# Statistics

## Freshman Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 1371 Calculus I (placement into course, or pre-req)</td>
<td>Math 1372 Calculus II (1371)</td>
</tr>
<tr>
<td>Lab Science †</td>
<td>Lab Science †</td>
</tr>
<tr>
<td>Lib Ed or Writ 1301/1401</td>
<td>Lib Ed or Writ 1301/1401</td>
</tr>
<tr>
<td>Liberal Education course</td>
<td>Liberal Education course</td>
</tr>
<tr>
<td>CSE 1001: 1st Yr Experience</td>
<td>1</td>
</tr>
</tbody>
</table>

## Sophomore Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 2374 Multivariable Calc (1372)</td>
<td>Math 2373 Lin Alg/Diff Eq. (1372)</td>
</tr>
<tr>
<td>Stat 3011 Intro to Stat Analysis or Stat 3021 Intro to Prob and Stat (Math 1372)</td>
<td>Stat 3022 Data Analysis or Stat 3032 Regression (3011)</td>
</tr>
<tr>
<td>CSci 1113 Intro to C/C++ (Math 1371)</td>
<td>Lab Science †</td>
</tr>
<tr>
<td>Open Elective</td>
<td>Open Elective</td>
</tr>
</tbody>
</table>

† Stats majors need three science courses taken A-F, usually chosen from Biol topic, Chem 1061/65-1062/66, or Phys 1301W-1302W

## Junior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 4242 Applied Lin Alg (2373)</td>
<td>Stat 5102 Theory of Stat II ♠ (5101 or Math 5651)</td>
</tr>
<tr>
<td>Stat 5101 Theory of Stat I ♠ (Math 2374)</td>
<td>Statistics Elective ◊</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>Statistics Elective ◊</td>
</tr>
<tr>
<td>Liberal Education course</td>
<td>Liberal Education course</td>
</tr>
</tbody>
</table>

♦ or Stat 4101-4102, offered only Fall and Spring, respectively

## Senior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat 4893W Senior Paper (Stat major)</td>
<td>Technical Elective</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>Statistics Elective ◊</td>
</tr>
<tr>
<td>Open Elective (if required to reach 120 credits)</td>
<td>Open Elective (if required to reach 120 credits)</td>
</tr>
</tbody>
</table>

♦ Stat 5302 is strongly recommended for a Statistics Elective

## About This Plan
- This plan is not a contract. Curriculum can change.
- Beginning fall 2015, CSE Statistics students cannot use credit for both Stat 3011 and 3021 for their major.
- Shaded courses are only offered in the indicated semester.
- Course pre-requisites and co-requisites (designated by &) are listed below the course number and title.
- Students can take either the CSE-only or University-wide versions of the math course (Math 1371/1271, 1372/1272, 2373/2243, 2374/2263).
- Double boxed courses, along with one of two courses with a dashed outline, are required for application to this major.
- Liberal Education and Writing requirements with an (*) will be fulfilled by taking courses required for this major at UM-TC.

## Department Contact Information
- Website: www.stat.umn.edu/ugrad/
- Main Phone: 612-625-8046
- Main Office: 313 Ford Hall
- Director of Undergraduate Studies: Prof. Adam Rothman
- Department Advisor: John Edmonds
- Email: undergrad@stat.umn.edu

## University Degree Requirements
All students must complete the following Writing & Liberal Education requirements, as noted on their APAS report. See link for full Core & Theme names: z.umn.edu/liberaleducation

<table>
<thead>
<tr>
<th>Writing Requirements</th>
<th>Liberal Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Writing:</td>
<td>CORES:</td>
</tr>
<tr>
<td>Writ 1301/1401 or equivalent</td>
<td>Bio</td>
</tr>
<tr>
<td>Writing Intensive (WI):</td>
<td>Phy*</td>
</tr>
<tr>
<td>Two: 1xxx or 2xxx level</td>
<td>His</td>
</tr>
<tr>
<td>One: 3/4/5xxx level (in major)*</td>
<td>SocS</td>
</tr>
<tr>
<td>One: 3/4/5xxx level (any dept.)</td>
<td>Env</td>
</tr>
<tr>
<td></td>
<td>Ltr</td>
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<tr>
<td></td>
<td>AH</td>
</tr>
<tr>
<td></td>
<td>Mth*</td>
</tr>
</tbody>
</table>

Total Credits Needed for Degree: 120
What can I do with a major in statistics?

