BUSINESS, PH.D.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Mode of Instruction</th>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.

**Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirements Detail

<table>
<thead>
<tr>
<th>Requirements Detail</th>
<th>51 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Minimum Credit Requirement</th>
<th>32 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Minimum Graduate Coursework Requirement</th>
<th>26 credits must be graduate-level coursework. Details can be found in the Graduate School’s Minimum Graduate Coursework (50%) policy (<a href="https://policy.wisc.edu/library/">https://policy.wisc.edu/library/</a> UW-1244 (<a href="https://policy.wisc.edu/library/UW-1244/">https://policy.wisc.edu/library/UW-1244/</a>)).</th>
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<table>
<thead>
<tr>
<th>Overall</th>
<th>3.00 GPA required.</th>
</tr>
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<table>
<thead>
<tr>
<th>Graduate GPA Requirement</th>
<th>This program follows the Graduate School's policy. <a href="https://policy.wisc.edu/library/UW-1203">https://policy.wisc.edu/library/UW-1203</a> (<a href="https://policy.wisc.edu/library/UW-1203/">https://policy.wisc.edu/library/UW-1203/</a>).</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Other Grade</th>
<th>n/a</th>
</tr>
</thead>
</table>

Assessments and Examinations

Doctoral students are required to take a comprehensive preliminary examination after they have cleared their record of all Incomplete and Progress grades (other than research and thesis). Some areas have an additional oral component. Deposit of the doctoral dissertation in the Graduate School is required.

Language

There are no curricular language requirements for Business Ph.D. students.

Breadth

A doctoral minor or Graduate/Professional certificate is not required for Business Ph.D. students. Breadth is achieved in other ways; see below.

REQUIRED COURSES

Business Ph.D. students choose one of seven curricular pathways to complete course requirements. In addition to pathway requirements, all Ph.D. students are required to participate in the Teaching Improvement Program and Graduate Assistant Equity Workshop.

Accounting and Information Systems Pathway

Students in our program develop a basic research background in both archival and behavioral empirical research. The program is one of the most balanced programs in the country in terms of support for different research methodologies and topics. Most students ultimately specialize in the research area and methodology that best suits their skills and research interests. Both behavioral (including experimental economics) and archival methods are strongly supported.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT I S 971</td>
<td>Seminar in Accounting Research</td>
<td>12</td>
</tr>
<tr>
<td>ECON 711</td>
<td>Economic Theory-Microeconomics Sequence or A A E 635 or A A E 705</td>
<td>6</td>
</tr>
<tr>
<td>GEN BUS 933</td>
<td>Beginning a Research Career in Business</td>
<td>7-9</td>
</tr>
<tr>
<td>ECON 709</td>
<td>Economic Statistics and Econometrics I</td>
<td>6</td>
</tr>
<tr>
<td>ECON 710</td>
<td>Economic Statistics and Econometrics II</td>
<td>6</td>
</tr>
<tr>
<td>PSYCH 610</td>
<td>Design and Analysis of Psychological Experiments I</td>
<td>6</td>
</tr>
<tr>
<td>PSYCH 710</td>
<td>Design and Analysis of Psychological Experiments II</td>
<td>6</td>
</tr>
<tr>
<td>A A E 636</td>
<td>Applied Econometric Analysis I</td>
<td>6</td>
</tr>
<tr>
<td>A A E 637</td>
<td>Applied Econometric Analysis II</td>
<td>6</td>
</tr>
</tbody>
</table>

Breadth Requirement | 9 |

Additional Coursework | 15-17 |

Total Credits | 51 |
These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

Students will need to take ACCT IS 971 Seminar in Accounting Research four times to meet this requirement.

Students also develop specialization in a related field such as economics, psychology, or sociology. Finally, students build a foundation in statistics that supports their research interests. Methodology courses in economics, agricultural economics, or psychology will generally provide a strong foundation.

