The Statistics Track

(AMS website: http://www.ams.sunysb.edu/)

1. **Our faculty** (in alphabetical order):

   **Core faculty**
   - Professor Hongshik Ahn ([Hongshik.Ahn@stonybrook.edu](mailto:Hongshik.Ahn@stonybrook.edu)), math tower 1-112
   - Professor Stephen Finch ([Stephen.Finch@stonybrook.edu](mailto:Stephen.Finch@stonybrook.edu)), math tower 1-113
   - Professor Pei-fen Kuan ([Peifen.Kuan@stonybrook.edu](mailto:Peifen.Kuan@stonybrook.edu)), math tower 1-106
   - Professor Haipeng Xing ([Haipeng.Xing@stonybrook.edu](mailto:Haipeng.Xing@stonybrook.edu)), math tower 1-102
   - Professor Song Wu ([Song.Wu@stonybrook.edu](mailto:Song.Wu@stonybrook.edu)), math tower 1-114
   - Professor Wei Zhu ([Wei.Zhu@stonybrook.edu](mailto:Wei.Zhu@stonybrook.edu)), math tower P-138

   **Affiliated faculty from the Department of Preventive Medicine**
   - Professor Wei Hou ([Wei.Hou.1@stonybrook.edu](mailto:Wei.Hou.1@stonybrook.edu))
   - Professor Barbara Nemesure ([Barbara.Nemesure@stonybrook.edu](mailto:Barbara.Nemesure@stonybrook.edu))
   - Professor Jie Yang ([Jie.Yang@stonybrook.edu](mailto:Jie.Yang@stonybrook.edu))

   **Other adjunct faculty:**
   http://www.stonybrook.edu/commcms/ams/people/affiliatedfaculty.php

2. **Master course requirement** (10 courses <30-credit>, no thesis):

   Required Courses for M.S. Degree in Statistics Track
   - **AMS 507 Introduction to Probability** (Fall)
   - **AMS 510 Analytical Methods for Applied Mathematics and Statistics** (Fall)
   - **AMS 570 Mathematical Statistics I** (Spring)
   - **AMS 571 Mathematical Statistics II** (required for PhD only) (Fall)
   - **AMS 572 Data Analysis** (Fall)
   - **AMS 573 Design and Analysis of Categorical Data** (Spring)
   - **AMS 578 Regression** (Spring)
   - **AMS 582 Design of Experiments** (Fall)
   - **AMS 597 Statistical Computing** (Spring)

   Plus two electives chosen from other graduate courses in the department or (with approval) graduate statistics courses in other departments. Some popular choices:

   - **AMS 595 Fundamentals of Computing** (Fall)
   - **AMS 511 Foundation of Quantitative Finance** (Fall)
   - **AMS 516 Statistical Methods in Finance** (Fall)
   - **AMS 530 Principles in Parallel Computing** (Fall)
   - **AMS 562 Introduction to Scientific Programming in C++** (Fall)
   - **AMS 598 Big Data Analysis** (Fall)
   - **AMS 588 Failure and Survival Data Analysis** (Fall)
AMS 577 Multivariate Data Analysis (including data mining procedures) (Fall)
AMS 586 Time Series Analysis (Spring)
AMS 550 Stochastic Models (Spring)

*You will notice we have more electives in Fall than Spring because most of you will graduate in 3 semesters (Fall, Spring, Fall). Once you have taken all core courses and fulfilled the 30-credit required for the MS degree, one must graduate.

The first year graduate students (G1/G3) should take 4 courses (12-credit) per semester. The second year graduate student (G2/G4) should take 3 courses (9-credit) per semester.

3. Recommended course schedule

For our master students in statistics, we recommend the following schedule (*our doctoral students can follow the same schedule for the first 3 semesters):

(1) Year 1, Fall semester: AMS 507, AMS 510, AMS 572, AMS 595 (*those who could not register for 595 this semester, can register for 562 instead – and take 595 next fall.)

AMS 507 Introduction to Probability
Note: Crosslisted with HPH 696
96479 LEC 01 MW 5:30-6:50PM Loc: Javits Lctr. 101 Inst: Jiaqiao Hu
96478 REC R01 RECM 7:00-7:53PM Loc: Javits Lctr. 109 Inst: Fang Qi / Avinash Barnwal

AMS 510 Analytical Methods for Applied Mathematics
96480 LEC 01 TUTH 1:00-2:20PM Loc: Humanities 1003 Inst: David Green
96481 REC R01 RECW 7:00-7:53PM Loc: Javits Lctr. 109 Inst: Xin Cao / Chenxiao Xu

AMS 572 Data Analysis I
92119 LEC 02 TUTH 11:30AM-12:50PM Loc: Javits Lctr. 101 Inst: Pei Fen Kuan

