PREDICTIVE ANALYTICS AND RISK MANAGEMENT: FINANCIAL AND INSURANCE ANALYTICS, MS

for the Master of Science in Predictive Analytics and Risk Management, Financial and Insurance Analytics concentration

Prepares students for the nascent profession of predictive analytics; it provides background and skill sets for data analytics with focus on financial and insurance industries. A student successfully finishing the program will typically have acquired a broad foundation of machine learning and predictive modeling techniques to forecast outcomes and glean valuable insights that can lead to better-informed business and investment decisions.

The assessment of the above-stated learning objectives will include:

- the job placement/graduate school acceptance rates
- feedback from employers
- graduate satisfaction surveys

These assessments will be conducted on an annual basis. We conduct exit surveys on all students each year, which should provide data on graduate students' job placement and graduate school acceptance rates. On the survey we will design questions to assess student's overall evaluation of these learning objectives. The curriculum was developed in close collaboration with industry partners. We expect to maintain close relationship with them and seek their feedback on the quality of our graduates on a regular basis.

Graduate Degree Programs in Mathematics

- Actuarial Science, MS (http://catalog.illinois.edu/graduate/las/actuarial-science-ms/)
- Applied Mathematics, MS (http://catalog.illinois.edu/graduate/las/applied-mathematics-ms/)
- Mathematics, MS (http://catalog.illinois.edu/graduate/las/mathematics-ms/)
- Predictive Analytics and Risk Management, MS (http://catalog.illinois.edu/graduate/las/predictive-analytics-risk-management-ms/)
  - Enterprise Risk Management (http://catalog.illinois.edu/graduate/las/predictive-analytics-risk-management-ms/enterprise-risk-management/) | Financial and Insurance Analytics
- Mathematics, PhD (http://catalog.illinois.edu/graduate/las/mathematics-phd/)
  - optional concentrations: (http://catalog.illinois.edu/graduate/las/mathematics-phd/)
    - Actuarial Science & Risk Analytics (http://catalog.illinois.edu/graduate/las/mathematics-phd/actuarial-science-risk-analytics/)
- Computational Science and Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/)
- Teaching of Mathematics, MS (http://catalog.illinois.edu/graduate/las/teaching-mathematics-ms/)

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Courses will be scheduled so that students may complete the 32-hour program in one academic year. Each concentration requires 12 hours of common core courses, organized around three broad areas of expertise, including a case study course. Each concentration also requires 12 hours of related area coursework specific to the concentration, plus an additional 8 hours of electives from a prescribed list included in this proposal. At least 12 hours must be taken at the 500 level.

Code	Title	Hours
Core Requirements (12 hours):		
FIN 530	Foundations in Risk Management	2
ASRM 410	Investments and Financial Markets	4
ASRM 539	Risk Analytics and Decision Making	2
ASRM 555	Advanced Predictive Analytics	4
Concentration Required Courses (see below)		**12**
Electives (see below)		**8**
Total Hours		**32**

Other Requirements

Code	Title	Hours
Other requirements may overlap		
A concentration is required.		
Minimum 500-level Hours Required Overall:		12
Minimum GPA:		2.75

Financial and Insurance Analytics Concentration

Code	Title	Hours
Required Courses:		**12**
STAT 431	Applied Bayesian Analysis	
STAT 432	Basics of Statistical Learning	
STAT 480	Big Data Analytics	
Electives:		**8**
Choose two of the following:		
ASRM 409	Stochastic Processes for Finance and Insurance	
ASRM 499	Topics in Actuarial Science	
ASRM 510	Financial Mathematics	
ASRM 533	Risk Management Practices and Regulation	
ASRM 539	Risk Analytics and Decision Making (if not taken as a core requirement)	
ASRM 561	Loss Data Analytics & Credibility	
ASRM 569	Extreme Value Theory and Catastrophe Modeling	
ASRM 575	Life Insurance and Pension Mathematics	

ASRM 595	Advanced Topics in Actuarial Science and Risk Analytics	
FIN 431	Property-Liability Insurance	
FIN 511	Investments	
FIN 512	Financial Derivatives	
FIN 513	Applications of Financial Engineering	
FIN 514	Valuation of Complex Derivative Securities	
FIN 515	Fixed Income Portfolios	
FIN 519	Behavioral Finance	
FIN 526	Investment Banking	
FIN 537	Financial Risk Management	
FIN 551	International Finance	
FIN 580	Special Topics in Finance (Big Data Analytics)	
FIN 590	Individual Study and Research	
MATH 563		
STAT 542	Statistical Learning	
STAT 590	Individual Study and Research	

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Unit website
Program website
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College of Liberal Arts & Sciences

College of Liberal Arts & Sciences website (https://las.illinois.edu/)

Admissions

Graduate College Admissions & Requirements (https://grad.illinois.edu/admissions/apply/)
Overview of Program Admissions & Requirements (https://predictive-analytics.illinois.edu/admission-requirement/)