INTERDISCIPLINARY DOCTOR OF PHILOSOPHY IN STATISTICS

Interdisciplinary Doctoral Program in Statistics (http://catalog.mit.edu/interdisciplinary/graduate-programs/phd-statistics)

Common Core
All students in the Interdisciplinary Doctoral Program in Statistics are required to complete the common core for a total of 27 units.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>or 18.675</td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>IDS.190</td>
<td>Doctoral Seminar in Statistics and Data Science</td>
<td>3</td>
</tr>
<tr>
<td>18.655</td>
<td>Mathematical Statistics</td>
<td>12</td>
</tr>
<tr>
<td>or 18.6501</td>
<td>Fundamentals of Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Total Units: 27

1 Mathematics students must enroll in 18.655.

Program-specific Requirements
Each student must complete the requirements specified by their home department in the lists below by taking one subject from the Computation and Statistics category and one subject from the Data Analysis category.

Aeronautics and Astronautics

Computation and Statistics
Select one of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.438</td>
<td>Algorithms for Inference</td>
</tr>
<tr>
<td>6.867</td>
<td>Machine Learning</td>
</tr>
<tr>
<td>9.520[J]</td>
<td>Statistical Learning Theory and Applications</td>
</tr>
<tr>
<td>16.391[J]</td>
<td>Statistics for Engineers and Scientists</td>
</tr>
<tr>
<td>16.940</td>
<td>Numerical Methods for Stochastic Modeling and Inference</td>
</tr>
</tbody>
</table>

Data Analysis
Select one of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.393</td>
<td>Statistical Communication and Localization Theory</td>
</tr>
<tr>
<td>16.470</td>
<td>Statistical Methods in Experimental Design</td>
</tr>
<tr>
<td>IDS.131[J]</td>
<td>Statistics, Computation and Applications</td>
</tr>
</tbody>
</table>

Total Units: 24

Brain and Cognitive Sciences

Computation and Statistics
Select one of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.252[J]</td>
<td>Nonlinear Optimization</td>
</tr>
<tr>
<td>6.256[J]</td>
<td>Algebraic Techniques and Semidefinite Optimization</td>
</tr>
<tr>
<td>6.438</td>
<td>Algorithms for Inference</td>
</tr>
<tr>
<td>6.867</td>
<td>Machine Learning</td>
</tr>
<tr>
<td>9.520[J]</td>
<td>Statistical Learning Theory and Applications</td>
</tr>
<tr>
<td>18.337[J]</td>
<td>Numerical Computing and Interactive Software</td>
</tr>
<tr>
<td>18.338</td>
<td>Eigenvalues of Random Matrices</td>
</tr>
<tr>
<td>18.415[J]</td>
<td>Advanced Algorithms</td>
</tr>
</tbody>
</table>

Economics

Computation and Statistics
Select one of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.520[J]</td>
<td>Statistical Learning Theory and Applications</td>
</tr>
<tr>
<td>6.867</td>
<td>Machine Learning</td>
</tr>
</tbody>
</table>

Data Analysis
Select one of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.192</td>
<td>Advanced Research and Communication</td>
</tr>
<tr>
<td>14.386</td>
<td>New Econometric Methods</td>
</tr>
<tr>
<td>or 14.387</td>
<td>Applied Econometrics</td>
</tr>
</tbody>
</table>

Total Units: 36

1 Students may substitute a more advanced subject with permission of the program director.

Mathematics

Computation and Statistics
Select one of the following: 12

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.252[J]</td>
<td>Nonlinear Optimization</td>
</tr>
<tr>
<td>6.256[J]</td>
<td>Algebraic Techniques and Semidefinite Optimization</td>
</tr>
<tr>
<td>6.438</td>
<td>Algorithms for Inference</td>
</tr>
<tr>
<td>6.867</td>
<td>Machine Learning</td>
</tr>
<tr>
<td>9.520[J]</td>
<td>Statistical Learning Theory and Applications</td>
</tr>
<tr>
<td>18.337[J]</td>
<td>Numerical Computing and Interactive Software</td>
</tr>
<tr>
<td>18.338</td>
<td>Eigenvalues of Random Matrices</td>
</tr>
<tr>
<td>18.415[J]</td>
<td>Advanced Algorithms</td>
</tr>
</tbody>
</table>
**INTERDISCIPLINARY DOCTOR OF PHILOSOPHY IN STATISTICS**

