papers will be presented during our annual second-year paper conference.

You should submit two forms to Graduate Degree Certification in the Graduate College: your [Master’s Completion of Degree Requirements](#) (if earning an MA), and your [Doctoral Plan of Study](#). If you have not already done so, you need to pass a teaching audition. Students who receive unsatisfactory teaching evaluations may be asked to pass a second teaching audition.

\* Where the term 696-level seminar is seen, courses of a similar nature and quality from other departments with different numbering systems may be taken.

## **Third Year**

During the fall semester of your third year you should complete your final one or two 696 courses. Additionally, you should enroll in a 697 workshop in both the fall and spring semesters. In the 697 workshops you are expected to present your research to an audience of faculty and graduate students.

In February of the third year, you will file a [progress report](#) that describes what you have achieved so far, including papers written, conference presentations, grant applications, courses taught, etc. The report must be read, commented upon, and signed by your mentor. You should be seeking to present your research at conferences, trying to prepare papers for journals, and seeking funding for your research agenda.

A third-year paper will be due in mid-March and should follow the structure of a journal article, describing why the topic is important, the relevant literature, the analysis, and a set of results. This third-year paper serves as the final part of the written comprehensive examination for the program. Papers will be presented during our annual third-year paper conference.

During the second semester of the third year or the first semester of the fourth year you are expected to pass an oral examination that covers the breadth and depth of the field of Economics. The oral exam in our Department typically starts with extensive questioning on the topic of your dissertation proposal and related research, and then expands over time into the fundamentals of Economics that you must know to complete your research and also to be considered a capable Economist (see page 11 for more information about the oral exam).

## **Fourth & Fifth Year**

Students typically complete a Ph.D. in Economics in five years, though some take only four years. During the fourth and fifth year, you should continue presenting your research in the 697 workshops. If you did not pass the oral exam in the third year, you should make plans to do so in the fall of the 4<sup>th</sup> year.

In February of the fourth year, you will file a [progress report](#) that describes what you have achieved so far, including papers written, conference presentations, grants applications, courses taught, etc. The report must be read, commented upon, and signed by your mentor. The report will be used to evaluate your prospects for funding in the fifth year. Ultimately, you must accumulate 18 hours of dissertation credit before graduating.

In your fourth year you need to be thinking about what your research will look like when you are on the job market in the fifth year. The most important feature of your job market packet will be your job market paper. Therefore, it needs to be in superb shape by the time you get to October of your fifth year. You should be working to have a decent draft of the job market paper in May of the fourth year that you can present to your committee. You can then use the feedback from them to improve the paper over the summer and then fine tune it in September of the fifth year.

In the year you plan to go on the job market you should prepare your job market packet, including a vita, a dissertation abstract and a packet of papers by early October. You should contact the members of your committee to write letters of recommendation and to help you in your job search. You should finish the final draft of your dissertation and defend your dissertation sometime during this year. Plus, you should continue to send papers out for publication and continue to present your papers at conferences.

## **Additional Details on Program Milestones**

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### **Program Teaching Requirement:**

We expect our doctoral students to teach at least two undergraduate courses during the program. In order to be eligible to teach you must go through the Graduate Assistants in Teaching Orientation (GATO), the Teaching Assistants Training Online (TATO), the Economics Department teacher training program, and pass a teaching audition. International students must also attend International GATO. You may be asked to pass a teaching audition a second time at some point during your graduate career.

### **Written Preliminary Examination**

The preliminary written examination in Economic Theory and Quantitative Methods is held in early June following the first year of study. In preparation for the written preliminary examination, students review all of the first-year coursework.

The Economic Theory examination covers the microeconomic and macroeconomic core courses (ECON 501a, 501b, 501c, and 502a). The Quantitative Methods examination covers the statistics and econometrics courses (ECON 520 and 522a). Copies of previous preliminary exams are available for study. Students who fail the examination in June will have the opportunity to retake the exam in August.

### **Second-Year Paper and Conference Presentation**

The goal of the second and third year papers is to get you started on doing original research, while offering you plenty of faculty feedback at the same time. Ideally these papers become part of a portfolio of papers that evolves into a dissertation.

Students are expected to write a research paper during the second year of the program. The paper will typically be due in the second week of April. You will then present the paper to faculty and fellow students during the annual second-year paper conference.

The paper should resemble a journal article. It should describe the topic, why the topic is important, discuss the analysis, provide results, and offer conclusions. In particular, empirical paper should discuss the sources of data, estimation techniques and contain a set of estimation results. Experimental papers should discuss the objective, instructions and results of an actual experiment. Theoretical and applied theory papers should develop a theoretical model and include clear, precise statements and proofs of results.