This could include the following courses: ACCT IS 990 Accounting Independent Research PhD Thesis, ACCT IS 999 Reading and Research-Accounting PhD, and other non-research coursework decided with their advisor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ECON 461</td>
<td>International Macroeconomics</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 464</td>
<td>International Trade</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 467</td>
<td>International Industrial Organizations</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 521</td>
<td>Game Theory and Economic Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON/POP HLTH/PUB AFFR 548</td>
<td>The Economics of Health Care</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 712</td>
<td>Economic Theory-Macroeconomics Sequence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 713</td>
<td>Economic Theory: Microeconomics Sequence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 716</td>
<td>Econometric Methods</td>
<td>3</td>
</tr>
<tr>
<td>ECON 717</td>
<td>Applied Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 736</td>
<td>Macroeconomic Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 741</td>
<td>Theory of Public Finance and Fiscal Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 742</td>
<td>Theory of Public Finance and Fiscal Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 751</td>
<td>Survey of Institutional Aspects of Labor Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 761</td>
<td>Industrial Organization Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 762</td>
<td>Empirical Analysis of Industrial Organization and Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>A A E 636</td>
<td>Machine Learning in Applied Economic Analysis</td>
<td>4</td>
</tr>
<tr>
<td>A A E 637</td>
<td>Applied Econometric Analysis III</td>
<td>3</td>
</tr>
<tr>
<td>A A E 777</td>
<td>Survey and Sample Design in Applied Economics</td>
<td>2</td>
</tr>
<tr>
<td>A A E 875</td>
<td>Special Topics (Topic: Introduction to Object-Oriented Programming and Data Analytics)</td>
<td>1-4</td>
</tr>
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</table>

### Economic Theory Requirement

Select one of the following sequences:

- ECON 711 & ECON 713 Economic Theory-Microeconomics Sequence and Economic Theory-Microeconomics Sequence
- ECON 712 & ECON 714 Economic Theory-Macroeconomics Sequence and Economic Theory-Macroecomics Sequence

### Econometrics Requirement

Select one of the following sequences:

- ECON 709 & ECON 710 Economic Statistics and Econometrics I and Economic Statistics and Econometrics II
- STAT 849 & STAT 850 Theory and Application of Regression and Analysis of Variance I and Theory and Application of Regression and Analysis of Variance II

### Other Requirements

- GEN BUS 806 Panel Data Analysis                                      | 3       |
- GEN BUS 933 Beginning a Research Career in Business                  | 1       |
- R M I 920 Seminar in Actuarial Science, Risk Management & Insurance I | 3       |
- R M I 930 Seminar in Actuarial Science, Risk Management & Insurance II | 3       |

**Breadth Requirement**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A A E/ENVIR ST/POP HLTH/PUB AFFR 881</td>
<td>Benefit-Cost Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Independent Research**

Students are required to present to the faculty an original research project (possibly co-authored with a faculty member or with another student) by the end of the student’s third year in the program. Independent of the presentation requirement, students must have completed a draft of their dissertation proposal (approved by their advisor) prior to the preliminary oral examination.

**Actuarial Science, Risk Management, and Insurance Pathway**

The course sequence for Ph.D. students in actuarial science, risk management, and insurance is customized to fit each student’s unique research interests and background. During your first two years of study, you will work with a Ph.D. faculty advisor to set an appropriate course sequence, consisting of a combination of courses within the Wisconsin School of Business and a set of advanced courses that form a coherent package and enhance your research skills from outside of the Wisconsin School of Business.
These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

During your first two years of study, you will work with a Ph.D. faculty advisor to set an appropriate course sequence, consisting of a combination of courses within the Wisconsin School of Business and a set of advanced courses that form a coherent package and enhance your research skills from outside of the Wisconsin School of Business.

This could include the following courses: R M I 990 Risk & Insurance Independent Research PhD Thesis, R M I 999 Reading and Research-Risk Management and Insurance PhD, and other non-research coursework decided with their advisor.