**Data Analysis**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.416[J]</td>
<td>Randomized Algorithms</td>
<td></td>
</tr>
<tr>
<td>18.657</td>
<td>Topics in Statistics</td>
<td></td>
</tr>
</tbody>
</table>

**Select one of the following:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.555[J]</td>
<td>Biomedical Signal and Image Processing</td>
<td>12</td>
</tr>
<tr>
<td>6.869</td>
<td>Advances in Computer Vision</td>
<td></td>
</tr>
<tr>
<td>9.272[J]</td>
<td>Topics in Neural Signal Processing</td>
<td></td>
</tr>
<tr>
<td>18.367</td>
<td>Waves and Imaging</td>
<td></td>
</tr>
<tr>
<td>IDS.131[J]</td>
<td>Statistics, Computation and Applications</td>
<td></td>
</tr>
</tbody>
</table>

**Total Units**

24

**Political Science**

**Computation and Statistics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.867</td>
<td>Machine Learning</td>
<td></td>
</tr>
<tr>
<td>9.520[J]</td>
<td>Statistical Learning Theory and Applications</td>
<td></td>
</tr>
<tr>
<td>14.381</td>
<td>Applied Econometrics</td>
<td></td>
</tr>
</tbody>
</table>

**Select one of the following:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.802</td>
<td>Quantitative Research Methods II: Causal Inference</td>
<td></td>
</tr>
<tr>
<td>17.804</td>
<td>Quantitative Research Methods III: Generalized Linear Models and Extensions</td>
<td></td>
</tr>
<tr>
<td>17.806</td>
<td>Quantitative Research Methods IV: Advanced Topics</td>
<td></td>
</tr>
</tbody>
</table>

**Data Analysis**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.555[J]</td>
<td>Biomedical Signal and Image Processing</td>
<td></td>
</tr>
<tr>
<td>6.869</td>
<td>Advances in Computer Vision</td>
<td></td>
</tr>
<tr>
<td>9.272[J]</td>
<td>Topics in Neural Signal Processing</td>
<td></td>
</tr>
<tr>
<td>14.386</td>
<td>New Econometric Methods</td>
<td></td>
</tr>
<tr>
<td>&amp; 14.192</td>
<td>and Advanced Research and Communication</td>
<td></td>
</tr>
<tr>
<td>14.387</td>
<td>Applied Econometrics</td>
<td></td>
</tr>
<tr>
<td>&amp; 14.192</td>
<td>and Advanced Research and Communication</td>
<td></td>
</tr>
<tr>
<td>18.367</td>
<td>Waves and Imaging</td>
<td></td>
</tr>
<tr>
<td>IDS.131[J]</td>
<td>Statistics, Computation and Applications</td>
<td></td>
</tr>
</tbody>
</table>

**Total Units**

24-27

**Social and Engineering Systems**

**Computation and Statistics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.434[J]</td>
<td>Statistics for Engineers and Scientists</td>
<td></td>
</tr>
<tr>
<td>6.438</td>
<td>Algorithms for Inference</td>
<td></td>
</tr>
<tr>
<td>6.867</td>
<td>Machine Learning</td>
<td></td>
</tr>
<tr>
<td>9.520[J]</td>
<td>Statistical Learning Theory and Applications</td>
<td></td>
</tr>
<tr>
<td>14.381</td>
<td>Applied Econometrics</td>
<td></td>
</tr>
<tr>
<td>14.382</td>
<td>Econometrics</td>
<td></td>
</tr>
<tr>
<td>15.077[J]</td>
<td>Statistical Learning and Data Mining</td>
<td></td>
</tr>
<tr>
<td>17.802</td>
<td>Quantitative Research Methods II: Causal Inference</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.804</td>
<td>Quantitative Research Methods III: Generalized Linear Models and Extensions</td>
<td></td>
</tr>
<tr>
<td>17.806</td>
<td>Quantitative Research Methods IV: Advanced Topics</td>
<td></td>
</tr>
</tbody>
</table>

**Total Units**

24