AMS 562 Introduction to Scientific Programming in C++
92098 LEC 01 MWF 10:00-10:53AM Loc: SBS N118 Inst: Qiao Chen

AMS 595.01 Fundamentals of Computing
96162 LEC 01 MW 10:00-11:20AM Loc: Frey Hall 305 Inst: Xiangmin Jiao, Barbara Chapman

AMS 595.03 Fundamentals of Computing
97259 LEC 03 Tu/Th 7:00-8:20PM Loc: Frey Hall 205 Inst: Nicolas Bosviel, Yongming Shen

** Those who consider themselves to have already a solid background in statistics (for example, some of our doctoral students), can consider taking AMS 571 Mathematical Statistics (Prof. Zhu for Fall 2017) and/or AMS 582 Design of Experiments (Prof Finch for
Fall 2017. Note: same time period as AMS 510). Please be sure to consult the instructor for the course you wish to take first, sending them your CV/transcripts, so that they can decide whether you are ready.

**AMS 571 Mathematical Statistics**  
Prerequisite: AMS 570 is preferred but not required  
91163 LEC 01 TUTH 10:00-11:20AM Loc: Humanities 3015 Inst: Wei Zhu

**AMS 582 Design of Experiments**  
Prerequisite: AMS 572 or equivalent  
89964 LEC 01 TUTH 1:00-2:20PM Loc: Harriman Hall 112 Inst: Stephen Finch

** Those of our master and doctoral students who are interested in our sister-track of Quantitative Finance (QF), can also consider taking **AMS 511** Foundation of Quantitative Finance.

**AMS 511 Quantitative Risk Management**  
Prerequisites: AMS 505 or AMS 510  
911996 LEC 01 W 2:30-5:20PM Loc: Frey Hall 313 Inst: Robert Frey

* All graduate students are expected to maintain a B or better grade average. Otherwise one can not graduate *

(2) **Year 1, Spring semester:** AMS 570, AMS 573, AMS 578, AMS 597.

(3) **Year 2, Fall semester:** AMS 582, AMS 588, AMS 598, AMS 595 (*for those who did not take it in the first fall), AMS 516, AMS 577 (**Note you can graduate with your MS degree at the end of this semester for you have already taken at least 10 courses including all the core courses)

(4) **Year 2, Spring semester:** AMS 550, AMS 586 – plus another course in your area of interest. For example, if you are interested in QF, you may consider AMS 512 (Capital Markets and Portfolio Theory). If you are interested in big data /data science, you may consider AMS 530 (Principles in Parallel Computing).

** Given that the track of Statistics is highly correlated with the track of Quantitative Finance, interested students can choose to take selected courses in QF and obtain the Advanced Graduate Certificate in Quantitative Finance as introduced below.

4. **Advanced Graduate Certificate in Quantitative Finance (QF):**

Any strong student (3.5+ GPA in first-semester core courses) in another track (such as statistics) may enroll in AMS 511, Foundations in Quantitative Finance. With the permission of the Quantitative Finance Program Director (Prof. Raphael Douady), one
may take additional quantitative finance courses to earn an Advanced Graduate Certificate in Quantitative Finance. You must formally apply for the secondary certificate program prior to taking the required courses. Only a maximum of six credits taken prior to enrolling in the certificate program may be used towards the requirements. The 15-credit advanced certificate requires AMS 511, 512, 513, one additional QF elective, and one additional AMS course.

AMS 511 Foundations of Quantitative Finance  
AMS 512 Portfolio Theory  
AMS 513 Financial Derivatives and Stochastic Calculus  

*** Enrolling in the certificate program will require the permission of Prof. Wei Zhu. Please contact her during your first semester, or at the beginning of your second semester.***

The form to apply for the secondary certificate program can also be accessed here: http://grad.stonybrook.edu/_data/documents/forms/newforms/Permission%20to%20Enroll%20in%20a%20Secondary%20Certificate%20Program.pdf

For our master students in statistics who wish to get the advanced graduate certificate in QF, we recommend the following schedule (*our doctoral students can follow the same schedule):

(1) Year 1, Fall semester: AMS 507, AMS 510, AMS 572, AMS 595

(2) Year 1, Spring semester: AMS 570, AMS 573, AMS 578, AMS 512

(3) Year 2, Fall semester: AMS 582, AMS 511, AMS 588, AMS 598 (*One must take 582 & 511 – however, to maintain full time status, 9 credits, you only need one more elective, so choose one from 588 and 598 and other graduate courses)

(4) Year 2, Spring semester: AMS 597, AMS 513, AMS 586, (AMS 550 etc. – optional)

5. Advanced Graduate Certificate in Operations Research (OR):

The department also has an 18-credit advanced graduate certificate in Operations Research (http://www.stonybrook.edu/commcms/spd/graduate/operations.php). This certificate has 5 REQUIRED COURSES (15 credits):

AMS 507 Introduction to Probability  
AMS 540 Linear Programming  
AMS 550 Stochastic Models  
AMS 553 Simulation and Modeling  
AMS 572 Data Analysis I
Plus one ELECTIVE (3 credits) which can be any graduate course in AMS, management and policy, or computer science, which has been approved by the student's advisor. For students in statistics, one only needs to be sure to take AMS 540, 550, and 553.

