Ph.D. Applied Statistics Requirement

This document provides:

- A detailed specification of an Applied Statistics Requirement for Ph.D. students, and
- Background and discussion of particular elements of the Requirement.

The graduate program of the Department of Statistics at the University of Washington is based on a View of Statistics which includes the following statement: "Development of useful statistical methodology cannot take place in a vacuum. To be scientifically relevant this development should be problem-driven, motivated and guided by applications of scientific importance. Identifying and understanding important applications requires interaction with other disciplines that acquire and analyze data. Collaborative research is therefore essential to the viability and growth of Statistics.” (www.stat.washington.edu/graduate/view/index.shtml). With this view in mind, all Ph.D. students must satisfy an Applied Statistics Requirement consisting of two components:

1. **Satisfactory performance in Stat 599** (joint with Biostat 590)
2. A collaborative **Applied Data Analysis project** as delineated here.

   a. Prerequisite to approval to carry out an Applied Data Analysis project is completion of Stat 599.

   b. The student is responsible for finding a client with a real research problem involving a substantial data analysis component. Here "substantial" means a project of larger scope and time commitment than can be addressed by students in the regular consulting class, Stat 599. It should merit about 3 credits of independent study.

      - (i) Students will notify the consulting faculty when they are interested in taking on an Applied Data Analysis Project.

      - (ii) If, in the judgement of the faculty, a suitable Applied Data Analysis Project is not identified within two quarters of the date of notification, the student may petition to substitute a 2nd quarter of Stat 599 for this data analysis requirement and be given immediate priority for registration for Stat 599.

   c. The client must work in a field outside of Statistics or Biostatistics and the aim of the project should be a substantive scientific question in that field, not (principally) the development or demonstration of a statistical methodology for that field. The client cannot be a professional statistician, although a professional consulting statistician associated with the research project may be involved in a supervisory role in the same way that any other faculty member in the Statistics or Biostatistics may supervise as specified in part (e) below.

   d. The student must submit a written project proposal detailing the scientific aims of the analysis, the source of data, and the types of analyses and
statistical challenges anticipated. This proposal will typically be short and must be approved (by signature or email) by the client.

e. The project proposal must be approved by a faculty member in Statistics or Biostatistics who will serve as supervisor for the statistical aspects of the project. The student should register for 3 credits of Stat 600 with that faculty member.

f. The project will require a written report on the results of the analysis. There is no limit on the length of the report, but it must be written to address the scientific aims and needs of the client. It should generally follow the guidelines for written reports for the statistical consulting class (Stat 599), unless a different format is requested by the client. The report should ordinarily be submitted within one quarter of the date of approval of the project.

g. The student will make an oral presentation on the data analysis project. These will be open to the public (a fact to be made clear to the client at the time of the proposal) and may be scheduled at any time. Attendance of the client is highly recommended, but will not be required if circumstances prevent it.

h. The project, including the written report and oral presentation, must be approved by at least two faculty members from Statistics or Biostatistics, at least one of these being a faculty member in Statistics. Input from the client may be submitted, but the client will not have a formal vote on approval of the report to satisfy this requirement.

Further notes and background:

- **Reasons for the requirement:** In line with the View of Statistics cited in the introduction above, we view the experience of a substantial applied collaboration, including manuscript writing with and/or for a scientific client a valuable experience. Most students in the Stat 599 consulting class get an experience somewhat like this, but it is variable and not guaranteed. This requirement might be considered a replacement for the experience of the previous PhD Applied Prelim, but it is a much more comprehensive and realistic learning experience.

- **Recent history:** In recent years we have provided the option of substituting a substantial consulting project for the second quarter of the current/previous requirement of two quarters (6 cr) of Stat 599. The proposed new requirement above provides more specific detail on the nature and details of the Applied Data Analysis Project and it makes this previous option the default requirement.

- **Finding clients and research problems:** While it is the student’s responsibility to find a suitable client and research project, this should not be too difficult. A substantial number of suitable projects are likely to arise from clients of the regular consulting class (Stat 599/Biostat 590) who have data analysis projects that are too large and require too much ongoing collaboration to be handled in the consulting class. A few such projects seem to arise each quarter. However, students may find projects on
their own and they will be encouraged to consult with other Stat and Biostat faculty for possible projects. Note the conditional alternative requirement specified in point 2b(ii) in the event that a suitable project cannot be identified in a reasonable amount of time.

- **Paid compensation for work carried out for the Applied Data Analysis Requirement:** Students are permitted (but not required) to be paid for the work they do on this data analysis project. Paid work may be carried out either under an RA, usually in the client’s department, or for hourly wages paid through the Department of Statistics Center for Statistical Consulting. International students should consult with the University of Washington International Student Services office (iss.washington.edu) regarding opportunities and constraints on payment for work satisfying this consulting requirement.

- **Petitioning for satisfying this requirement based on other work experience:** Like any other requirement, students can petition for a waiver of this requirement based on previous or other proposed consulting work experience. However, waivers are unlikely to be given for work experience or internships initiated after a student has begun his graduate career in Statistics at the U.W. without prior approval of a submitted proposal as detailed above.

- **M.S. Applied Exam Requirement:** An approved Applied Data Analysis project may be used to satisfy the M.S. Applied Exam requirement. This option is likely to make sense only for Ph.D. students looking to also satisfy the M.S. requirements. M.S. students not continuing to a Ph.D. should find the M.S. Applied Exam an easier requirement to satisfy.