

## BIostatISTICS M.S.

All students must meet the Requirements for the Master's Degree

### OVERVIEW

The program offers a concentration in biostatistics leading to the M.S. degree.

Emphasis is placed on learning how to design studies and perform data analysis as the statistician in a research team. The curriculum takes full advantage of courses taught in the Statistics Program and includes potential experience in a variety of health, biomedical, natural resource and other research projects in the College of Medicine or other departments of UVM. This experience is designed to provide candidates with opportunities to use their academic training and work experience in defining research problems, formulating rational methods of inquiry, and gathering, analyzing, and interpreting data.

The program has close ties with the College of Medicine's Department of Medical Biostatistics and Bioinformatics, whose research activities cover the full range of studies that take place within an academic medicine environment. These include population-based health surveys of various types and evaluations of health promotion programs and professional education activities, such as community intervention studies to prevent smoking and to promote breast cancer screening. They also include clinical studies of many different interventions, bioengineering experiment design and measurement studies, statistical genetics, as well as data from other preclinical, clinical, and epidemiological studies.

Opportunities are also available for biostatistical research related to problems in agriculture and the life sciences, as well as natural resources and the environment. Opportunities could include multivariate or spatial data analyses for ongoing wildlife and water quality studies, for example. All students gain research and consulting experience through the research requirement: a research project (STAT 6810) or a thesis (STAT 6391). Other opportunities for experience may arise through involvement in the Statistical Consulting Clinic (STAT 6850). (See also Statistics Program and Statistical Consulting Clinic descriptions.)

### SPECIFIC REQUIREMENTS

#### Requirements for Admission to Graduate Studies for the Degree of Master of Science

An undergraduate major which provides a foundation for the application of statistical methodology and concepts to health and biomedical or agriculture/natural resource problems. For example, premedicine majors who have delayed their application to medical school will be well suited for the program. It is expected that candidates will have completed three semesters of calculus and a course including matrix algebra methods. Also they will have a solid introductory course in statistics (like STAT 2830) and a course including undergraduate probability (like STAT 2510). However, provisional admission to the program can be given prior

to the completion of these mathematics and statistics requirements. Computer programming experience is desirable. Satisfactory scores on the general (aptitude) portion of the Graduate Record Examination are required. Current undergraduate students at the University of Vermont should contact the program director for details on the Accelerated Master's Program.

#### Minimum Degree Requirements for the Degree of Master of Science

Requirement Description		Credits
Option A (Thesis)		
A 30 credit program requiring 24 credits of course work, at least 6 of which must be graded and at the 6000-level. The program must include:		
STAT 5000	Biostatistics and Epidemiology	3
STAT 5210	Advanced Stat Methods & Theory	3
STAT 5230	Appld Multivariate Analysis	3
STAT 5310	Experimental Design	3
STAT 5510	Probability Theory	3
6 credits of approved thesis research (STAT 6391)		6

Requirement Description		Credits
Option B (Non-Thesis)		
A 30 credit program requiring 27 credits of course work, at least 6 of which need to be graded and at the 6000-level or above. The program must include:		
STAT 5000	Biostatistics and Epidemiology	3
STAT 5210	Advanced Stat Methods & Theory	3
STAT 5230	Appld Multivariate Analysis	3
STAT 5310	Experimental Design	3
STAT 5510	Probability Theory	3
The research project requirement is met by taking 3 credits of:		
STAT 6810	Statistical Research	3
or STAT 6850	Consulting Practicum	

Requirement Description	Credits
Both Options	
Under both plans, students must attend the regular colloquium series and participate in the Statistics Student Associate Journal Club as part of their training. The comprehensive examination covers knowledge acquired in the core courses of the program. Under the non-thesis option, students will be expected to take major responsibility for a comprehensive data analysis or methodological research project, and are encouraged to present the results from the project.	

### Comprehensive Examination

The comprehensive exam is a 3-hour exam that includes a mixture of questions spanning theoretical and applied statistics, probability, study design, and interpretation of analytical results. The questions are formatted as either numerical computation, derivation, or essay. The student can take the exam a maximum of 2 times. The exam is based on the courses STAT 5210, STAT 5230, STAT 5310, and STAT 5510. The exam is given at the end of August and should be taken at the end of the first year.

### Requirements for Advancement to Candidacy for the Degree of Master of Science

Successful completion of any prerequisite courses, and at least 15 graded graduate credits earned in compilation of the graduate GPA, including all core courses. A GPA of 3.0 or greater is also required.