You will be assigned two faculty referees for the paper conference. You will be asked to suggest faculty referees but the final choice of referees will rest with the faculty. The choice will be made known to students before the paper competition. You are also encouraged to talk to faculty members to ask them if they would serve as referees. It is anticipated that faculty referees are likely dissertation advisors.

The best paper is awarded the \$2,000 Steven Manos Prize for the Best Second-Year Paper by a Doctoral Student. The recipient of the prize is determined by the Department faculty, based upon the originality of the research idea, the execution and completeness of the project, and the quality with which the ideas are communicated.

### **Third-Year Paper and Conference Presentation**

In the Spring of the third year in the program students are expected to submit a third-year paper. The paper should be different from the second-year paper, although the topics of the two papers can be related. For instance, if the second-year paper was a preliminary study of a very ambitious topic, the third-year paper may be a much more complete version of the second-year paper.

The third-year paper, like the second-year paper, should resemble a journal article. Expectations are, however, significantly higher for the third-year paper. You should strive to write a paper that is publishable within a couple of revisions. Students are strongly encouraged to consult regularly with faculty in their major field about this paper starting early in their third year.

You will present the paper to faculty and fellow students during the annual third-year paper conference. As with the second-year paper, there are faculty referees. The faculty referees are chosen with the same process as the second-year paper but have a more involved role. The faculty referees will read the paper, attend the paper presentation, assign a grade for the paper and provide detailed written feedback. Grading will be based on the following criteria: originality of research idea; execution and completeness of project; and communication of ideas. There are three possible grades: Pass, Pass with Revisions and Fail. The grades will be determined by consensus by the two faculty referees. A grade of "Pass with Revisions" will come with a detailed set of revisions that you must execute in order to pass the paper. You will then be responsible for updating the paper and resubmitting it to the referees for approval and conversion to a grade of Pass.

Students who fail the paper may petition the faculty to consider a different paper, which must meet the same standards in order to pass.

The \$2,000 Edward E. Zajac Prize for the Best Research Paper by a Doctoral Student will be awarded for the best third-year paper. The Prize is decided using the same criteria as the Steven Manos Prize.

### **The Oral Examination and Dissertation Proposal Defense**

Students are expected to pass the Oral Examination during the second semester of the third academic year or the first term of the fourth year in the program.

The Oral examination committee will consist of a minimum of four voting members, all of whom are tenured, tenure-track or have been approved by the Graduate College as special members. The examination committee need not be the same as the dissertation committee. You should choose the four faculty members in conjunction with the Director of Graduate Studies and the faculty member who will chair your Oral Committee. Committees are approved by the Department and the Graduate College.

All members must be in attendance for the entire exam which should be at least one hour in length, but not exceed three hours. Students should expect the typical length to be roughly an hour and a half to two hours. In order to pass the exam, there can be no more than one negative or abstaining vote. Students who fail the oral exam will be allowed a second chance to retake the exam after three months have passed. The Graduate College allows no more than one retake of the oral exam.

Prior to completing the Application for Oral Comprehensive Examination form, you must make arrangements with Department Staff for a room and use of Department equipment (e.g. projector and laptop). You should not assume that the department seminar room (401KK) will be available. Additionally, you must be registered in the semester the examination takes place. If the date of the exam occurs after the end of the spring semester or before the first day of classes in the fall semester, you must be registered in at least one semester credit for one of the two summer sessions.

Prior to the exam, you must give the faculty member a copy of your dissertation proposal, copies of papers unrelated to the dissertation that you have written, and a description of your coursework at least two weeks before the proposed exam date. You will also complete the [Results of the Oral Comprehensive Examination for Doctoral Candidacy](#). Fill in all applicable information and bring it to the Graduate Program Coordinator to complete written examinations results and obtain the Department Chair's signature (this should be done well in advance of the test date to ensure getting the Department Chair's signature).

**In the Economics Department the Comprehensive Exam requirement is fulfilled by the second-year and third-year papers; therefore, the official date of the Comprehensive Exam is the date on which you turned in your third-year paper.** The rare student who has progressed to the dissertation stage prior to the third-year paper conference should use the date on which he or she turned in the second-year paper.

On the day of the exam take the form to the exam and give it to the committee chairman.

The dissertation proposal should contain:

- 1) An introduction, overview, and outline of the entire dissertation.
- 2) A relatively polished chapter with results.
- 3) A second chapter that still needs more work but shows that the student is relatively far along in the research.

