

Ma 488 ~ Applications of Probability

Spring Semester 2021-2022

Instructor:	Dr. Melissa Gardenghi
Office:	Alumni 38
Office Hours:	Daily by appointment (see below to schedule)
Preferred Method of Communication:	MS Teams; personal correspondence by personal chat and general course/content related questions in the course general channel
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Course Website:	https://math.bju.edu/ma488/

Course Description:

A study of the applications of calculus and probability consistent with the SOA/CAS Exam P/1 syllabus.

Prerequisite: Ma 404 – Probability and Statistics I

Course Context: This course supports the following goals of the actuarial program:

- ASM2: The student will progress logically from premises to valid conclusions in a variety of mathematical and applied contexts including analysis, statistics (both theoretical and applied), probability, and finance.
- AMS3: The student will apply mathematics to actuarial problems (such as financial math and probability modeling) in exercising the biblical mandate to have dominion over the earth.

Course Goals:

- CG1: Introduce the student to the content and style of questions presented on the Probability Exam (Exam P/1). ASM2 and ASM3
- CG2: Prepare the student, including speed and accuracy, to pass the Probability Exam (Exam P/1). ASM2 and ASM3

Course Objectives: The student will be able to

1. Compile necessary study notes to be able to thoroughly prepare for a SOA exam. CG2
2. Determine the appropriate approach for solving problems similar to those given on the Probability Exam (Exam P/1). CG1
3. Complete a practice exam during a three hour period with an acceptable percentage of correct answers. CG2

Course Requirements and Evaluation:

1. The grade in this course will be based on the following (and can be estimated using the Study Log Excel file):
 - a. completion of a study plan/budget – 5% (due on the start of the second class)
 - i. when will the study happen during the week
 - ii. when will you learn new material, when will you review
 - iii. when in the semester will you start taking practice exams
 - iv. how do you plan to be efficient in your study – be specific (time limits, goals, start-up costs, self-imposed pressure, etc.)
 - v. your grade on this portion will be dependent on how well your plan will meet your study goals
 - b. completion of your concept map and study notes – 10%,
 - i. one-page map including all Exam LTAM content
 - ii. more detailed notes per large topic (preferably boiled down to the biggest ideas on one page)
 - c. quality time spent in preparation for the exam (computed as quality time = time in # of hrs * quality rating/4; where quality rating is given on a scale of 1 to 4) – 30%,
 - d. time spent reviewing previous material – 5%

- e. number and accuracy of practice problems completed – 25% and 15% respectively,
- f. scores on practice exams – 10%.
2. Passing the Probability Exam (Exam P/1) at any point during the semester will immediately result in an A in the course (no other work will be required).

Office Hour Appointments:

Office hour appointments can be made using the Calendly site.

Instructions for using the site: <https://math.bju.edu/media/bju-math-division/bju-math-department/melissa-gardenghi/Office-Hours-Procedure.pdf>

A direct link to Calendly for making appointments with Dr. Gardenghi: <https://calendly.com/mgardeng/20min>

General Policies:

1. You are expected to attend class on Thursdays (or the weekly meeting as scheduled) in accordance with University policy. See the student handbook for attendance requirements. Note that missing class does not allow you to not meet your weekly study requirements.
2. You will maintain the study log (see the provided Excel spreadsheet) to document your study efforts. You will post the Excel file (and keep it updated) in your personal Exam Prep MS Teams channel, so that I can keep tabs on your progress.
3. You may find it beneficial to study together. This can be very valuable for several reasons, and it is highly recommended.

General Guidelines for Actuarial Exams:

Excerpt from <http://www.soa.org/library/newsletters/the-future-actuary/2007/summer/how-to-prepare.aspx> (retrieved August 17, 2011)

“There is no substitute for starting early. No matter how well you have done in your math classes, it is best to start at least eight weeks prior to the P/1 exam. Keep in mind that everyone taking this exam has excelled in mathematics. The exams are very rigorous and are designed to test knowledge of the material at a very high level. That is why the pass rate on this exam typically ranges only in the 30 to 40 percent range.”

Note that in 2012 approximately 42 to 50%, in 2015 approximately 46 to 54%, and in 2019 approximately 43 to 53% of the students completing Exam P passed it.

See *Hints on Study and Exam Techniques* from the CAS (Casualty Actuarial Society) from <http://www.casact.org/admissions/syllabus/index.cfm?fa=hints> (retrieved January 2, 2013)

Textbook: There is no required text for this course. However, you may find it beneficial to acquire any of the texts recommended for the exam (or you may find your Prob/Stats or El Stats texts sufficient along with a study guide) or one of the study guides available.

Students in the past have found the Adapt exams at Coaching Actuaries a very helpful resource. (see <https://www.coachingactuaries.com>)

Tentative Schedule: Based on the SOA Exam P/1 Syllabus, subject to change

- Probability: 2 weeks
- Univariate Distributions: 2-3 weeks
- Multivariate Distributions: 4-5 weeks
- General Review: 2-3 weeks
- Practice Exams: 2 weeks