STATISTICS, MATHEMATICS (BS)

Degree: Bachelor of Science
Major: Mathematics
Concentration: Statistics
Program Code: 3434

About This Major . . .

The statistics concentration in mathematics prepares students for graduate work in statistics or to enter the job force. With some additional job-specific training, students entering the job market could function as applied statisticians working in areas such as actuarial science, wildlife management, marketing, quality control, and epidemiology to name a few.

For more information on what you can do with this major, visit Career Services’ What to Do with a Major? resource.

All CMU baccalaureate graduates are expected to demonstrate proficiency in specialized knowledge/applied learning, quantitative fluency, communication fluency, critical thinking, personal and social responsibility, and information literacy. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

a. Construct multi-step problem-solving strategies and communicate solutions effectively in written form. (Specialized Knowledge, Quantitative Fluency)
b. Use statistical software (including calculators) to aid in problem-solving and investigation, and recognize its limitations. (Applied Learning, Critical Thinking)
c. Apply appropriate statistical procedures and defend chosen assumptions. (Applied Learning, Personal and Social Responsibility)
d. Draw statistical conclusions and evaluate the validity of others’ reported conclusions. (Critical Thinking, Information Literacy)
e. Investigate, discuss, and respond to ethical and social challenges in a mathematical context. (Communication Fluency, Personal and Social Responsibility, Information Literacy)
f. Perform advanced statistical analysis on real data and deliver written and oral presentations (Specialized Knowledge, Communication Fluency, Information Literacy)

Requirements

Each section below contains details about the requirements for this program. Select a header to expand the information/requirements for that particular section of the program’s requirements.

To print or save an overview of this program's information, including the program description, learning outcomes, requirements, suggested course sequencing (if applicable), and advising and graduation information, scroll to the bottom of the left-hand navigation menu and select "Print Options." This will give you the options to either "Send Page to Printer" or "Download PDF of This Page." The "Download PDF of This Page" option prepares a much more concise presentation of all program information. The PDF is also printable and may be preferable due to its brevity.

Institutional Degree Requirements

The following institutional degree requirements apply to all CMU baccalaureate degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 120 semester hours minimum.
- Students must complete a minimum of 30 of the last 60 hours of credit at CMU, with at least 15 semester hours in major discipline courses numbered 300 or higher.
- 40 upper-division credits (an alternative credit limit applies to the Bachelor of Applied Science degree).
- 2.00 cumulative GPA or higher in all CMU coursework.
- A course may only be used to fulfill one requirement for each degree/certificate.
- No more than six semester hours of independent study courses can be used toward the degree.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed 30 semester credit hours for a baccalaureate degree. A maximum of 15 of the 30 credits may be for cooperative education, internships, and practice.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- Capstone exit assessment/projects (e.g., Major Field Achievement Test) requirements are identified under Program-Specific Degree Requirements.
- The Catalog Year determines which program sheet and degree requirements a student must fulfill in order to graduate. Visit with your advisor or academic department to determine which catalog year and program requirements you should follow.
- See “Requirements for Undergraduate Degrees and Certificates” in the catalog for a complete list of graduation requirements.

Essential Learning Requirements

(31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is an Essential Learning option and a requirement for your major, you must use it to fulfill the major requirement and make a different selection for the Essential Learning requirement.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 111</td>
<td>English Composition I-GTCO1</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 112</td>
<td>English Composition II-GTCO2</td>
<td>3</td>
</tr>
<tr>
<td>MATH 151</td>
<td>Calculus I-GT-MA1</td>
<td>3</td>
</tr>
<tr>
<td>History</td>
<td>Select one History course</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>Select one Humanities course</td>
<td>3</td>
</tr>
<tr>
<td>Social and Behavioral Sciences</td>
<td>Select one Social and Behavioral Sciences course</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>Select one Social and Behavioral Sciences course</td>
<td>3</td>
</tr>
</tbody>
</table>

(31 semester hours)
Select one Fine Arts course 3

Natural Sciences
Select one Natural Sciences course 3
Select one Natural Sciences course with a lab 4

Total Semester Credit Hours 31

1 Must receive a grade of "C" or better and must be complete by the time the student has 60 semester hours.
2 This is a 5 credit course. 3 credits apply to the Essential Learning requirements and 2 credits apply to electives.

Other Lower Division Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>KINE 100</td>
<td>Health and Wellness</td>
<td>1</td>
</tr>
<tr>
<td>Select one Activity course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ESSL 290</td>
<td>Maverick Milestone</td>
<td>3</td>
</tr>
<tr>
<td>ESSL 200</td>
<td>Essential Speech</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Semester Credit Hours 6

1 Essential Learning Capstone must be taken after completion of the Essential Learning English and Mathematics requirements, and when a student has earned between 45 and 75 hours.