In the Oral Examination you are expected to show both the depth and breadth of your knowledge of the field. The typical oral examination in the Economics Department involves the following steps. You should expect to present a 10 minute overview of your dissertation proposal that briefly touches on all aspects of the thesis. To aid in answering questions, you may also wish to prepare overheads for key tables. The faculty members will have read the materials included in the dissertation proposal, so there will be no need for detailed slides on the papers. This is not a workshop presentation of the dissertation research. The format of the Oral Examination will revolve around you answering the committee's questions. The questioning starts out by focusing on your dissertation proposal and the economic issues related to the proposal. The questioning will expand to address the fundamental knowledge that you must have mastered to complete your research in the field and the general knowledge that professional economists should know.

In assessing the Oral Examination, faculty are looking to see that you are making good progress in developing your research agenda, that you have the requisite knowledge and the capability to pursue your research goals, and that you have a working knowledge of Economics. The oral exam also gives the committee the opportunity to discuss the merits of the work already done, possible improvements to the work so far, and the remaining work to be done to complete a dissertation.

After passing the Oral Examination you will be "Advanced to Candidacy". At this time the Graduate College will assess several one-time fees. Your next step will be to submit the [Committee Appointment Form](#) which must be filed at least six months prior to your Dissertation Defense.

### **Final Dissertation Defense**

Having filed your [Committee Appointment Form](#) at least six months prior to the Oral Dissertation Defense, you must then file the [Announcement of Final Oral Examination](#) at least **seven** working days prior to the defense date.

Prior to completing the Application for Oral Comprehensive Examination form, you must make arrangements with Department Staff for a room and use of Department equipment (e.g. projector and laptop). You should not assume that the department seminar room (401KK) will be available. Once you have obtained the signatures of your committee members, give the form to the Graduate Program

Coordinator. S/he will obtain the Department Chair's signature and forward the form to the Graduate College.

The dissertation committee is composed of a minimum of five faculty members, including a chair, two major faculty and two minor faculty..All five members must agree that the dissertation is sufficiently ready for the defense. Only three of the five committee members have to attend the final defense; two of the faculty may waive attendance. Only the members who will be present at the defense will be listed on the Announcement of Final Oral Examination.

**You must be registered to defend!** To defend during the Fall or Spring semester, you must register for a minimum of three graduate units. To defend in the summer, you must register for one unit during either of the summer sessions. These unit requirements are the same for the semester in which the final dissertation is submitted.

During the final defense, the candidate presents the dissertation to the committee members who offer comments on the material. The committee may decide that the dissertation is complete and sign the dissertation at that point, acknowledging this fact. They may decide that the dissertation needs some minor revisions that will be examined only by the chair of the committee. Or they may decide that the dissertation needs major revisions that must be examined by all members of the committee.

Preparation of the dissertation follows the Graduate College format and style rules. Refer to the [Manual for Electronic Theses and Dissertation](#) on the Graduate College Website.

## Organizing a Research Paper in Economics

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- *Model One: Applied paper*

Introduction– Describe the issue and why it is an important area to study.

Literature Review – Survey the existing literature on the issue and describe why your contribution extends the literature or fills gaps within the literature.

Model– Develop the model that you will use to analyze the issue and derive the implications.

Data– Describe the evidence you will use to test the model and discuss any possible problems with measurement error.

Estimation and Results– Describe your estimation procedure, report the results, and explain how well they fit or refute the model.

Conclusions– Summarize the results, explain why they are important, and what conclusions you can draw from the research.

- *Model Two: Experimental paper*

Introduction– Describe the issue and why it is an important area to study.

Literature Review – Survey the existing literature on the issue and describe why your contribution extends the literature or fills gaps within the literature.

Analytical Model– Discuss the analytical framework and predictions.

Experimental Design– Describe how the experiment will be done, with instructions and supporting documents in appendices.

Data from the Experiments and Results– Analyze the data and discuss the results.

Conclusions– Describe how the results enhance the literature and make suggestions for further research.

- *Model Three: Theoretical Paper*

Introduction– Describe the issue and why it is an important area to study.

Literature Review – Survey the existing literature on the issue and describe why your contribution extends the literature or fills gaps within the literature.

The Model – Develop the fundamental modeling framework.

Theorems, Lemmas and Proofs– Modern papers typically give intuitive descriptions of the findings, as well as more formal statements of findings in the form of theorems and lemmas, and proofs.

Conclusions– Describe how the results enhance the literature and make suggestions for further research.

## **Tips for Embarking on a Dissertation or Research Topic**

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### Plunge Ahead into a Topic

Often you will start with a broad topic, narrowing your research and scope over time. Many students try to keep their options open in case they choose to switch topics in the future. While choosing another topic is an option, the only way to arrive at a solid dissertation topic is to plunge deeply into that subject.

