Discrete Choice Modeling
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This course will survey techniques used in modeling discrete data. Discrete choice models have become an essential tool in modeling individual behavior. The techniques are used in all social sciences, health economics, medical research, marketing research, transport research, and in a constellation of other disciplines. This course will examine a large number of models and techniques used in these studies. We will begin with a brief review of regression modeling concepts, then turn to the fundamental building block in discrete choice modeling, the binary choice model. Several variants and extensions will be discussed before we turn attention to multiple equation binary choice models, ordered choice models and models for counts. The second half of the course will be devoted to multinomial choice models of the sort used, e.g., in modeling brand choice in marketing, travel mode choice in transport, and a huge variety of applications in the social and behavioral sciences.

The course will include lectures that develop the relevant theory and extensive practical, laboratory applications. Emphasis in the laboratory sessions will be on estimation of discrete choice models and using them to describe behavior and to predict discrete outcomes. Course participants will apply the techniques on their own computers using the NLOGIT computer program and several 'real' data sets that have been used in applications already in the literature. NLOGIT is the leading computer program for this type of estimation, so students will have also studied the applications of the techniques using the modeling tools familiar to researchers in the area.

Prior knowledge is assumed to include calculus at the level assumed in the first year of a Ph.D. program in economics and a course in econometrics at the beginning Ph.D. level out of a textbook such as Greene, W., *Econometric Analysis, 6th* edition. Familiarity with NLOGIT will be helpful, but is not necessary. Two other useful reference books for the course are *Applied Choice Analysis* by David Hensher, John Rose and William Greene (Cambridge University Press, 2005) and Modeling Ordered Choices by William Greene and David Hensher (Cambridge University Press, 2010).

Students in this course will obtain background in both the theory and methods of estimation for discrete choice modeling. This course will provide a gateway to the professional literature as well as practical application of the methods at the level of the contemporary research in the field.