

Programming Economic Experiments with z-Tree

Instructors: Urs Fischbacher and Katharine Bendrick

What is z-Tree?

Z-Tree is software for designing and conducting economic experiments. Its strengths lie in the following four points:

- New experiments are *rapidly* developed, simple experiments within hours.
- It is *easy* to conduct a session: There are established procedures for many features common in economic experiments, for instance for subject payment.
- z-Tree is *flexible*: You can design normal form games, extensive form games, posted offer markets, auction markets, questionnaires, and chat windows. There are standard user interface elements such as numeric input fields or radio buttons. Graphics display provides the option to display information in many different layouts.
- z-Tree is *safe*. All data is automatically saved.

Course description

In this course the main concepts will be presented in a lecture format, with each chapter followed by time for individual work. During practical exercises there will be assistance from the instructors; helping each other in groups is also encouraged. Please bring your own laptop with Windows or a Windows emulator.

The chapters of the course are:

Day 1 (beginner section)

Going to the lab: Everyone will participate in an experiment to see how an experiment is conducted in z-Tree. They will participate in a public goods game and fill out a z-Tree questionnaire.

Individual decision making: Experiments without interaction between subjects. In this section course participants will learn how to program payoff calculation in z-Tree. We will introduce the table structure of z-Tree, using the globals and the subjects tables.

Programming I: Symmetric normal form games. This unit gives a first overview of the structure of the program. Participants get a first impression of how to program and to run experiments with z-Tree by programming a public goods game.

Programming II: Layout & Asymmetric games. We will teach different ways of presenting information on the z-Leaf screen, and how to assign different types of decisions to experiment participants. As practice, course participants will program an ultimatum game.

Day 2 (beginner section)

Running a session: z-Tree is both a tool to program experiments as well as to conduct them. In this section subjects will be given an overview of how to conduct an experiment, including how to make questionnaires in z-Tree, how to deal with emergencies such as computer crashes, and how to use the data tools provided in z-Tree so that analysis is as simple as possible afterwards.

Markets and Auctions: This section introduces how to program a market environment. Examples are single sided auction markets, double auction markets, posted offer markets, and Dutch auctions.

Chat: Participants will learn how to program chat windows to allow controlled communication.

Graphic display: In this section we will introduce how to program visual aids in the form of pictures and graphs, how to use external movie, picture, or sound files with z-Tree.

Day 3 (advanced section)

Debugging and general approaches to programming will be emphasized in this session.

Advanced Features: Loops, arrays, the “later” command, using external programs, and the table loader. Subjects will program a quiz as an exercise.

Interactive Graphics: In this session we will continue using the graphic display, and additionally show how to interact with the graphics and use them as an input medium, so that variables can be modified using visual elements. Participants will be given several examples to program.

New features: How to use strings as variables, and other z-Tree developments, updates, and planned extensions will be presented.

Question, problem, and practice session: Concrete issues of participants will be addressed.

Schedule:

9:00-10:30	Going to the lab (with WiFi)	Kate
11:00-12:30	Individual decision making	Urs
1:30-3:00	Programming I	Kate
3:15-4:45	Programming II	Kate

9:00-10:30	Running a session	Kate
11:00-12:30	Markets & Auctions	Urs
1:30-2:30	Chat	Kate
3:00-4:00	Graphic display	Kate

9:00-10:30	Advanced features	Urs
11:00-12:30	Interactive graphics	Kate
1:30-2:30	New features	Urs
3:00-5:00	Question, problem, & practice session	Both