### Find a Mentor or Mentors with Interests in Your Topic

It is *extremely* important to forge relationships with faculty who share your research interests in order to aid you in the development of your topic and guide your research. They can help you identify whether a topic merits further consideration or should be disregarded in favor of other, more appropriate areas of inquiry, reducing the number of mistakes you make. When employers are evaluating our students, they pay close attention to individual faculty members' student assessments. If you capture the attention and respect of the faculty, you empower them with more tools to sell you on the job market.

### Write Up Everything While You Work

At every stage of your planning, research, and analysis write up what you are working on. If you are reading articles for a literature review, summarize the articles after you read them. Find ways to tie them to the articles you have already read, and document new questions or directions to explore. If you are developing a theoretical model or a theorem, write it out formally as you go. The process of writing about your topic propels your thinking forward. Ideas that seem promising while floating around your brain may look silly once you write them down. The writing clarifies your thinking because it forces you to explain your ideas in ways that others can understand. The other major advantage of writing is that you can share what you have written with others and get much better feedback as a result.

### Expect to Have to Redo Steps, Reread, and Rethink Issues

Most research requires you to backtrack at times and rethink what you are doing. Nearly all respected scholars write and rewrite articles several times before they send them out for publication, and then further revise them in response to the comments of referees.

### Set Aside Specific Times that you Devote Only to Your Research

Given the long-term nature of your research you will find that short-term distractions are many. There are always other immediate deadlines vying for your attention --grading, teaching, and work at home--will draw you away from working on the dissertation. To combat this, be sure to set aside four hours a day that you devote exclusively to the dissertation. Let nothing interfere with that time. You may end up staring off into space sometimes during that period, but even that time is helping you formulate the work.

### Set Short-Term Goals Related to the Research

The dissertation is a big project and seems overwhelming at the start. Take smaller portions of the project and set times that you will finish them, you may choose to do this with your dissertation advisor. Attempting to meet a deadline for each part forces you to start working on it. You may miss your deadline by a couple of days or a week, but striving to meet your deadlines will help you to finish sooner. As soon as you meet one deadline, set another goal.

## The Nuts and Bolts of Going on the Job Market

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Just about everything that you have been doing in the program has been preparing you for going on the Job Market. The more you can show that you have a successful and viable research agenda, the better off you will be. This includes published papers, papers submitted to journals, working papers, grants received, conference presentations given, courses taught. Remember you are going to be one of 300 or so applicants for each position, so you need to stand out in some way.

In your fourth year you need to be thinking about what your research will look like when you are on the job market in the fifth year. The most important feature of your job market packet will be your job market paper. Therefore, it needs to be in superb shape by the time you get to October of your fifth year. You should be working to have a decent draft of the job market paper in May of the fourth year that you can present to your committee. You can then use the feedback from them to improve the paper over the summer and then fine tune it in September of the fifth year.

The academic market and a significant portion of the nonacademic market revolves around several institutions. The American Economic Association publishes, in hard copy and on the web, Job Openings for Economists (JOE). The openings list nearly all of the academic openings and a significant number of nonacademic openings.

The timing of the market usually centers on the Allied Social Sciences Association meetings (also known as the AEA meetings) in early January. Most job candidates typically send out several dozen job packets in response to the jobs listed in the JOE. Most schools and a number of nonacademic employers do screening interviews at the AEA meetings. You should plan to send your packets out in early to mid November, as most schools and employers begin screening the applications between Thanksgiving and December 15<sup>th</sup>. After the AEA meetings, schools and employers bring their finalists to campus for a job talk and meetings with future colleagues.

You should start preparing your job packet in September. The packet should contain a vita, which lists your name, address, citizenship, research fields, teaching fields, past employment related to economics, papers published, papers submitted to journals, working papers, grants received, refereeing done, conference presentations, and other signs of your capabilities. Also, you should have a one to two page dissertation abstract that succinctly describes the importance of your dissertation topic and your key results. You want to include at least one completed paper that shows your research skills.

You will typically need three letters of recommendation from the faculty with whom you are working. The faculty give an honest assessment of the quality of your work in these letters and describe both your strengths and weaknesses. It is important to the reputation of the Department to have you succeed in the job that you obtain. Much of what we can say has been determined over the course of your career here. If you are performing well and show all the signs of great potential, we will work hard to publicize your potential. At the other extreme, if you have been just scraping by we will have to communicate this because we do not want to get a reputation for overselling students who cannot perform in job placements.

Most schools will ask for documentation of your teaching ability. The Assistant Department Head will also write a letter of recommendation related to your teaching skills and can provide summary evidence from your teaching evaluations.

