STATISTICS, DOCTORAL MINOR

REQUIREMENTS

GENERAL REQUIREMENTS FOR AN OPTION-A MINOR IN STATISTICS FOR GRADUATES:

Please carefully read the requirements below. Requests for further information should be addressed to the faculty member acting as minor program advisor in the Department of Statistics. Note: Candidates for an Option A Minor in statistics must be aware of the Graduate School "Minors" policy (https://grad.wisc.edu/acadpolicy/#minors).

STATISTICS MINOR OPTION FOR GRADUATES

For admission for an Option A Minor in statistics, the candidate must have had at least one year of calculus, and an introductory knowledge of statistics that is satisfactory to the department. Any of the following (or an equivalent course) is sufficient for this purpose:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 301</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 302</td>
<td>Accelerated Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 324</td>
<td>Introductory Applied Statistics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences</td>
<td>3</td>
</tr>
<tr>
<td>STAT/F&amp;W ECOL/HORT 571</td>
<td>Statistical Methods for Bioscience I</td>
<td>4</td>
</tr>
</tbody>
</table>

Students must take at least four courses acceptable for the minor totaling at least 12 credits. Courses acceptable for the minor are:

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>STAT/MATH 309 &amp; STAT/MATH 310</td>
<td>Introduction to Probability and Mathematical Statistics I and Introduction to Probability and Mathematical Statistics II</td>
<td>6</td>
</tr>
<tr>
<td>STAT/MATH 310</td>
<td>Introduction to Probability and Mathematical Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>STAT 311 &amp; STAT 312</td>
<td>Introduction to Theory and Methods of Mathematical Statistics I and Introduction to Theory and Methods of Mathematical Statistics II</td>
<td>6</td>
</tr>
<tr>
<td>STAT 312</td>
<td>Introduction to Theory and Methods of Mathematical Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>STAT 327</td>
<td>Learning a Statistical Language</td>
<td>1</td>
</tr>
<tr>
<td>STAT 333</td>
<td>Applied Regression Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 349</td>
<td>Introduction to Time Series</td>
<td>3</td>
</tr>
<tr>
<td>STAT 351</td>
<td>Introductory Nonparametric Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 411</td>
<td>An Introduction to Sample Survey Theory and Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 421</td>
<td>Applied Categorical Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT/M E 424</td>
<td>Statistical Experimental Design</td>
<td>3</td>
</tr>
<tr>
<td>STAT 456</td>
<td>Applied Multivariate Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 461</td>
<td>Financial Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT/COMP SCI 471</td>
<td>Introduction to Computational Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 479</td>
<td>Special Topics in Statistics</td>
<td>1-3</td>
</tr>
<tr>
<td>STAT/B M I 542</td>
<td>Introduction to Clinical Trials I</td>
<td>3</td>
</tr>
<tr>
<td>STAT/F&amp;W ECOL/HORT 572</td>
<td>Statistical Methods for Bioscience II</td>
<td>4</td>
</tr>
<tr>
<td>STAT 575</td>
<td>Statistical Methods for Spatial Data</td>
<td>3</td>
</tr>
<tr>
<td>STAT 609 &amp; STAT 610</td>
<td>Mathematical Statistics I and Introduction to Statistical Inference</td>
<td>7</td>
</tr>
<tr>
<td>STAT 610</td>
<td>Introduction to Statistical Inference</td>
<td>4</td>
</tr>
<tr>
<td>STAT/B M I 641</td>
<td>Statistical Methods for Clinical Trials</td>
<td>3</td>
</tr>
<tr>
<td>STAT 679</td>
<td>Special Topics in Statistics</td>
<td>1-3</td>
</tr>
<tr>
<td>STAT/MATH 709</td>
<td>Mathematical Statistics</td>
<td>4</td>
</tr>
<tr>
<td>STAT/MATH 710</td>
<td>Mathematical Statistics</td>
<td>4</td>
</tr>
<tr>
<td>STAT 732</td>
<td>Large Sample Theory of Statistical Inference</td>
<td>3</td>
</tr>
<tr>
<td>STAT/B M I 741</td>
<td>Survival Analysis Theory and Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 760</td>
<td>Multivariate Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 761</td>
<td>Decision Trees for Multivariate Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 771</td>
<td>Statistical Computing</td>
<td>3</td>
</tr>
<tr>
<td>STAT/ECON/GEN BUS 775</td>
<td>Introduction to Bayesian Decision and Control I</td>
<td>3</td>
</tr>
<tr>
<td>STAT/MATH 803</td>
<td>Experimental Design I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 809</td>
<td>Non Parametric Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 811</td>
<td>Sample Survey Theory and Method</td>
<td>3</td>
</tr>
<tr>
<td>STAT 834</td>
<td>Empirical Processes and Semiparametric Inference</td>
<td>1-3</td>
</tr>
<tr>
<td>STAT 840</td>
<td>Statistical Model Building and Learning</td>
<td>3</td>
</tr>
<tr>
<td>STAT 841</td>
<td>Nonparametric Statistics and Machine Learning Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 849</td>
<td>Theory and Application of Regression Analysis of Variance I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 850</td>
<td>Theory and Application of Regression Analysis of Variance II</td>
<td>3</td>
</tr>
<tr>
<td>STAT 860</td>
<td>Estimation of Functions from Data</td>
<td>3</td>
</tr>
<tr>
<td>STAT/B M I 877</td>
<td>Statistical Methods for Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>STAT 992</td>
<td>Seminar</td>
<td>1-3</td>
</tr>
</tbody>
</table>

