

OPERATIONS, INFORMATION AND DECISIONS, PHD

Wharton’s program in Operations, Information and Decisions emphasizes research on real management problems and maintains a balance between theory and implementation. The faculty trains scholars in decision making, information systems and operations management.

Our faculty leads in the development and application of an innovative blend of analytical and empirical approaches to important problems facing the private and public sectors, including the design, development, and evaluation of:

- behavioral approaches to individual and managerial decision making;
- information systems as a means of commerce and of decision making; and
- operations for the fulfillment of demand and broader economic and social needs.

Our PhD program provides a unique mix of behavioral, economic, statistical and analytical training to its students, and its strength is reflected in our students’ record of placement and achievement.

Three Areas of Specialization

Decision Making (DM)

What factors influence human judgment and decision-making? Why and when are people prone to judgement errors and biases? What kinds of interventions will help people make better decisions, or improve human welfare? Our interdisciplinary Decision-Making PhD program focuses on training students to conduct and publish academic research that helps to answer these important questions. Along the way, students receive rigorous quantitative/statistical training and acquire a deep understanding of the literature on judgment and decision-making, significant exposure to the fields of psychology, economics, organizational behavior, and marketing.

Information Systems (IS)

The Information Systems PhD Program covers a broad range of research interests, from the development of detailed analytical and information-technology-based methods for managing complex organizations to the broader economic evaluation of the impact of organizational and market-based use of information systems and information-based strategies.

Operations Management (OM)

The Operations Management PhD Program focuses on the processes that define an organization’s outputs, as well as the methods commonly used to analyze these processes. Students specializing in OM are interested in a wide range of functions, including operations strategy, product and process design, technology management, capacity planning, and supply chain management. Their work similarly covers a wide range of organizations and industries, including education, health care, hospitality, manufacturing, distribution, and retailing.

For more information: <https://doctoral.wharton.upenn.edu/operations-information-decisions/>

View the University’s Academic Rules for PhD Programs (<http://catalog.upenn.edu/pennbook/academic-rules-phd/>).

Curriculum

Students must complete 16 course units (CU’s) of classes to graduate. They may earn up to 4 CUs of credit for courses previously completed as a part of a master’s degree or PhD program, with the approval of the PhD Coordinator and the Wharton Doctoral Program Office.

Program Milestones

| Code | Title | Course Units |
|------|-------|--------------|
|------|-------|--------------|

The overall program of study is the same for all students:

| | | |
|---|--|--|
| <i>Summer before matriculation</i> | | |
| Preparatory Math and Tech Camps, August before the 1st Year (Optional) | | |
| <i>1st Year Fall</i> | | |
| (Mostly) Required Courses | | |
| <i>1st Year Spring</i> | | |
| (Mostly) Required Courses, Choose Summer Paper Topic and Advisor | | |
| <i>1st Year Summer</i> | | |
| Written Qualifier, 1st Year Summer Paper | | |
| <i>2nd Year Fall</i> | | |
| (Mostly) Elective Courses | | |
| <i>2nd Year Spring</i> | | |
| (Mostly) Electives Courses, Choose Dissertation Advisor, Sketch Area of Research Interest | | |
| <i>2nd Year Summer</i> | | |
| 2nd Year Summer Paper | | |
| <i>3rd Year</i> | | |
| Dissertation Research | | |
| <i>4th Year</i> | | |
| Dissertation Proposal in Fall | | |
| <i>5th Year</i> | | |
| Job Market, Dissertation Defense | | |

| Code | Title | Course Units |
|------|-------|--------------|
|------|-------|--------------|

Course Requirements

| | | |
|---|--|---|
| <i>Operations, Information and Decisions</i> | | |
| Introductory Faculty-Student Seminar | | 1 |
| OIDD 9010 | Introduction to OID Faculty and Their Research | |
| *This is a 0.5 CU course that must be taken in both the Fall and Spring semesters of the first year. | | |
| At least one of the following three core disciplinary courses, with the approval of the OID PhD Coordinator | | 1 |
| OIDD 9000 | Foundations of Decision Processes | |
| OIDD 9400 | Operations Management | |
| OIDD 9550 | Research Seminar in Information Systems | |
| At least two CU in statistics/econometrics, with the approval of the OID PhD Coordinator and Wharton Statistics Department. The courses include but are not limited to the following. | | 2 |
| STAT 5000 | Applied Regression and Analysis of Variance | |

| | | |
|---|---|---|
| STAT 5010 | Introduction to Nonparametric Methods and Log-linear Models | |
| STAT 5150 | Advanced Statistical Inference I | |
| STAT 5160 | Advanced Statistical Inference II | |
| STAT 5200 | Applied Econometrics I | |
| STAT 5210 | Applied Econometrics II | |
| ECON 7300 | Econometrics I: Fundamentals | |
| ECON 7310 | Econometrics II: Methods & Models | |
| At least two CU in economics, with the approval of OID's PhD Coordinator. These courses include but are not limited to the following. | | 2 |

| | | |
|-----------------------|---|--|
| ECON 6100 | Microeconomic Theory | |
| ECON 6110 | Game Theory and Applications | |
| ECON 7100 & ECON 7200 | Microeconomic Theory I and Macroeconomic Theory I | |
| ECON 7110 | Microeconomic Theory II | |
| BEPP 9040 | Experimental Economics | |
| BEPP 9150 | Behavioral Economics and Policy Analysis | |
| BEPP 9320 | Contract Theory and Applications | |