Once you know where you wish to apply, contact the faculty with whom you are working and let them know. Often, it helps to have your advisors writing emails and/or making phone calls to their friends to alert them to take another look at your packet. The Department provides funding assistance to offset the cost of mailing out your applications.

The market for nonacademic jobs in business and consulting is somewhat tied to the timing described above, but not fully. Often we find out about job openings through former students or through employers contacting the Director of Graduate Studies. We have a strong pipeline to American Express in Phoenix. We have also placed students in a variety of companies around the nation and around the world.

## **You Can Do Great Things as a Graduate Student**

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There is a tendency for students to think that publishing papers and getting grants is beyond the capabilities of a graduate student. This is patently false. Here are just some of the successes that graduate students here have accomplished during the last few years.

### Publications:

Cary Deck in the *American Economic Review*, accepted in fourth year.  
Bart Wilson in the *Journal of Economics, Behavior, and Organization* in fourth year.  
David Dickinson in the *Journal of Economics, Behavior, and Organization* in fourth year.

### Economic History Association Dissertation Fellowship (\$10,000)

Todd Neumann (received 2005-2006)

### Economics History Association Exploratory Travel Grant

Todd Neumann (2003-2004)  
Jonathan Fox (2009-2010)  
Brendan Livingston (2009-2010)  
Carl Kitchens (2010-2011)

### NSF Dissertation Grants (\$10,000):

Ryan Johnson (2000-2001)  
Sam Allen (received 2003-2004)  
Radovan Vadovic (received 2005-2006)  
Jed Brewer (received 2006-2007)  
Quazi Shariar (received 2006-2007)  
Jonathan Fox (2009-2010)  
Matt Van Essen (2009-2010)  
Jonathan Fox (2009-2010)  
Brendan Livingston (2009-2010)  
Carl Kitchens (2010-2011)

### NBER Dissertation Fellowship (\$14,000):

Nidhi Thakur (received 2003-2004)  
Simona Lup (received 2004-2005)

### Dissertation Awards

Rebecca Holmes, Nevins Prize for Best Dissertation in North American Economic History from the Economic History Association.  
Samuel Allen, John Heinz Award for the Best Social Science Dissertation on Social Insurance from the National Institute for Social Insurance.

### Summer Internships in Other Places:

Bart Wilson, Federal Reserve Board of Governors  
Sam Allen, National Institute for Social Insurance  
Jeff Fuller and Joe Bial, Political Economy Research Center at Montana State University

Finished Thesis in Four Years or less:

A variety of people, including Tim Davies, Clemente Hernandez, Mary Rigdon, Eric Schorvitz, Joseph Bial, Ryan Johnson, Giorgio Coricelli and Kurt Schnier. Not only did Kurt Schnier finish in four years but his dissertation "Economic Analysis of Spatially Heterogeneous Resources: the Case of the Fishery" was named the outstanding dissertation of 2003 by the American Agricultural Economics Association.

Plus, students in quantities too numerous to count regularly give presentations at leading conferences, receive University Dissertation Grants of up to \$1,000, receive Departmental Travel Grants of up to \$300 and a handful of students have received Russell Sage Foundation Grants as well.

## Financial Support

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### Graduate Assistantships

Graduate students are primarily supported through Graduate Assistantships. Students awarded teaching assistantships are assigned to support a faculty member with course responsibilities. Most frequently, TA's are asked to grade and hold office hours and review sessions. Teaching assistants whose native language is not English and who are not citizens or permanent residents of the US must demonstrate proficiency in spoken English (see Appendix II for guidelines). As a general rule, teaching assistants do not serve as the primary instructor for a course during the fall or spring semesters.

Research assistantships are generally provided by individual faculty members' research grants. These faculty members submit requests for assignments to the Director of Graduate Studies. The duties of graduate research assistants vary according to the nature of the research project in which they participate and the source of funding. In some cases, the assigned work is directly applicable to the student's own research interests.

Decisions regarding graduate assignments are made by the Director of Graduate Studies, Department Chair and Graduate Program Coordinator. Both students and faculty are given the opportunity to make specific requests for assignments each semester. The committee makes every effort to honor these requests whenever possible but the primary consideration is to provide adequate support for faculty teaching undergraduate courses (see Appendix III for specific requirements and benefits associated with Graduate Assistantships).

