

Advanced Quantitative Methods in the Social Sciences (AQMSS) Certificate Core Requirements

Duke's Program for Advanced Research in the Social Sciences, housed within the Social Science Research Institute, offers the certificate in Advanced Quantitative Methods in the Social Sciences (AQMSS). The certificate requirements are as follows:

I. Basic Skills:

Mathematics and Mathematical Statistics: All candidates must demonstrate competence in basic mathematics, equivalent to completion of a basic course or series of courses in multivariate calculus, linear algebra, and probability theory through Statistics 611 or Economics 703.

Research Design: All need the equivalent of a course in the fundamental principles of research design, typically acquired through training within the home department, such as Political Science 731 or 732, Psychology 718S, or Sociology 720S and 702. In cases where a department does not list a distinctive course number, the PARISS Board will review application from the graduate student and DGS of the home department to demonstrate satisfaction of this requirement.

Formal Modeling and Derivation of Hypotheses: All need to achieve competence in formal modeling. The expectation is that the student will have training at least at the equivalent of a micro-economics course in economics. The most preferred course is Economics 705 depending on the applicant's objectives (e.g., Political Science 631, Psychology 749/750, Sociology 702, or Business Administration 513).

Hypothesis Testing: All need to achieve competence in the testing of hypotheses. This can be satisfied by successful completion of Statistics 831 or 601. In addition, applicants may ask that the board accept a disciplinary equivalent (currently taught examples include Economics 707, Political Science 630, Psychology 720, and Sociology 723).

II. Methodological Training for Substantive Expertise:

Disciplinary Base of Knowledge: Every social science scholar needs a well-defined base of substantive knowledge and needs to know how to derive and test hypotheses drawn from that knowledge base. Most certificate candidates achieve this goal by satisfying the requirements for testing in quantitative methodology in their home discipline. In the absence of satisfying this requirement within the degree-granting department (e.g., some social science units do not have a testing field in quantitative methods), the candidate for this certificate, in conjunction with his or her advisor or Director of Graduate Study, may demonstrate achievement of comparable knowledge. The PARISS Board of Advisors will judge the adequacy of the certificate student's achievement of this level of training.

III. Advanced Training in Social Science Methodology:

Advanced, Interdisciplinary Knowledge: The central concept of the certificate program is that the quantitative social sciences face common methodological problems and opportunities. Each discipline, however, focuses on differing substantive concerns, differing theories, and, often, differing emphases on kinds of data and research designs (randomized experiments, large n attitudinal surveys, multiple levels of measurement, etc.). As a result, each discipline develops specific methods for addressing methodological problems conventional to its substantive problems. The certificate program seeks to lower the barriers of discovery across disciplinary lines. To that end, the certificate candidate will take at least three courses outside their home discipline that build on the above core skills and learning, and that provide a coherent integration of theory construction and hypothesis testing. Ordinarily, the successful application will consist of a minimum of two courses – the equivalent of a year-long training – in one or more advanced, interdisciplinary topics of special interest to the student (all courses being outside the individual's own department and ordinarily unavailable within it), plus the PARISS capstone course. It is the responsibility of the student to provide in his or her application to the PARISS Board the rationale for the particular courses proposed and to demonstrate that, in combination with the remainder of his/her course work, this set of courses will provide a coherent integration of hypothesis development and testing.

Capstone Course: Annually, PARISS will sponsor a capstone course taught by an interdisciplinary team of scholars covering recent advances in quantitative methods for the social sciences. This course will be available to all advanced graduate students seeking Ph.D.s in any of the social and behavioral sciences, but is required of the certificate students. Because the course is expected to vary from year to year, it may be repeated for credit.