Certificate in Data Science

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. Each track consists of three required courses (9 credit hours) plus three additional elective courses (9 credit hours).

Required Courses:

CMP SCI 4340	Introduction to Machine Learning	3
CMP SCI 4342	Introduction to Data Mining	3
MATH 4200	Mathematical Statistics I	3
MATH 4210	Mathematical Statistics II	3
Choose two courses from the following:		6
CMP SCI 4030	Introduction to Intelligent Web	
CMP SCI 4300	Introduction to Artificial Intelligence	
CMP SCI 4610	Database Management Systems	
MATH 4220	Bayesian Statistical Methods	
Total Hours		18

Required Courses for the Computational Track:

CMP SCI 4340	Introduction to Machine Learning	3
CMP SCI 4342	Introduction to Data Mining	3
Choose one from the following:		3
MATH 4005	Exploratory Data Analysis with R	

MATH 4200	Mathematical Statistics I	

Required Courses for the Statistical Track:

MATH 4200	Mathematical Statistics I	3
MATH 4210	Mathematical Statistics II	3
Choose one from the following:		3
MATH 4250	Introduction to Statistical Methods in Learning and Modeling	
CMP SCI 4340	Introduction to Machine Learning	

Electives for both tracks:

Select additional three courses from the following:		9
CMP SCI 4030	Introduction to Intelligent Web	
CMP SCI 4300	Introduction to Artificial Intelligence	
CMP SCI 4320	Introduction to Evolutionary Computation	
CMP SCI 4340	Introduction to Machine Learning	
CMP SCI 4342	Introduction to Data Mining	
CMP SCI 4370	Introduction to Biological Data Science	
CMP SCI 4390	Introduction to Deep Learning	
MATH 4005	Exploratory Data Analysis with R	
MATH 4090	Introduction to High-dimensional Data Analysis	
MATH 4200	Mathematical Statistics I	
MATH 4210	Mathematical Statistics II	
MATH 4220	Bayesian Statistical Methods	

MATH 4225	Introduction to Statistical Computing	
MATH 4250	Introduction to Statistical Methods in Learning and Modeling	
MATH 4260	Introduction to Stochastic Processes	

Residency requirement: of the required six courses at least five must be taken at the University of Missouri – St. Louis. Elective courses may be substituted with the permission of the program director. For more information, contact the department chair or email info@arch.umsl.edu.

Sign-offs from other departments affected by this proposal

None

Rationale	Reflecting the interdisciplinary nature of the program, the changes will allow more students with either math or CS backgrounds to complete the certificate without being hindered by excessive prerequisites. Reflecting the interdisciplinary nature of the program, the changes will allow more students with either math or CS backgrounds to complete the certificate without being hindered by excessive prerequisites.