It is important to note that graduate assistants are evaluated by their supervising faculty members each semester. The Graduate College does not allow a student receiving an unsatisfactory appraisal to receive funding in subsequent semesters. Additionally, students not making good progress in the program are vulnerable to losing their funding. The following list summarizes the criteria used to determine satisfactory progress and eligibility for funding:

- Students must pass the preliminary written exams in both theory and econometrics after their first year.
- Students must submit a second and third year research paper that is judged as "passing". Students who do not submit passing papers have the opportunity to revise their papers in the summer. Revisions must be submitted by mid-July.
- Students must submit a progress report approved by their advisor in February of both the third and fourth years.
- The Oral Comprehensive exam must be completed before October 1 of the fourth year.
- To receive funding in the fifth year, students must meet all the above criteria and must appear to be prepared to enter the job market during the fifth year and to defend their dissertation by the end of their fifth year.
- Students must maintain a grade point average of at least 3.0.

### Graduate Registration/Tuition Scholarships

The university charges both tuition and registration fees. Arizona residents are not charged tuition but do pay registration fees. Graduate Assistants appointed to a .50FTE assistantship (full support) have both their registration and tuition waived as part of the assistantship. Graduate Assistants appointed to a .25FTE assistantship (half time) receive a full tuition waiver and a 50% registration waiver.

The department has a limited number of Registration/Tuition Scholarships available to students receiving a .25 FTE assistantship or students not receiving a graduate assistantship. These scholarships are primarily awarded to first year students at the time of admission.

### **Summer/Winter Session Teaching**

Students who have passed the preliminary written examinations and a teaching audition may apply to teach a course during winter session (taught between the Fall and Spring semester), Pre-Session (taught in May, after the Spring semester), Summer I or Summer II. All students in the Ph.D. program are expected to teach two courses prior to completing the program.

### **Department Fellowships**

A limited number of Department fellowships are available but are primarily awarded to first year students at the time of admission.

### **Travel Grants**

The department awards \$300 travel grants to help students defray the cost of attending conferences. These grants are normally granted to students in their third year and beyond and are limited to one per year. To apply for the grant, students email the Director of Graduate Studies requesting the grant and stating the purpose of the grant. Students should specify if they are attending to present a paper. A Travel Authorization and an email from the Director of Graduate Studies must be completed and given to the Department Accountant **prior** to leaving on the trip. Upon return, receipts and a copy of the conference flyer must be turned in to the Department Accountant. In order to be reimbursed for meals, you should turn in all itemized meal receipts. If you do not have receipts you can be awarded no more than one-third the per diem rate.

The Graduate College, in conjunction with GPSC, awards travel grants for graduate and professional students who are attending or presenting research at academic or professional conferences. Visit the Graduate College webpage for further details:

<http://www.gpsc.arizona.edu/sections/funding/fundingSubsection/travelGrants.php>

## Life in the Economics Department

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### Department Access

The Economics department is located on the fourth floor of McClelland Hall. In order to provide access to the department at times when the department is not open to the public, all Ph.D. students will receive keys to both the building and department for their use while in the program. Students will also be given a Room Privilege Card which identifies them as someone who has legitimate access to the building. It is important to keep this card with you at all times. Campus Police will confiscate your keys if you cannot produce the card! The card has a sticker indicating the academic year for which you have been granted access. Each year get a new sticker from the Graduate Coordinator.

### Student Carrels

When possible, all students are assigned a study carrel for their use while in the program. This space consists of a desk chair and an overhead cabinet that locks for security. It is important to remember that this is a study area and it is important to show respect to fellow students by keeping the noise level low. **Teaching Assistants should never work with their students in the carrel area.**

There are Ethernet ports located throughout the carrel areas; however, not every carrel has a port. If needed, arrangements can be made to ensure access to a port. Wireless connectivity is also available throughout the building. Students who have laptops can access the internet through the wireless network. In order to access the wireless network you must first register your computer at [https://netid.arizona.edu/wireless\\_reg.php](https://netid.arizona.edu/wireless_reg.php).

Remember that the department cannot guarantee the security of belongings left in the carrel area. Please secure valuables in the overhead portion of your carrel. Please keep your carrel area neat.

If there is not enough carrel space in the department, first-year students are sometimes asked to share carrel space. However, every effort is made to provide each student with a carrel. Fourth and Fifth year students may be asked to move to another building where the department has additional study space.

### Graduate Lounge

The department maintains a lounge for use by the Economics doctoral students. The lounge contains four desktop computers, one laser printer, a small refrigerator and microwave, student mailboxes, and a telephone for student use. Upon arrival, students will receive an individual sign on and password in order to access the computer and the network printer. **Please remember to log off when you leave the computer!**

This area is used as a group study area and a place to relax and visit with fellow students. It is the students' responsibility to keep this area neat and orderly. Please make sure that food items are not left for long periods of time in the refrigerator. It is the student's responsibility to keep the appliances clean. There is another refrigerator in the supply room. This refrigerator is for staff and faculty use and IS NOT for graduate student use.