A student can include at most one of 309, 609, and 709, and at most one of 310, 610, and 710. The courses taken by a particular student should depend on the student's major field or individual needs.
Besides these courses, up to three credits from the following list are acceptable for the minor (or some other course in the university of suitable statistical content if approved by the minor program advisor in the Department of Statistics):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH/STAT 431</td>
<td>Introduction to the Theory of Probability</td>
<td>3</td>
</tr>
<tr>
<td>MATH/COMP SCI/STAT 475</td>
<td>Introduction to Combinatorics</td>
<td>3</td>
</tr>
<tr>
<td>MATH/I SY E/OTM/STAT 632</td>
<td>Introduction to Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>MATH/STAT 833</td>
<td>Topics in the Theory of Probability</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/I SY E/MATH/STAT 525</td>
<td>Linear Optimization</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/I SY E/MATH/STAT 726</td>
<td>Nonlinear Optimization I</td>
<td>3</td>
</tr>
</tbody>
</table>

The student should have a program of study approved by the minor program advisor in the Department of Statistics and the student's major professor, early in the student's graduate work. The proposed program should be submitted to and approved by the minor program advisor in statistics upon, or before, the completion of 6 credits.

The student must achieve a 3.00 GPA in courses used to satisfy the minor requirement.

### COURSES IN STATISTICS

#### Code | Title                                      | Credits |
---|--------------------------------------------|---------|

**Courses in Statistics**

**For majors in Mathematics & Statistics:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>STAT/MATH 309</td>
<td>Introduction to Probability and Mathematical Statistics I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; STAT/MATH 310</td>
<td>Introduction to Probability and Mathematical Statistics II</td>
<td>6</td>
</tr>
</tbody>
</table>

**For majors in Engineering, & the Natural, Agricultural and Life Sciences:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>STAT 311</td>
<td>Introduction to Theory and Methods of Mathematical Statistics I</td>
<td>6</td>
</tr>
<tr>
<td>&amp; STAT 312</td>
<td>Introduction to Theory and Methods of Mathematical Statistics II</td>
<td>6</td>
</tr>
</tbody>
</table>

**For all majors:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>STAT 327</td>
<td>Learning a Statistical Language</td>
<td>1</td>
</tr>
<tr>
<td>STAT 333</td>
<td>Applied Regression Analysis</td>
<td>3</td>
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<td>STAT/COMP SCI 471</td>
<td>Introduction to Computational Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 479</td>
<td>Special Topics in Statistics</td>
<td>1-3</td>
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**Courses Jointly Listed in Statistics & Mathematics or Computer Science**

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<tbody>
<tr>
<td>STAT/B M I 542</td>
<td>Introduction to Clinical Trials I</td>
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</tr>
<tr>
<td>STAT/B M I 641</td>
<td>Statistical Methods for Clinical Trials</td>
<td>3</td>
</tr>
<tr>
<td>STAT/B M I 642</td>
<td>Statistical Methods for Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>STAT 679</td>
<td>Special Topics in Statistics</td>
<td>1-3</td>
</tr>
<tr>
<td>STAT 701</td>
<td>Applied Time Series Analysis, Forecasting and Control I</td>
<td>3</td>
</tr>
<tr>
<td>STAT/MATH 709 &amp; STAT/MATH 710</td>
<td>Mathematical Statistics and Mathematical Statistics</td>
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<td>STAT 732</td>
<td>Large Sample Theory of Statistical Inference</td>
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<td>STAT 849 &amp; STAT 850</td>
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<td>6</td>
</tr>
<tr>
<td></td>
<td>and Theory and Application of Regression and Analysis of Variance II</td>
<td>6</td>
</tr>
<tr>
<td>STAT 860</td>
<td>Estimation of Functions from Data</td>
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<td>STAT/B M I 877</td>
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</tr>
<tr>
<td>STAT 992</td>
<td>Seminar</td>
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**STATISTICS, Doctoral Minor**

**Courses in Statistics**

**For majors in Mathematics & Statistics:**

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<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
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<td>MATH/STAT 431</td>
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<td>3</td>
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<th>Credits</th>
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</thead>
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<td>Topics in the Theory of Probability</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/I SY E/</td>
<td>Linear Optimization</td>
<td>3</td>
</tr>
<tr>
<td>MATH/STAT 525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP SCI/I SY E/</td>
<td>Nonlinear Optimization I</td>
<td>3</td>
</tr>
<tr>
<td>MATH/STAT 726</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PEOPLE**

**Faculty:** Professors J. Zhu (chair), Ane, Chappell, Chien, Keles, Larget, W-Y Loh, Newton, Shao, Y. Wang, Yandell, C. Zhang, Z. Zhang; Associate Professors P-L Loh, Raskutti, Rohe; Assistant Professors Garcia Trillos, Kang, Patel, Raschka, M. Wang, A. Zhang