Additional Courses Required of All Operations Management Students

At least one CU of OIDD 9410, Distribution Systems Seminar, the department's advanced seminar in Operations Management. OIDD 9410 is a 0.5 CU course, and students fulfill the requirement by taking it at least twice. 1

At least one CU of courses related to stochastic processes, with the approval of OID's PhD Coordinator. These courses include but are not limited to the following. 1

| | | |
|-----------|---|--|
| OIDD 9300 | Stochastic Models | |
| OIDD 9310 | Stochastic Processes II | |
| OIDD 9340 | Dynamic Programming and Stochastic Models | |
| STAT 9310 | Stochastic Processes | |

At least one CU of courses related to optimization, with the approval of OID's PhD Coordinator. These courses include but are not limited to the following. 1

| | | |
|-----------|------------------------------|--|
| OIDD 9120 | Introduction to Optimization | |
|-----------|------------------------------|--|

Decision Making Track

| Code | Title | Course Units |
|---|---|--------------|
| Decision Making Track | | |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| <i>Statistics/Econometrics sequence</i> | | 2 |
| Statistics Options | | |
| STAT 5000 & STAT 5010 | Applied Regression and Analysis of Variance and Introduction to Nonparametric Methods and Log-linear Models | |
| STAT 5150 & STAT 5160 | Advanced Statistical Inference I and Advanced Statistical Inference II | |
| STAT 5200 & STAT 5210 | Applied Econometrics I and Applied Econometrics II | |
| Econometrics Option | | |

| | | |
|--|--|-----------|
| ECON 7300 & ECON 7310 | Econometrics I: Fundamentals and Econometrics II: Methods & Models | |
| <i>Economics</i> | | 2 |
| ECON must be 6000 or above | | |
| BEPP 9040 | Experimental Economics | |
| BEPP 9150 | Behavioral Economics and Policy Analysis | |
| BEPP 9320 | Contract Theory and Applications | |
| OIDD 9000 | Foundations of Decision Processes | 1 |
| 10 CU of electives at the 5000-level or above. | | 10 |
| Electives can include any Wharton course or PSYC, COMM, EDUC, CIS, or ESE courses. | | |
| Total Course Units | | 16 |

Information Systems Track

| Code | Title | Course Units |
|--|--|--------------|
| Information Systems Track | | |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| <i>Statistics/Econometrics Sequence</i> | | 2 |
| Statistics Options: | | |
| STAT 5150 & STAT 5160 | Advanced Statistical Inference I and Advanced Statistical Inference II | |
| STAT 5200 & STAT 5210 | Applied Econometrics I and Applied Econometrics II | |
| Econometrics Option: | | |
| ECON 7300 & ECON 7310 | Econometrics I: Fundamentals and Econometrics II: Methods & Models | |
| <i>Economics</i> | | 2 |
| ECON 6000 and above | | |
| OIDD 9550 | Research Seminar in Information Systems | 1 |
| 10 CUs of electives at the 5000 level or above | | 10 |
| Electives can include any Wharton course or PSYC, COMM, EDUC, CIS or ESE courses | | |
| Total Course Units | | 16 |

Operations Management Track

| Code | Title | Course Units |
|---|--|--------------|
| Operations Management Track | | |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| <i>Statistics/Econometrics Sequence</i> | | 2 |
| Statistics Option: | | |
| STAT 5150 & STAT 5160 | Advanced Statistical Inference I and Advanced Statistical Inference II | |
| STAT 5200 & STAT 5210 | Applied Econometrics I and Applied Econometrics II | |
| Econometrics Option: | | |
| ECON 7300 & ECON 7310 | Econometrics I: Fundamentals and Econometrics II: Methods & Models | |
| <i>Economics</i> | | 2 |
| ECON 6000 or above | | |
| OIDD 9400 | Operations Management | 1 |

| | | |
|--|---|-----------|
| OIDD 9410 | Distribution Systems Seminar | 0.5-1 |
| <i>Stochastic Processes</i> | | 7 |
| OIDD 9300 | Stochastic Models or OIDD 931(Stochastic Processes II or OIDD 934(Dynamic Programming and Stochastic Models or STAT 931(Stochastic Processes | |
| <i>Optimization</i> | | 7 |
| OIDD 9120 | Introduction to Optimization | |
| See advisor for other options | | |
| 7 CUs of Electives at the 5000 level or above | | 7 |
| Electives can include any Wharton course or PSYC, COMM, EDUC, CIS or ESE courses | | |
| Total Course Units | | 16 |

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2024 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.