Finance Pathway 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FINANCE 920</td>
<td>Theory of Finance 2</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE 970</td>
<td>Seminar- Investments (Ph.D.) 2</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE 971</td>
<td>Seminar-Corporate Finance (Ph.D.) 2</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE 972</td>
<td>Topics Seminar-Finance PhD 2</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE 973</td>
<td>Seminar-Workshop in Finance 3</td>
<td>8</td>
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<tr>
<td>GEN BUS 933</td>
<td>Beginning a Research Career in Business</td>
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Econometrics Requirement

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 709</td>
<td>Economic Statistics and Econometrics I</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 710</td>
<td>Economic Statistics and Econometrics II</td>
<td>3-4</td>
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Economics Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 711</td>
<td>Economic Theory-Microeconomics Sequence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 712</td>
<td>Economic Theory-Macroeconomics Sequence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 713</td>
<td>Economic Theory: Microeconomics Sequence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 714</td>
<td>Economic Theory: Macroeconomics Sequence</td>
<td>3</td>
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</table>

Breadth Requirement 4

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<thead>
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<th>Title</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>9</td>
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Additional Coursework 5

<table>
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<th>Code</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1-3</td>
</tr>
</tbody>
</table>

Total Credits 51

1 These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

2 These courses are taught in the lecture format.

3 Students are required to take this course 4 times for credit. This course is taught in the seminar format.

At the beginning of the second year, each student proposes a set of three advanced courses that form a coherent package and enhance the student’s research skills. Students are free to choose elective courses offered by the economics, mathematics, or statistics departments. If applicable, students should work with their advisor to determine if courses in other areas are appropriate.

This could include the following courses: FINANCE 990 Finance Independent Research PhD Thesis, FINANCE 999 Reading and Research-Finance PhD, and other non-research coursework decided with their advisor.

Finance Workshop and Brownbag Series

Students are strongly encouraged to attend the weekly finance workshop and are strongly encouraged to attend the weekly brownbag seminar. Within two semesters of passing the PhD preliminary exam, doctoral students are required to make a presentation in either the workshop or the brownbag seminar of either a thesis proposal or a literature survey. In addition, students are required to give a workshop presentation of their dissertation research. Normally this presentation occurs shortly before the student begins their job search.

Summer Paper

During the first summer the students are required to complete a literature review paper on a topic approved by the PhD committee or by the student’s advisor. During the second summer, students are required to complete a research paper that should be on a finance topic and contain elements of original research that extend the existing literature. The topic may be either theoretical or empirical and should be chosen in consultation with one or more of the finance faculty, who may also provide guidance during the paper’s development. The written paper should be submitted no later than the first day of the Fall semester. The student will make an oral presentation of the paper to the finance faculty early during that Fall semester. In order to successfully complete this requirement, it is important for the student to choose a topic and begin data gathering and other preliminary work in the Spring semester.

Management and Human Resources Pathway 1

The management and human resources department offers a slate of foundational Ph.D. seminars across the group’s core areas of research, including human resource management (HR), organizational behavior (OB), organizational theory (OT), entrepreneurship (ENT), and strategy. The seminar offerings vary from year to year. Doctoral students are expected to take all Ph.D. seminars offered by the department, which consists of 17 credits.

<table>
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<tr>
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<tbody>
<tr>
<td>M H R 871</td>
<td>Seminar-Personnel Management</td>
<td>3</td>
</tr>
<tr>
<td>M H R 872</td>
<td>Seminar in Organizational Behavior and Design</td>
<td>3</td>
</tr>
<tr>
<td>M H R 973</td>
<td>Doctoral Research Seminar in Business Strategy</td>
<td>3</td>
</tr>
<tr>
<td>M H R 975</td>
<td>Doctoral Research Seminar in Management</td>
<td>3</td>
</tr>
<tr>
<td>M H R 976</td>
<td>Doctoral Research Seminar in Management</td>
<td>2</td>
</tr>
<tr>
<td>M H R 977</td>
<td>Emerging Entrepreneurship Theory and Research</td>
<td>3</td>
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</table>
**Other Requirements**

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<thead>
<tr>
<th>Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>GEN BUS 933</td>
<td>Beginning a Research Career in Business</td>
<td>1</td>
</tr>
</tbody>
</table>

**Advanced Research Methods and Statistics* (see list below for possible course options)**

**Breadth**

Students are required to take an additional 15 credits of coursework, level 700 or higher, from any department. A substantial share of coursework may be undertaken outside of the Wisconsin School of Business. Students take a diverse array of seminars in the economics, sociology, psychology, statistics, and computer science departments, depending on their specific research interests. These may be theory or methods courses.