### Office Hours Rooms

There are three small rooms located in the front office of the department that are set aside for teaching assistants to hold office hours and meet with students. At the beginning of each semester Teaching Assistants should see the Undergraduate Coordinator to schedule a time. Times and rooms will be assigned on a first come first served basis.

When not in use for office hours, the rooms can be used for group study by doctoral students. Please check the schedule before using the room and be sure to vacate the room for students who have it scheduled for

office hours. Additionally, please be sure to vacate the room on time if another teaching assistant has the room scheduled immediately following your office hours.

### **Department Copiers**

The department has two copy machines that are accessible by individual copy code. The main copier located in the mailroom is primarily used for copying related to teaching and department business. Teaching Assistants may use this machine to make copies for their supervising instructors by using the faculty member's copy code. Teaching Assistants serving as primary course instructors will be assigned a copy code for this machine in order to make copies for their class. This machine is normally available during office hours only and is not to be used for copies related to a student's own coursework.

There is a smaller copier located mid-department which is primarily for graduate students to use and is available at all times. Each student will be assigned a unique copy code. While we currently do not have a limit or charge students for use of this machine, usage is monitored and we ask that students limit use to coursework and research needs.

### **Fax Machine**

The student copier also serves as the department fax machine. The machine requires a code for long distance calls. Please see the department staff for permission to use the machine for any long distance faxes. There is no charge for faxes related to educational and research needs.

### **Scanner**

There is a color scanner available at the front desk. Graduate students may use the scanner as long as a department staff member is not on duty. Please save all scanned documents to a removable disk or email scanned files and then delete them from the front desk computer. **Please do not save scanned files to the computer desktop.** The scanner is set for optimal performance for scanning documents. If you need to change the settings please return them to their original settings when finished.

The large copier in the mailroom can also scan and is much faster than the color scanner but only scans in black and white. However, since this machine is primarily used for copying related to courses taught by the department, scanning on this machine should be limited to large documents for research or class purposes only. Please request permission from the Undergraduate Coordinator before using this machine to scan.

### **Department Security**

The doors to the department should remain closed at all times by order of the fire marshal. The front doors to the department remain unlocked from 8:00am to 5:00pm Monday through Friday. They should remain locked and closed at all other times. The back door to the department is shared with MIS and should be closed and locked at all times. **Please do not prop the doors open!**

The door between the front office and main department should be closed and locked during all non-business hours. Also, please do not leave unsecured personal items (i.e. laptop computers or wallets) at your carrel.

**Please help us maintain department security by following these simple rules.**

## Appendix I - Official Requirements for a Master's Degree in Economics

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The graduate program in the Department of Economics is designed for Ph.D. students only. However, an M.A. option is given to students who either leave the Ph.D. program or wish to obtain a master's while continuing the Ph.D. program.

Students interested in earning the M.A. in Economics must complete 24 hours of core courses plus 6 more hours of graduate courses subject to the Graduate Director's approval. Further, students must pass a written masters examination on the core material. This exam is typically the same as the Ph.D. preliminary examination.

### Core Courses:

<b>Number</b>	<b>Title</b>	<b>Credit Hours</b>
ECON 501a	Graduate Microeconomics I	3 Hours
ECON 501b	Graduate Microeconomics II	3 Hours
ECON 520	Statistics for Economists	3 Hours
ECON 501c	Graduate Microeconomics III	3 Hours
ECON 502a	Graduate Macroeconomics	3 Hours
ECON 522a	Graduate Econometrics I	3 Hours
ECON 508	Research Methods in Economics	3 Hours
ECON 522b	Graduate Econometrics II	<u>3 Hours</u>
<b>Total</b>		<b>24 Hours</b>

## Appendix II–English Proficiency for International GTA’s

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All graduate assistants engaged in direct student contact whose NATIVE language is NOT ENGLISH and who are NOT CITIZENS OR PERMANENT RESIDENTS OF THE U.S. must demonstrate proficiency with spoken English. Verification of a passing score on either the iBT (international TOEFL), TSE, SPEAK or T-BEST<sup>1</sup> exam is required **before** the student’s hiring paperwork will be processed. Minimum scores for these tests are shown in the chart below.