Typical Course Schedules

As the Requirements Outline suggests there is great flexibility in how students may complete their course requirements. Thus, while the example plans of study, below, provide a sense of common first-year course rosters for the three concentrations, individual students' plans can vary widely.

Decision Making

| First Year | | |
|------------|--|-------------------------------|
| Fall | | |
| | | Course Units |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| OIDD 9000 | Foundations of Decision Processes | 1.0 |
| STAT 5000 | Applied Regression and Analysis of Variance | 1.0 |
| Elective | | 0.5 |
| Elective | | 0.5 |
| Elective | | 0.5 |
| | | Course Units 4.00-4.50 |
| Spring | | |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| ECON 6110 | Game Theory and Applications | 1.0 |

| | | |
|-----------|--|-------------------------------------|
| STAT 5010 | Introduction to Nonparamet Methods and Log-linear Models | 1.0 |
| Elective | | 0.5 |
| Elective | | 0.5 |
| Elective | | 0.5 |
| | | Course Units 4.00-4.50 |
| | | Total Course Units 8.00-9.00 |

Decision Making students then take a second economics course and electives in the second year.

Information Systems

| First Year | | |
|------------|--|-------------------------------------|
| Fall | | |
| | | Course Units |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| Elective | | 0.5 |
| Elective | | 0.5 |
| Elective | | 0.5 |
| STAT 5200 | Applied Econometrics I | 1.0 |
| ECON 6100 | Microecononr Theory | 1.0 |
| | | Course Units 4.00-4.50 |
| Spring | | |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 |
| OIDD 9550 | Research Seminar in Information Systems | 1.0 |
| STAT 5210 | Applied Econometric II | 1.0 |
| ECON 6110 | Game Theory and Applications | 1.0 |
| Elective | | 0.5 |
| | | Course Units 4.00-4.50 |
| | | Total Course Units 8.00-9.00 |

Information Systems students then take electives in the second year.

Operations Management

| First Year | | | Course Units | | |
|---------------|--|------------------|--------------|--|-----|
| Fall | | | | | |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 | FNCE 9260 | Empirical Methods in Corporate Finance | 1 |
| OIDD 9400 | Operations Management | 1.0 | MGMT 9330 | Psychological Foundations of Research in Management | |
| OIDD 9120 | Introduction to Optimization | 0.5 | MGMT 9530 | Seminar in Research Design | 0.5 |
| OIDD 9300 | Stochastic Models | 0.5 | MGMT 9570 | Applied Research Methods and Data Analysis in Organizational Behavior | |
| STAT 5200 | Applied Econometrics I | 1.0 | MGMT 9610 | Special Topics in OB: Making a Contribution | |
| ECON 6100 | Microecon Theory | 1.0 | MKTG 9400 | Measurement and Data Analysis in Marketing - Part A | |
| | Course Units | 4.50-5.00 | MKTG 9500 | Judgment and Decision Making Perspectives on Consumer Behavior - Part A | 0.5 |
| Spring | | | MKTG 9510 | Judgment and Decision Making Perspectives on Consumer Behavior - Part B | 0.5 |
| OIDD 9010 | Introduction to OID Faculty and Their Research | 0.5-1 | MKTG 9520 | Contemporary Topics in Consumer Research - Part A | 0.5 |
| OIDD 9410 | Distribution Systems Seminar | 0.5 | OIDD 9370 | Methods Stumblers: Pragmatic Solutions to Everyday Challenges in Behavioral Research | 0.5 |
| OIDD 9310 | Stochastic Processes II | 0.5 | OIDD 9530 | Explaining Explanation | 1 |
| STAT 5210 | Applied Econometrics II | 1.0 | OIDD 9920 | Conflict Mgmt Seminar | 1 |
| ECON 6110 | Game Theory and Applications | 1.0 | STAT 5710 | Modern Data Mining | |
| | Course Units | 3.50-4.00 | STAT 9210 | Observational Studies | 1 |
| | Total Course Units | 8.00-9.00 | STAT 9270 | Bayesian Statistical Theory and Methods | 1 |
| | | | STAT 9710 | Introduction to Linear Statistical Models | 1 |
| | | | STAT 9740 | Modern Regression for the Social, Behavioral and Biological Sciences | 1 |

Common Electives

The choice of elective courses can also vary widely, according to each student's interests and focus of research, and valuable electives are offered within OID, as well as by departments throughout the University of Pennsylvania. The following list is a sample of courses, beyond the options listed above, that multiple OID PhD students have taken in the recent past.

| Code | Title | Course Units |
|-----------|---|--------------|
| BEPP 9110 | Empirical Public Policy | 1 |
| BEPP 9310 | Numerical Methods in Economics | 1 |
| CIS 5200 | Machine Learning | 1 |
| CIS 5220 | Deep Learning for Data Science | 1 |
| CIS 5450 | Big Data Analytics | 1 |
| ECON 8310 | Econometrics III: Advanced Techniques of Cross-Section Econometrics | 1 |
| ECON 8450 | Empirical Methods for Industrial Organization | 1 |