Total Credits: 51

- Preliminary exams are written at the end of the second year. The exam, which takes place over two days, consists of four questions. Two questions cover the student’s primary concentration, one question covers the student’s secondary concentration, and there is one methods question. (The concentrations are human resource management, organizational behavior, or strategy/ENT/OT.)
- The subsequent two years of study are allocated to developing and defending a dissertation.

These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

**Code**   **Title**   **Credits**

*Advanced Research Methods and Statistics*

Required coursework in advanced research methods and statistics includes a minimum of 18 credits, consisting of two courses in statistics, two in research methodology, and two depth courses. Courses are selected in consultation with the student’s advisor. Examples of courses that have fulfilled these requirements in the past include:

<table>
<thead>
<tr>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>A A E/M HR 540</td>
<td>Intellectual Property Rights, Innovation and Technology</td>
<td>3</td>
</tr>
<tr>
<td>A A E 636</td>
<td>Applied Econometric Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>A A E 637</td>
<td>Applied Econometric Analysis II</td>
<td>4</td>
</tr>
<tr>
<td>A A E 737</td>
<td>Applied Econometric Analysis III</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 838</td>
<td>Topics in Computing</td>
<td>1-3</td>
</tr>
<tr>
<td>ECON 522</td>
<td>Law and Economics</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 700</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>ECON 701</td>
<td>Microeconomics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 702</td>
<td>Macroeconomics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 704</td>
<td>Econometrics I</td>
<td>3</td>
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<td>ECON 705</td>
<td>Econometrics II</td>
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<td>ECON 706</td>
<td>Econometrics III</td>
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<td>ECON 708</td>
<td>Microeconomics II</td>
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<td>ECON 709</td>
<td>Economic Statistics and Econometrics I</td>
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<td>ECON 710</td>
<td>Economic Statistics and Econometrics II</td>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 711</td>
<td>Economic Theory-Microeconomics Sequence</td>
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</tr>
<tr>
<td>ECON 712</td>
<td>Economic Theory-Macroeconomics Sequence</td>
<td>3</td>
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<tr>
<td>ECON 717</td>
<td>Applied Econometrics</td>
<td>3</td>
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<tr>
<td>ECON 750</td>
<td>Labor Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 873</td>
<td>Survey of Institutional Aspects of Labor Economics</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 711</td>
<td>Current Topics in Educational Psychology</td>
<td>1-3</td>
</tr>
<tr>
<td>ED PSYCH/ELPA</td>
<td>Introduction to Qualitative Research</td>
<td>3</td>
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<tr>
<td>ED POL/ELPA/</td>
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<td></td>
</tr>
<tr>
<td>RP &amp; SE 719</td>
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</tr>
<tr>
<td>MARKETING 971</td>
<td>Seminar-Marketing PhD</td>
<td>3</td>
</tr>
<tr>
<td>MATH/STAT 431</td>
<td>Introduction to the Theory of Probability</td>
<td>3</td>
</tr>
<tr>
<td>MATH 521</td>
<td>Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>POLI SCI 812</td>
<td>Introduction to Statistical Methods in Political Science</td>
<td>3</td>
</tr>
<tr>
<td>POLI SCI 813</td>
<td>Multivariable Statistical Inference for Political Research</td>
<td>3</td>
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<tr>
<td>POLI SCI 818</td>
<td>Maximum Likelihood Estimation</td>
<td>3</td>
</tr>
<tr>
<td>POLI SCI/A A E 835</td>
<td>Game Theory and Political Analysis</td>
<td>3</td>
</tr>
<tr>
<td>POLI SCI 919</td>
<td>Seminar-Advanced Methodology</td>
<td>3</td>
</tr>
<tr>
<td>PSYCH 610</td>
<td>Design and Analysis of Psychological Experiments I</td>
<td>4</td>
</tr>
<tr>
<td>PSYCH 710</td>
<td>Design and Analysis of Psychological Experiments II</td>
<td>4</td>
</tr>
<tr>
<td>PSYCH 711</td>
<td>Current Topics in Psychology</td>
<td>2-3</td>
</tr>
<tr>
<td>R M I 930</td>
<td>Seminar in Actuarial Science, Risk Management &amp; Insurance II</td>
<td>3</td>
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<tr>
<td>SOC/C&amp;E SOC 360</td>
<td>Statistics for Sociologists I</td>
<td>4</td>
</tr>
<tr>
<td>SOC/C&amp;E SOC 361</td>
<td>Statistics for Sociologists II</td>
<td>4</td>
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<tr>
<td>SOC 362</td>
<td>Statistics for Sociologists III</td>
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</tr>
<tr>
<td>SOC 375</td>
<td>Introduction to Mathematical Sociology</td>
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<tr>
<td>SOC 632</td>
<td>Sociology of Organizations</td>
<td>3-4</td>
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<td>SOC/C&amp;E SOC 652</td>
<td>Sociology of Economic Institutions</td>
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<tr>
<td>COB 901</td>
<td>Seminar-Mathematical and Statistical Applications in Sociology</td>
<td>3</td>
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<tr>
<td>STAT 849</td>
<td>Theory and Application of Regression and Analysis of Variance I</td>
<td>3</td>
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</table>

