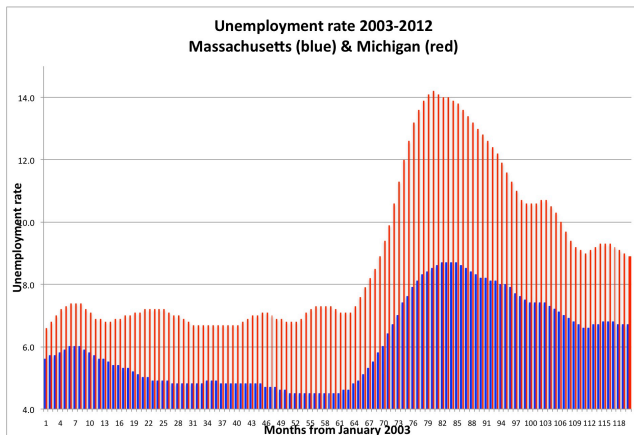## What courses should I take?

Among the courses required for a mathematics major the following are especially important for students concentrating on applied statistics:

- MTH 104 - Fundamentals of Statistics
- MTH 181 - Introduction to Discrete Structures I
- MTH 182 - Introduction to Discrete Structures II
- MTH 111 - Analytic Geometry and Calculus I
- MTH 112 - Analytic Geometry and Calculus II
- MTH 211 - Analytic Geometry and Calculus III
- MTH 204 - Computational Experiments in Mathematics
- MTH 212 - Differential Equations I
- MTH 221 - Linear Algebra
- MTH 231 - Elementary Statistics I: Exploratory Data Analysis
- MTH 232 - Elementary Statistics II: Time Series Analysis
- MTH 280 - Introduction to Scientific Programming
- MTH 331 - Probability
- MTH 332 - Mathematical Statistics
- MTH 353 - Applied Linear Algebra
- MTH 361 - Numerical Analysis I

Unemployment rate 2003-2012
Massachusetts (blue) & Michigan (red)

Students are encouraged from their Freshman year to become involved in research. Experienced faculty act as research mentors to students on original research objects. Commonly students work on research projects in groups and learn to use computational software, the mathematical typesetting software LaTeX, and learn to present their work to others.

Data Science

The Department of Mathematics is developing an interdisciplinary Bachelor of Science and Master of Science in Data Science, one of the hottest new areas for employment. Students learn data mining, analysis, modeling & visualization applied to Big Data. The Department is collaborating with computer science, business, and other areas of science & engineering to develop an interdisciplinary degree in Data Science that prepares graduates to work in this exciting and explosive growth area.
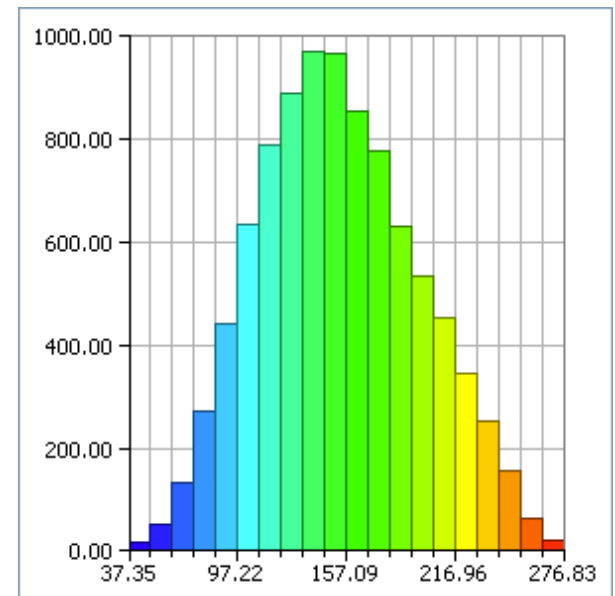

Data Analysis Group

UMass Dartmouth has an active Data Analysis Group consisting of faculty, students & administrators who are actively engaged in data analysis, for purposes of scientific research, institutional research, or education & training. The Data Analysis Group brings together diverse members of the University who are connected through their engagement with, and interest in, data and data analysis & visualization.

