



UMSL is a NSA/DHS National Center of Academic Excellence in Cyber Defense Education



College of Arts and Sciences

Department of Mathematics and Computer Science

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## Undergraduate Certificate in Data Science – Computational Track

The certificate program provides basic training on skills required for working in growing and popular fields involving data and data analysis. It provides both statistical and computational background while also allowing to focus on specific technologies. A student pursuing this certificate can choose from one of the two tracks, the computational track and the statistical track. A minimum GPA of 2.5 is required for admission.

A minimum of four courses must be taken in residence in the [Department of Mathematics and Computer Science at UMSL](#). Courses may be substituted with the permission of the program director.

In addition to university scholarships, the department awards about \$40k annually in mostly [merit-based scholarships](#).

<b>Required core courses</b>	<b>Computational track</b>	<b>3</b>
<a href="#">CMP SCI 4340/5340</a>	Introduction to Machine Learning	
<a href="#">CMP SCI 4342/5342</a>	Introduction to Data Mining	
<i>Either</i> <a href="#">MATH 4005</a>	Exploratory Data Analysis with R	
<i>Or</i> <a href="#">MATH 4200</a>	Mathematical Statistics I	
<b>Choose three of the electives</b>		<b>3</b>
<a href="#">CMP SCI 4030/5030</a>	Introduction to Intelligent Web	
<a href="#">CMP SCI 4300/5300</a>	Introduction to Artificial Intelligence	
<a href="#">CMP SCI 4320/5320</a>	Introduction to Evolutionary Computation	
<a href="#">CMP SCI 4370/5370</a>	Introduction to Biological Data Science	
<a href="#">CMP SCI 4390/5390</a>	Introduction to Deep Learning	
<a href="#">MATH 4005</a>	Exploratory Data Analysis with R	
<a href="#">MATH 4090</a>	Introduction to High-dimensional Data Analysis	
<a href="#">MATH 4200</a>	Mathematical Statistics I	
<a href="#">MATH 4210</a>	Mathematical Statistics II	
<a href="#">MATH 4220</a>	Bayesian Statistical Methods	
<a href="#">MATH 4225</a>	Introduction to Statistical Computing	
<a href="#">MATH 4250</a>	Introduction to Stat Methods in Learning and Modeling	
<a href="#">MATH 4260</a>	Introduction to Stochastic Processes	
<b>Total courses (credit hours)</b>		<b>6(18)</b>

For more information visit [umsl.edu/cs](http://umsl.edu/cs).

For career information visit [umsl.edu/cs/careers](http://umsl.edu/cs/careers).

For electronic version of this document and more info visit <http://www.umsl.edu/cs/certificates>

**UMSL|NOW** : All courses available in the evening - some every semester some on rotation.