### Marketing Pathway

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MARKETNG 971</td>
<td>Seminar-Marketing PhD</td>
<td>2</td>
</tr>
<tr>
<td>MARKETNG 972</td>
<td>Seminar-Marketing PhD</td>
<td>2</td>
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<tr>
<td>GEN BUS 933</td>
<td>Beginning a Research Career in Business</td>
<td>1</td>
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</table>

### Breadth Requirement (see list below for possible course options)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP SCI/E SYE 719</td>
<td>Stochastic Programming</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/I SYE/E/ MATH/STAT 726</td>
<td>Nonlinear Optimization I</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/E C E 761</td>
<td>Mathematical Foundations of Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/ ED PSYCH/ PSYCH 770</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/E C E/ STAT 861</td>
<td>Theoretical Foundations of Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>ECON 700</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>ECON 701</td>
<td>Microeconomics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 702</td>
<td>Macroeconomics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 704</td>
<td>Econometrics I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 705</td>
<td>Econometrics II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 706</td>
<td>Econometrics III</td>
<td>3</td>
</tr>
<tr>
<td>ECON 708</td>
<td>Microeconomics II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 709</td>
<td>Economic Statistics and Econometrics I</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 710</td>
<td>Economic Statistics and Econometrics II</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 711</td>
<td>Economic Theory-Microeconomics Sequence</td>
<td>3</td>
</tr>
<tr>
<td>ECON 713</td>
<td>Economic Theory: Microeconomics Sequence</td>
<td>3</td>
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<tr>
<td>ECON 717</td>
<td>Applied Econometrics</td>
<td>3</td>
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<tr>
<td>ECON 761</td>
<td>Industrial Organization Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 762</td>
<td>Empirical Analysis of Industrial Organization and Public Policy</td>
<td>3</td>
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<tr>
<td>ECON 809</td>
<td>Topics in Microeconomic Theory</td>
<td>1-3</td>
</tr>
<tr>
<td>ECON 899</td>
<td>Recent Advances in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>ED PSYCH 711</td>
<td>Current Topics in Educational Psychology</td>
<td>1-3</td>
</tr>
<tr>
<td>ED PSYCH 760</td>
<td>Statistical Methods Applied to Education I</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 761</td>
<td>Statistical Methods Applied to Education II</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 763</td>
<td>Regression Models in Education</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 773</td>
<td>Factor Analysis, Multidimensional Scaling and Cluster Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 960</td>
<td>Structural Equation Modeling</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 964</td>
<td>Hierarchical Linear Modeling</td>
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<tr>
<td>POLI SCI 818</td>
<td>Maximum Likelihood Estimation</td>
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<tr>
<td>POLI SCI 919</td>
<td>Seminar-Advanced Methodology</td>
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<tr>
<td>SOC 952</td>
<td>Seminar-Mathematical and Statistical Applications in Sociology</td>
<td>3</td>
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<tr>
<td>STAT 609</td>
<td>Mathematical Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 610</td>
<td>Introduction to Statistical Inference</td>
<td>4</td>
</tr>
</tbody>
</table>