*** Please contact Prof. Wei Zhu during your first semester or at the beginning of your second semester if you are interested in the OR certificate.***

Once you have informed Prof. Wei Zhu, you can finish the enrolling process through the School of Professional Development (SPD):
http://www.stonybrook.edu/commcms/spd/graduate/operations.php

For our master students in statistics who wish to obtain the advanced graduate certificate in OR, we recommend the following schedule (*our doctoral students can follow the same schedule):

(1) Year 1, Fall semester: **AMS 507, AMS 510, AMS 572, AMS 595**

(2) Year 1, Spring semester: **AMS 570, AMS 573, AMS 578, AMS 550**

(3) Year 2, Fall semester: **AMS 582, AMS 540**, AMS 588, AMS 598 (*One must take 582 & 540 – however, to maintain full time status, 9 credits, you only need one more elective, so choose one from 588 and 598 and other graduate courses*)

(4) Year 2, Spring semester: **AMS 597, AMS 553**, AMS 586, (AMS 530 etc. – optional)

*** Please note that for an international (F-1) student, the QF or OR certificate program must be finished before or at the same time with your major degree program (e.g. your AMS Master degree). Therefore you must hold a core course back (*in the above two course schedules, I have chosen to hold back AMS 597*) otherwise once you finish all the courses required for your major degree program, one must graduate – even if your certificate program is not finished.***

6. Other course related issues

- PhD supported as TA needs to take an English language course, please see the following site for detailed information: (This course does count towards yours credits – so if you need to take this course, you can only take another 3 courses.)
  https://linguistics.stonybrook.edu/esl/courses
- All PhD students need to take AMS 500 – you only need to take it once every 4 years while you are here. (*This course does not count towards your credits.*)
For both our PhD and our MS students, please take no more than 4 courses per semester.

7. Doctoral qualifying exam requirements:
Our doctoral students are expected to take and pass the following doctoral qualifying exams in 1-2 years. Each exam is offered twice per year in January and June.

(1) **Foundation Exam**: 3-hour close book exam covering AMS 507 and AMS 510.
(2) **STAT Area Exam**: This is a 4-hour in-class exam with two parts:
   (i) **Math STAT Exam**: 2-hour close book exam covering AMS 570 and AMS 571.
   (ii) **Applied STAT Exam**: 2-hour open book exam covering AMS 572, AMS 573, AMS 578, and AMS 582. One problem from each course will be given. One must choose to do exactly 3 out of these 4 problems given. Four books, 4 notes, & a calculator are allowed but no computers.

*** Students are expected to take and pass the Foundation Exam first before taking the STAT Area Exam. However, they are allowed to take both exams together. Also, our master students in good standing (grades of B+ or better in all related courses) can take these doctoral qualifying exams.

We urge those of you who wish to take the qualifying exams to study for the exams early. Please check out the outlines of these exams in the following website – and please note that at the end of the page, you have a link to past qualifying exam questions. Prepare early for success.

[http://www.stonybrook.edu/commcms/ams/graduate/resources/quals-website.php](http://www.stonybrook.edu/commcms/ams/graduate/resources/quals-website.php)

8. Data Science:

Data science has been gaining increasing job market in the recent years – especially with the advent of advanced computers and the internet. “Data Scientist” has been voted the most satisfying job, two years (2016, 2017) in a row, by glassdoor.com. Computer programming and data analysis are the two main pillars of data science. Aside from our rigorous data analysis training, we have also strengthened your programming training with many programming and algorithm classes. The following courses are the subset that we hope you can all master:

AMS 595 Fundamentals of Computing (matlab, Python, C++) – everyone should take this if one is not a master of the materials yet
AMS 597 Statistical Computing (R, and a bit Perl) – this is also a core course in statistics

AMS 598 Big Data Analysis -- application of the supercomputing for statistical data analyses, particularly on big data

AMS 530 Principles in Parallel Computing – this course is also closely related to big data analysis. We hope those of you who missed 598 will take 530.

9. **Be safe on campus and off campus:**

We are a beautiful campus located in a very safe town. However one must always be cautious and do not put oneself in any potentially dangerous position. For example, do not get into any stranger’s car; and always wait for the pedestrian walking sign before you cross the street – and look around before stepping into the cross section. When taking the train or subway, stay away from the edge of the platform. It is also very important that you do not drive without a proper driver’s license. ... Our safety advice goes on and on, following the same lines as those from your parents.

**Be safe & diligent, we wish you all the successes!**