Foundation Courses
(8 semester hours)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 152</td>
<td>Calculus II</td>
<td>5</td>
</tr>
<tr>
<td>STAT 200</td>
<td>Probability and Statistics-GTMA1</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Semester Credit Hours 8

Program Specific Degree Requirements
(45-47 semester hours. A 2.5 cumulative GPA is required in the major courses. At most one "D" may be used in completing major requirements.)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 130</td>
<td>Introduction to Engineering Computer Science</td>
<td></td>
</tr>
<tr>
<td>CSCI 260</td>
<td>Introduction to Database</td>
<td>3</td>
</tr>
<tr>
<td>STAT 301</td>
<td>Computational Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 312</td>
<td>Correlation and Regression</td>
<td>3</td>
</tr>
<tr>
<td>STAT 350</td>
<td>Mathematical Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 351</td>
<td>Mathematical Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>STAT 425</td>
<td>Design and Analysis of Experiments</td>
<td>3</td>
</tr>
</tbody>
</table>

Concentration Electives
Select one of the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 240</td>
<td>Introduction to Advanced Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 369</td>
<td>Discrete Structures I</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose three courses from the following groups: 1 9-10

Group A
- STAT 313 | Sampling Techniques          | 3                     |
| STAT 430 | Categorical Data Analysis    | 3                     |
| STAT 435 | Introduction to Time Series  | 3                     |

Group B
- MATH 361 | Numerical Analysis           | 3                     |
| MATH 362 | Fourier Analysis             | 3                     |
| MATH 365 | Mathematical Modeling        | 3                     |

Total Semester Credit Hours 45-47

1 At least two courses must be from Group A and the third course may be from Group A or Group B.

General Electives
All college level courses appearing on your final transcript, not listed above that will bring your total semester hours to 120 hours. 28-30 semester hours, 9-13 additional upper division hours may be needed.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 151</td>
<td>Calculus I-GT-MA1</td>
<td>2</td>
</tr>
</tbody>
</table>

Select additional electives 26-28

Total Semester Credit Hours 28-30

Suggested Course Plan
While the sequencing below culminates in a total of 118-122 semester credit hours, students must complete a minimum of 120 semester credit hours as required for completion of this degree, including satisfactory completion of all required courses. Plan to complete requirements with varying hour options accordingly.

First Year
Fall Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 111</td>
<td>English Composition I-GTC01</td>
<td>3</td>
</tr>
<tr>
<td>KINE 100</td>
<td>Health and Wellness</td>
<td>1</td>
</tr>
<tr>
<td>MATH 151</td>
<td>Calculus I-GT-MA1</td>
<td>5</td>
</tr>
<tr>
<td>MATH 225</td>
<td>Computational Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 240</td>
<td>Introduction to Advanced Mathematics</td>
<td></td>
</tr>
<tr>
<td>MATH 253</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 361</td>
<td>Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 362</td>
<td>Fourier Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 365</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
</tbody>
</table>

Semester Credit Hours 16
Spring Semester
Select one of the following: 4
CSCI 110  Beginning Programming
& 110L  and Beginning Programming Laboratory
CSCI 111  CS1: Foundations of Computer Science
CSCI 130  Introduction to Engineering Computer Science
ENGL 112  English Composition II-GTCO2 3
Essential Learning - Social and Behavioral Sciences 3
MATH 150  Topics and Careers in Mathematics 1
MATH 152  Calculus II 5

Semester Credit Hours 16

Second Year
Fall Semester
Essential Learning - Fine Arts 3
Essential Learning - History 3
General Elective 3
MATH 253  Calculus III 4
STAT 200  Probability and Statistics-GTMA1 3

Semester Credit Hours 16

Spring Semester
CSCI 260  Introduction to Database 3
Essential Learning - Natural Science with Lab 4
MATH 225  Computational Linear Algebra 3
MATH 240  or MATH 369  Introduction to Advanced Mathematics
or Discrete Structures I 3-4

Semester Credit Hours 13-14

Third Year
Fall Semester
STAT 301  Computational Statistics 3
STAT 350  Mathematical Statistics I 3
Essential Learning - Humanities 3
ESL 200  Essential Speech 1
ESL 290  Maverick Milestone 3
General Elective 3

Semester Credit Hours 16

Spring Semester
Concentration Elective from Group A or B 3
General Electives 6
STAT 312  Correlation and Regression 3
STAT 351  Mathematical Statistics II 3

Semester Credit Hours 15

Fourth Year
Fall Semester
Concentration Elective from Group A or B 3-4
General Electives 6
MATH 492  Senior Capstone 3
STAT 425  Design and Analysis of Experiments 3

Semester Credit Hours 15-16

Spring Semester
Concentration Elective from Group A or B 3
General Electives 8-10

Semester Credit Hours 11-13

Total Semester Credit Hours 118-122

Advising and Graduation
Advising Process and DegreeWorks

Some courses are critical to complete in specific semesters, while others may be moved around. Meeting with an academic advisor is essential in planning courses and altering the suggested course sequencing. It is ultimately the student’s responsibility to understand and fulfill the requirements for her/his intended degree(s).

DegreeWorks is an online degree audit tool available in MAVzone. It is the official record used by the Registrar’s Office to evaluate progress towards a degree and determine eligibility for graduation. Students are responsible for reviewing their DegreeWorks audit on a regular basis and should discuss questions or concerns with their advisor or academic department head. Discrepancies in requirements should be reported to the Registrar’s Office.

Graduation Process

Students must complete the following in the first two months of the semester prior to completing their degree requirements:

- Review their DegreeWorks audit and create a plan that outlines how unmet requirements will be met in the final semester.
- Meet with their advisor and modify their plan as needed. The advisor must approve the final plan.
- Submit the ”Intent to Graduate” form to the Registrar’s Office to officially declare the intended graduation date and commencement ceremony plans.
- Register for all needed courses and complete all requirements for each degree sought.

Submission deadlines and commencement details can be found at http://www.coloradomesa.edu/registrar/graduation.html.

If a student's petition for graduation is denied, it will be her/his responsibility to consult the Registrar's Office regarding next steps.

Advising and Graduation
Advising Process and DegreeWorks

Documentation on the pages related to this program is intended for informational purposes to help determine what courses and associated requirements are needed to earn a degree. The suggested course sequencing outlines how students could finish degree requirements.