1 These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

2 Students take each of these seminars twice.

### Additional Coursework

Students will take additional credits of coursework, decided in consultation with their advisor.

### Total Credits

51

Students will complete four courses at the graduate level, either inside or outside the School of Business. These courses will form a coherent topic related to the student’s specific research interest and will include at least one course in the methods of data collection and at least one in the methods of data analysis. Students will select these courses in consultation with their advisor. Courses that have fulfilled these requirements in the past include:

### Methods of Data Collection

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTHRO 909</td>
<td>Research Methods and Research Design in Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ART HIST/ AFROAMER 801</td>
<td>Historiography, Theory and Methods in Visual Culture</td>
<td>3</td>
</tr>
<tr>
<td>COM ARTS 762</td>
<td>Communication Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/E C E 760</td>
<td>Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 766</td>
<td>Computer Vision</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 762</td>
<td>Introduction to the Design of Educational Experiments</td>
<td>3</td>
</tr>
<tr>
<td>ED PSYCH 861</td>
<td>Statistical Analysis and Design in Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>PSYCH 610</td>
<td>Design and Analysis of Psychological Experiments I</td>
<td>4</td>
</tr>
<tr>
<td>PSYCH 710</td>
<td>Design and Analysis of Psychological Experiments II</td>
<td>4</td>
</tr>
<tr>
<td>MARKETNG 710</td>
<td>Marketing Research</td>
<td>3</td>
</tr>
<tr>
<td>MARKETNG 805</td>
<td>Qualitatively-Based Marketing Insights</td>
<td>3</td>
</tr>
</tbody>
</table>
higher or any A A E course numbered 600 or higher. This requirement can be met with any ECON course numbered 400 or higher. This requirement can be met with any STAT course numbered 300 or higher.

**Linear Algebra**

These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

1. **Operations and Information Management Pathway**

   The Operations and Information Management Pathway is designed to be customized by each student. Each student will work directly with their advisor to determine the appropriate courses to take to meet all of the requirements listed below. For a student entering the Ph.D. program with a master's degree in the major area, the required coursework is estimated to take two years. Students without a relevant master's degree may take an additional semester to complete the required coursework. Before becoming a dissertator, Ph.D. students must both complete 32 credits of coursework and pass a preliminary exam.

   - **Code**
   - **Title**
   - **Credits**
   - Mathematical Foundation 2
   - Statistical Foundation 3
   - Economics Foundation 4
   - Research Electives 5
   - Breadth Requirement 6
   - Additional Requirement 7
   - Total Credits 51

   These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

   2. This requirement can be met with MATH 340 Elementary Matrix and Linear Algebra or any MATH course numbered 500 or higher.

   3. This requirement can be met with any STAT course numbered 300 or higher.

   4. This requirement can be met with any ECON course numbered 400 or higher or any A A E course numbered 600 or higher.

   **Proposal Examination**

   An oral dissertation proposal exam is to be taken approximately one year after the successful passing of the preliminary exam. Two weeks prior to the exam, a dissertation proposal document should be submitted to the examination committee. This proposal should contain (1) a clear statement of, and motivation for, the dissertation topic; (2) a thorough review of the literature; (3) an in-depth discussion of the research methodologies and analysis approaches that will be followed; (4) anticipated findings and contributions of the research; and (5) a time-phased plan of milestones to be reached during the remainder of the candidate's study.

