



The Business School  
for the World®

## **Pre-Course - Math Tutorials**

Math tutorials introduce the mathematical methods useful for economics and business research. This course will focus on applying various techniques rather than their theory. Final grades are based on several homework problem-sets alone. Discussion of homework problem-sets among students is encouraged.

## **PhD Core Courses**

The core curriculum comprises a set of required courses (112 units) common to all specialisation fields.

### **PhD 501 Microeconomic Theory (A), Microeconomic Theory (B) and Applied Microeconomics (C)**

The microeconomics core course is an introduction to microeconomic theory.

This course is an introduction to microeconomic modelling. The class will begin with the traditional topics of choice theory and consumer demand, production and analysis of cost functions, competitive equilibrium, and monopoly. Then, the class will cover decision-making under uncertainty and risk preferences. The course includes a brief introduction to game theory, and the primary industrial organisation models that use game theory, and core discipline courses cover these topics in depth. The following section discusses externalities, including network externalities and public goods. Then the remainder introduces information economics and contracting subjects, such as moral hazard, monopolistic screening, adverse selection, and signalling. Prerequisites for this course are intermediate microeconomics and multivariate calculus.

PhD Math Tutorials, a preparatory course, provides additional prerequisite math tools. Math Tutorials run independently of Microeconomics and intend to support several more technical PhD courses, but it is the closest to math tutorials. In economics, the prerequisite for this course is "intermediate" microeconomics (either as a second university course in economics or a high-level managerial economics course taught in a graduate business degree). We recommend that it is vital that students know the math but not necessarily that students have taken a calculus-based microeconomics course.

Evaluation for this core course is a PhD-level type of exam. In some cases, it requires a term paper to fulfil its requirements.



The Business School  
for the World®

## **PhD 503 Probability and Statistics I (A) + (B)**

Randomness appears everywhere, from finance to genetics to sociology. This course introduces probability, which is the mathematical study of randomness. Students will learn a rigorous and principled framework for thinking about randomness and tools to both models and study random phenomena. Afterwards, students will study statistics. In broad terms, where probability is the study of a given model, statistics focus on which model to choose based on past data. Both components are essential when working with and concluding, data. It will cover different parts of statistics, including point estimation, confidence intervals, and hypothesis testing.

The course aims to leave the students with a solid foundation in statistics for future classes and research endeavours.

Students will be given five assignments during the course (to be done individually) and a take-home exam at the end of the period.

## **PhD 504 Research Methodology**

Management research aims to generate knowledge that is directly or indirectly useful to stakeholders. Stakeholders include managers and those impacted by organisations (e.g. consumers) and those who affect organisations (e.g. policymakers).

This course is the first in the INSEAD PhD series. It concerns the researcher's most fundamental question: how does one generate helpful knowledge, whether in organisational behaviour, strategy, operations, finance, marketing, accounting, or any other management area?

The "how to do it" question can be subdivided into:

- What kinds of research are there?
- How does one evaluate the quality of a piece of research?
- What is the process a researcher goes through?
- What are the tools a researcher needs?

The first three questions fit the domain of a specialised field of inquiry, the philosophy of science. Research Methods abstracts the best, most relevant material from the philosophy of science and applies it to management. This constitutes approximately half the course. The other half concerns a critical research tool: data: what it is, what a researcher can do with it, how to get it, improve it, and assess its worth. Many of the later courses in the PhD program focus on imparting other tools the researcher needs.



The Business School  
for the World®

After Research Methods, students will have the knowledge to select which tools they will need to acquire as they formulate their research direction.

### **PhD 520 Social Theory**

Social Theory is an interdisciplinary seminar for doctoral students. It focuses on behavioural sciences, i.e., the areas of inquiry that relate to the human condition or behaviour. This definition encompasses various disciplines from the social sciences and humanities. The course will focus on sociology, economics, and management? with an emphasis on applications to organisations. Most of the course focuses on showing different approaches to constructing social theories. Along the way, the subject will cover some research topics and theories.

### **PhD 521 Introduction to Social Psychology**

The course introduces the class to "micro" level perspectives on analysing and conducting behavioural science research. The course focuses primarily on the field of social psychology. This primary disciplinary field addresses phenomena and research questions across various topics relevant to management. It complements the other "macro" perspective learned in P1 and will examine methodological, theoretical, and empirical issues.

The course has four goals: (1) Develop your ability to think about research from a psychological, micro-level perspective ; (2) Make you think about how to evaluate, conduct, and apply behavioural research, in particular, experimental research; (3) Survey the main topics in the field of social psychology, with a particular focus on classic papers. However, each week will include new developments or applied papers so students can see how ideas presented in classic papers have developed and evolved. (4) Provide an opportunity to develop and test ideas for own research from a micro-level behavioural science perspective.

The course will pursue these goals by examining a mix of theoretical and empirical research papers, thinking critically about their strengths and limitations, and creating a forum to test their ideas relating to their specialised areas of study.