Statistics enhances knowledge in the face of uncertainty through modeling, predictions, and decisions. It is central to finding solutions to problems in the environment, medicine, law, industry, technology, finance, business, public policy, computing, and science in general. The need for statistics applies to almost every area of our lives.

Statisticians contribute to scientific inquiry by designing surveys and experiments; collecting, processing, and analyzing data; and interpreting results. Statisticians may apply their knowledge of statistical methods to a variety of subject areas, such as biology, economics, engineering, medicine, public health, psychology, marketing, education, and sports. Many economical, social, political, and military decisions cannot be made without statistical techniques; for example, the design of experiments to gain federal approval of a newly manufactured drug. Statistical procedures based on scientific sampling have become basic tools in diverse fields as weather forecasting, opinion polling, biological and agricultural estimation, and business trend prediction. Statisticians are in demand wherever quantitative studies are conducted.

While some jobs related to statistics only require a bachelor’s degree, many research oriented jobs require advanced degrees.

Employers (sample listing)

- Cetero Research
- Towers Watson
- OptiMetrics, Inc.
- Stat-Ease
- DCM
- Intel Corporation
- Pearson VUE
- Travelers
- Express Scripts
- MN Dept. of Revenue
- Questar Assessment, Inc.
- US Bank
- PricewaterhouseCoopers
- Nash Finch Company
- Sanford Health
- US Bank
- Northwestern Mutual
- Nonin Medical, Inc.
- Allianz Life
- Xcel Energy
- Accenture

Industries (sample listing)

- Agriculture
- Epidemicology
- Management
- Consulting
- Government
- Banking
- Financial services
- Manufacturing
- Public health
- Biostatics
- Environmental consulting
- Research
- Higher education
- Marketing
- Quality improvement
- Sports
- Computer information technology
- Database marketing
- Pharmaceuticals
- Insurance
- Clinical trials
- Environmental research
- Product reliability
- Law

Positions (sample listing)

- Statistician: Applies mathematical and statistical knowledge to the design of surveys and experiments.
- Actuary: Deals with the financial impact of risk and uncertainty. Actuaries mathematically evaluate the likelihood of events and quantify the contingent outcomes in order to minimize losses.
- Budget Analyst: Develops, analyzes, and executes budgets, as well as estimates future financial needs for private businesses, nonprofit organizations, and government agencies.
- Mathematician: Uses mathematical theory, computational techniques, algorithms, and the latest computer technology to solve economic, scientific, engineering, and business problems.
- Insurance Underwriter: Decides whether insurance is provided and under what terms. Insurance underwriters identify and calculate the risk of loss from policyholders, establish who receives a policy, determine the appropriate premium, and write policies that cover this risk.
- Management Analyst: Analyzes and proposes ways to improve an organization’s structure, efficiency, and profits.
- Production Analyst: Analyzes systems, reviews production work orders to ensure accuracy, completes weekly and monthly production activity reports, and resolves inventory imbalances.
- Actuary Scientist: Responsible for assessing the risk involved with various business initiatives.
- Associate Scientist: Plays a role in collecting and analyzing statistical data on scientific research projects.
- Statistical Consultant: Works with companies and organizations to analyze research and data.
- Management Analysis: Studies and analyzes business-related problems, synthesizes information from many sources, and recommends solutions.
- Database Administrator: Works with database software to develop and implement ways to manage and store data.
- Survey Researcher: Gathers information and statistical data to help companies understand what types of products people want, who will buy them, and at what price.
- Operations Research Analyst: Helps managers make better decisions and solve problems through applying mathematical modeling methods to develop, interpret, and implement information.
- Economist: Studies how society distributes resources to produce goods and services. Economists conduct research to develop forecasts on a wide variety of issues, including energy costs, inflation, interest rates, exchange rates, business cycles, taxes, employment levels and more.

Examples from: “Occupational Outlook Handbook” and O*NET Online.

*Some positions may require an advanced degree.