Test Type	Minimum Score	Duties
iBT (international TOEFL)	26 or higher in the speaking subtest	No teaching limitations. No need of further screening through T-BEST <sup>1</sup> .
	< 26	Graduate Assistant must take T-BEST** <b>before</b> being appointed as Graduate Teaching Assistant/Associate
TSE/SPEAK <sup>2</sup>	50 or higher	No teaching limitations.
	45	Students must take GRAD 697D or CESL classes to teach in English. They are approved to teach their Native language, assist with lab set-up and grading, and hold office hours.
	< 45	Not eligible for TA position; must take CESL classes
T-BEST <sup>1</sup>	7	No teaching limitations.
	6	Students must take GRAD 697D or CESL classes to teach in English. They are approved to teach their Native Language, assist with lab set-up and grading, and hold office hours.
	5	Not eligible for TA position; must take CESL classes.

More information about the T-Best test can be found at <http://grad.arizona.edu/financial-resources/ta/about-tbest>.

<sup>1</sup>The Task-Based English-Speaking Test (T-BEST) is a new online test of English proficiency currently under development by the University of Arizona. International Graduate Assistants who do not earn a score of 26 or higher on the speaking subtest of iBT or cannot provide passing TSE/SPEAK scores as described above will be required to take the T-BEST exam.

<sup>2</sup>The TSE and SPEAK tests are being discontinued. International Graduate Assistants will no longer be able to take this exam at the University of Arizona.

## Appendix III–Graduate Assistantships

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### Academic Eligibility

Graduate Assistants must be enrolled in a graduate degree program at the University of Arizona and be admitted with a GPA of 3.0 or higher if a new student or maintain a 3.0 minimum GPA for all University of Arizona graduate credit courses.

### Employment Status and Limitation

Graduate Assistants are salaried employees. In the Department of Economics, they are appointed at either .25 FTE or .50 FTE. Depending on the appointment, they are required to work an average of 10 or 20 hours per week respectively.

Graduate Assistants are classified as student employees. As such they are:

- Limited to no more than 30 hours per week in total campus employment during periods of enrollment. Employment for International students on F-1 or J-1 visas must be limited to 20 hours per week while school is in session (Summer sessions are voluntary and are not limited). **This is a Federal regulation and there are no exceptions.**
- Exempt from deductions for Social Security taxes (FICA) during semesters or summer sessions when officially enrolled. Minimum enrollment for the exemption is six (6) units per semester for Fall/Spring or three (3) units for Summer session.
- Required to discuss with their supervisor any employment outside of the University of Arizona as this may interfere with their ability to carry out their duties effectively. (Employment outside the Department of Economics is strongly discouraged during the Fall/Spring semesters. Students should discuss any outside employment with the Director of Graduate Studies.)
- Not eligible for participation in The University of Arizona’s employee benefits program or the State of Arizona Retirement Program.
- Graduate Assistants hired on academic year contracts are NOT normally required to work before the start of classes, after finals, or during winter and spring break periods as part of their appointment, except for special circumstances which should be articulated in writing prior to hire. GA’s are hired for the ‘whole job’ and therefore required to perform work whenever it may be necessary. Often Graduate Assistants have preparation work to do before classes start. Work requirements must be articulated prior to hire as with any employee. Any hours worked about the norm must be paid via supplemental compensation.
- According to the Arizona Board of Regents policy, Graduate Assistants are not eligible for concurrent employment as staff or faculty. They may however, be eligible for additional compensation though Supplemental Compensation.

### Enrollment Limitations

In the Fall and Spring semesters Graduate Assistants are required to enroll for and complete a minimum of six (6) units of graduate credit each semester. Graduate Assistants are not required to enroll during the summer session to maintain student employment.

### Minimum Training Requirements

Graduate Assistants who will have direct instructional contact with students are required to FULLY participate in the Graduate Assistants/Associates Teaching Orientation (GATO), presented by The University Teaching Center and the Graduate College. GATO is a partial-day on-site presentation. International Graduate Assistants will also be required to attend the International GATO held on the same day. To register for GATO go to <http://www.utc.arizona.edu/tas/gato/index.html>.

Teaching Assistant Online Training is a collection of online modules about teaching and learning. Only the UA Policies module is required and students must achieve a minimum score of 95 to be considered passing. Students scoring less than 95 after their third attempt will require mandatory remediation with their department. To register for TATO go to <http://grad.arizona.edu/ta/tato/register>.

In addition to these Graduate College requirements, the Department offers a teaching workshop (ECON 597C) which is mandatory for all first-year students in the doctoral program.

### **Additional Requirements**

**No commercial activity:** The Graduate Council has ruled that Graduate Assistants not be allowed to engage in any commercial activity relative to the courses with which they are assisting at this university (e.g. selling course materials or conducting paid review sessions for courses in which they are directly involved as a TA.

**Assignment to graduate level classes:** Graduate Assistants may not be the instructor of record for classes giving graduate credit.