UMass | Dartmouth

Department of Mathematics

http://www.umassd.edu/cas/math/

Applied Statistics

What is Applied Statistics?

Applied Statistics is essentially statistical methods and techniques applied to some other field such as medicine, science, engineering, social science, political science, or business.

People often work in applied statistics without being called "statistician" - a term that's often used for someone with a Master's degree or Ph.D. in statistics.

Examples of applied statisticians:

- **Statistician:** design surveys & experiments; collect process, & analyze of data; interpretation experiments & survey results.
- **Forecasting Strategist:** analyze large amounts of data to draw out key insights and develop analytic models for forecasting.
- **Data Mining Analyst:** predictive forecasting, data manipulation & transformation, gathering & normalizing data, statistical analysis, creation of metrics for reporting purposes, presentation to management & creation of recommendations based on data analysis.
- **Data Analyst:** Organizing data in order to distinguish patterns & recognize trends; translate into technical specifications for the development by quality assurance teams.
- **Biostatistician:** design research studies and analyze data related to human health, animals or plants. Use optimal analysis methodology & data presentation techniques. Translate problems into mathematical forms & use state-of-the-art modeling techniques to provide solutions.
- **Epidemiologist:** use mathematical models to track progress of infectious diseases, help discover likely outcome of an epidemic.
- **Market Research Analyst:** analyze data on past sales to predict future sales; gather data on competitors and analyze prices, sales, & methods of marketing & distribution; devise methods and procedures for collecting data; evaluate consumer data.

Careers in Applied Statistics

From: American Statistical Association

Medicine
Statisticians work with medical teams to design experiments and analyze the complex data they produce.

Environment
Studies of the environment require data on the abundance and location of plants and animals, on the spread of pollution from its sources, and on possible effects of changes in human activities.

Industry
More companies are installing elaborate systems to collect and act on data to better serve their customers.

Government Surveys
How many people are unemployed this month? What do we export to China, and what do we import? Are rates of violent crime increasing or decreasing? Statistics agencies provide data on these issues by surveys of households & businesses.

Market Research
Are consumer tastes in television programs changing? What are promising locations for a new retail outlet? Statisticians design surveys that gather data for public & private use.

What do applied statisticians earn?

Examples of entry level through higher level annual salaries for various applied statistics careers:

CAREER	ENTRY	MEDIAN	ADVANCED
Statistician	$39,840	$73,880	$199,710
Biostatistician	$38,430	$72,820	$117,210
Epidemiologist	$40,860	$63,010	$98,380
Market Research Analyst	$33,350	$60,570	$111,440
Data Analyst	$56,000	$73,000	$85,000
Data Mining Analyst	$27,000	$54,151	$122,144

Who will hire me ?

"*Most statisticians enter the occupation with a master's degree in statistics, mathematics, or survey methodology, although a bachelor's degree is sufficient for some entry-level jobs. Research and academic jobs generally require a Ph.D.*"
Source: Bureau of Labor Statistics

The federal government employs 20% of the approximately 19,000 statisticians in the United States working on survey design & methodology, field work & data analysis, clinical trial analysis, reliability & quality control:

- U.S. Food and Drug Administration
- Bureau of Labor Statistics
- U.S. Department of Agriculture
- U.S. Census Bureau
- National Institutes of Health
- Centers for Disease Control and Prevention

A small sample of companies employing statisticians & data analysts:

JPMorgan Chase, Capital One, Westat, FairIsaac, SAS, Insightful, Wolfram, SPSS, D.E.Shaw, Google, Yahoo, Microsoft, Intuit, Exponent, Quintiles, William Wecker Associates, Travelers, Merck, GlaxoSmithKline, Rand, Oracle, Data Mining International, Ebay, Amazon, VistaPrint, inVentiv Clinical Solutions, Icon Clinical Research, T-Mobile, Expedia, REI, Classmates

How do I find jobs in Applied Statistics?

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