Proposal for a Graduate Certificate in Financial Statistics and Risk Management (restricted to MSMF and MSDS students)

Programs of Computer Science, Mathematics and Statistics

Summary

The Master’s Program in Financial Statistics and Risk Management (FSRM), operated by the Program of Statistics, proposes to establish an internal Certificate in FSRM, offered exclusively to students in the Master’s Program in Mathematical Finance (MSMF) and Master’s Program in Data Science (MSDS), both CS track and Stat track. A certificate would be earned by a student who has completed five courses (fifteen credits) from a menu of courses, with three of those courses taken in addition to ten courses required for MSMF degree, MSDS (Stat) degree and twelve courses required for MSDS (CS) degree. The proposed certificate program will be jointly managed by a committee of three faculty members, one each from the Programs of Computer Sciences, Mathematics and Statistics.

Goals for the Certificate in Financial Statistics and Risk Management

The knowledge of statistical finance and risk management is useful for a professional working in mathematical finance and data science in the financial industry. There is strong industry demand for graduates with expertise in both areas. In response to this demand, we seek to provide MSMF and MSDS students with a certificate that can be tailored to their specific needs and will enhance their career opportunities. The certificate program is designed to complement and enhance the existing M.S. in Mathematical Finance degree and M.S in Data Science degree, and will only be open to students admitted to and enrolled in these degree programs. The existing MSMF and MSDS degree programs comprises ten to twelve three-credit courses and it is very difficult to provide MSMF and MSDS master’s degree students with the additional skills they need in financial statistics and risk management within the degree program alone. The proposed certificate program addresses that difficulty.

Existing Degree and Certificate Programs at Rutgers

There are other certificate and degree programs offered by other units at Rutgers and all those we are aware of are listed below. The rationale for offering an internal FSRM certificate to MSMF and MSDS students is as follows:

a) The certificate is internal and intended to enhance the credentials of MSMF students in a way that would not be possible within the 30-credit master’s degree program;

b) The certificate is neither designed for students whose major is FSRM nor is it our intention draw students from existing FSRM, MSMF or MQF programs at Rutgers;

c) The control over the structure of the certificate program by a joint committee – whose members will comprise a representative from the Program of Statistics, the Program of Mathematics, and the Program of Computer Science – will ensure that the certificate program is tightly integrated with the existing
April 19, 2018

MSMF and MSDS master’s degree programs, addresses the needs of MSMF and MSDS students, and ensures the quality of content and the provision of relevant courses.

Related degree programs at Rutgers include:

Master’s Degree in Financial Statistics and Risk Management

Master’s Degree in Mathematical Finance

Master’s Degree in Quantitative Finance

Quality of the Program and its Offerings

The Program of Statistics has run the FSRM program successfully for many years. The courses are well designed and the faculty in the program are experts in the area. The Program of Mathematics have successfully run the MSMF program for many years. The Program of Computer Science and Program of Statistics have successfully started the MSDS program, after close collaboration and careful consideration on the design of curriculum. The collaboration will ensure the success of the proposed certificate program.

Menu of three-Credit Courses and Certificate Requirements

Any of the five required courses in FSRM program, or equivalent courses (approved by the managing committee). Three of the five are in addition to the ten three-credit courses required by the MSMF and MSDS (Stat) degree program or the twelve three-credit courses required by the MSDS (CS) degree program.

The pre-requisites and syllabi of all courses are determined by the programs offering those courses.

Sample Pathways

Sample path way for MSMF and MSDS students with additional certification courses are included in the appendix. For completion, sample pathway for MS degree only in the programs are also included.

Additional Credit Burden on Students and Impact on Time to Degree Completion

Most students who are pursuing a standard ten-course (30-credit) master’s degree program should be able to complete their degree and certificate within two academic years by

1. Following a 4-3-3-3 or 4-4-3-2 regular semester-course schedule (with no summer courses), or
2. Following a 4-3-2-2 regular semester-course schedule with one mid-program summer semester course.
Master's degree students who are pursuing a twelve-course (36-credit) master's degree program should be able to complete their degree and certificate within two academic years by pursuing a more intensive program over four regular semesters (for example, 4-4-4-3), four regular semesters plus one mid-program summer semester with 1 or 2 courses, or five regular semesters (for example, 4-3-3-3-2).

Students will delay graduation until they have completed both their master's degree program and certificate requirements.

If the proposed certificate structure (two courses double counted with three courses in addition to the students' master's degree requirements) proves too burdensome in practice for most students (after one trial year), we will modify the structure so that three courses may be double counted with two courses in addition to their master's degree requirements.

Admission and Certificate Requirements

The MSMF degree program admits approximately 50 students each Fall. The MSDS degree program admits approximately total 70 students under two tracks each Fall. Students enrolled in the degree programs who have completed their first year with a GPA of 3.0 or higher and have taken the prerequisite courses will be eligible to earn the Certificate in Financial Statistics and Risk Management. Most students can complete their degree program requirements within three semesters and students who wish to earn the certificate can complete the additional requirements by the end of their fourth semester. Students would be required to complete the five courses designated for the certificate with grade B or higher.

Resources:

MSMF and MSDS students who have been approved for the certificate program will have the second highest priority in securing seats in the courses offered by FSRM program, with the highest priority given to students enrolled in the FSRM program.
### MSDS (stat) and MSMF with FSRM certificate sample pathway

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<thead>
<tr>
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<th>FSRM certificate</th>
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<th>FSRM certificate</th>
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### MS Degree only Sample pathway

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