

Graduate Certificates in Intercollegiate Programs

Certificates in Data Science & Financial Analytics, Quantitative Risk Management or Financial Operations Research are available to Lehigh graduate students, provided prerequisites are met. Students may meet with any Program Director listed below to select their certificate choice upon enrollment in a graduate degree program.

Certificate programs enhance skills and development by allowing additional exploration in three main functional areas.

1. Data Science & Financial Analytics (DSFA) Certificate

Students develop a unique skill set preparing them for careers in the interdisciplinary field of Data Science and Financial Analytics, with particular application to the financial services industry. Skills developed include working with massive data sets, data-driven analytical methodologies, SAS and R programming, Data Mining, and Machine Learning.

Curriculum: (12 credits)

ISE 465 Applied Data Mining (3)

STAT 412 Statistical Computing and Applications (3)

One of the two courses below:

ISE 469 Mining of Large-scale Datasets (3)

ISE 444 Optimization Methods in Machine Learning (3)

One of the two data-intensive finance courses below:

GBUS 422 Derivatives and Risk Management (3)

GBUS 424 Advanced Topics in Financial Management-Risk Management (3)

2. Quantitative Risk Management (QRM) Certificate

Students are trained in the quantitative methodologies and regulatory practices that are essential for risk management functions within financial institutions.

Curriculum (12 credits)

GBUS 422 Derivatives and Risk Management (3)

GBUS 424 Advanced Topics in Financial Management-Risk Management (3)

GBUS 426 Financial Markets and Institutions (3)

One of the following courses:

STAT 434/MATH 334 Mathematical Statistics (3,4)

MATH 461 (STAT 461) Topics in Mathematical Statistics (3)

STAT 438/MATH 338 Linear Model in Statistics with Applications (3,4)

3. Financial Operations Research

Students gain an understanding of the fundamental techniques underlying Operations Research that are of ubiquitous use in all areas of business today, such as Linear Programming, Game Theory, Dynamic Programming, Integer Programming, Nonlinear Programming, and Machine Learning.

Curriculum (12 credits)

ISE 426 Optimization Models and Applications (3)

ISE 447 Financial Optimization (3)

Select 2 courses from the following:

ISE 458 (ECO 463) Game Theory (3)

ISE 455 Optimization Algorithms and Software (3)

ISE 407 Computational Methods in Optimization (3)

ISE 416 Dynamic Programming (3)

ISE 444 Optimization Methods in Machine Learning (3)

ISE 467 Mining or Large-scale Datasets (3)

Information may be obtained from any co-director below:

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