   The proposal exam can only be taken twice. The second exam must be taken within one year of the first exam. Failure to pass the second time, as decided by the examination committee, will lead to the student's termination from the PhD program.

   **Real Estate and Urban Land Economics Pathway**

   The Wisconsin PhD Program in Real Estate and Urban Land Economics prepares individuals for careers in research and teaching at the university level. The program is academically rigorous and highly quantitative, providing a strong foundation in financial and economic theory, as well as in mathematical and statistical techniques. Through a customized program of elective courses and dissertation research, students specialize in a particular area of real estate economics and finance.

   - **Code**
   - **Title**
   - **Credits**
   - **Real Estate Courses**
   - REAL EST 870  Advanced Real Estate Finance Theory (Advanced Urban Land Economics) 3
   - REAL EST 875  Advanced Urban Land Economics (Advanced Real Estate Finance Theory) 3
   - REAL EST 978  Research Seminar in Real Estate and Urban Land Economics (Real Estate Workshop) 5
   - **Finance Courses**
   - FINANCE 920  Theory of Finance 3
   - FINANCE 970  Seminar- Investments (Ph.D.) 3
   - or FINANCE 971  Seminar-Corporate Finance (Ph.D.)
or FINANCE 972 Topics Seminar-Finance PhD

Economics Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 709</td>
<td>Economic Statistics and Econometrics I</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 710</td>
<td>Economic Statistics and Econometrics II</td>
<td>3-4</td>
</tr>
<tr>
<td>ECON 711</td>
<td>Economic Theory-Microeconomics Sequence</td>
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</tr>
<tr>
<td>ECON 712</td>
<td>Economic Theory-Macroeconomics Sequence</td>
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<tr>
<td>ECON 713</td>
<td>Economic Theory: Microeconomics Sequence</td>
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<tr>
<td>ECON 714</td>
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Other Requirement

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>GEN BUS 933</td>
<td>Beginning a Research Career in Business</td>
</tr>
</tbody>
</table>

Breadth Requirement 9

Additional Coursework 4-6

Total Credits 51

1 These pathways are internal to the program and represent different routes a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

2 Starting in the second semester, students take the real estate workshop. This workshop is designed to help students make progress toward completion of their second-year paper and their dissertation. Students are required to take this course 5 times for credit. Students are encouraged to audit this workshop during their first semester and while working on their dissertation.

3 At the beginning of the second year, each student proposes a set of three advanced courses that form a coherent package and enhance the student’s research skills. Students are free to choose PhD level elective courses offered by the economics, finance, agricultural & applied economics, mathematics, or statistics departments. It may also be appropriate to choose courses in computer science, law, psychology, accounting, marketing, or other areas taught at UW–Madison.

4 This could include the following courses: ECON 715 Econometric Methods, ECON 899 Recent Advances in Economics, REAL EST 990 Real Estate Independent Research PhD Thesis, REAL EST 999 Reading and Research-Real Estate PhD, and other non-research coursework decided with their advisor.

Summer Paper Requirement

During the first summer, students are normally preparing for the Microeconomics preliminary exam. During subsequent summers they are involved with research activities or supplementary course work. They may also be employed in assistantship positions or internships which enhance their knowledge and research skills. During the second summer, there is also a specific requirement to complete a research paper. This paper should be on a real estate Economics or finance topic and contain elements of original research which extend the existing literature. The topic may be either theoretical or empirical and should be chosen in consultation with one or more of the real estate faculty, who may also provide guidance during the paper’s development. The written paper should be submitted no later than the first day of the fall semester. The student will make an oral presentation of the paper to the real estate faculty early during that fall semester. In order to successfully complete this requirement, it is important for the students to choose a topic and begin data gathering and other preliminary work in the spring semester.

Examinations

Students must take the Microeconomics Theory Exam at the end of their first year in the program.