

SUBJECT DESCRIPTION FORM

Subject Title: Probability & Distributions

Subject Code: AMA2691

Co-requisite: Calculus (AMA140)

Exclusion: Probability & Distributions (AMA269)

Objectives:

To provide students with basic probability theory and enable them to apply it in investment science. In particular, the students are to become familiar with various families of probability distributions and their properties.

Learning Outcome:

Upon satisfactory completion of the subject, students should be able to:

1. understand the concepts of probability theory and random variables;
 2. construct probability models in situations with uncertainty;
 3. get familiar with various families of discrete and continuous distributions;
 4. calculate probabilities, moments and other related quantities based on given distributions;
 5. apply the acquired knowledge and techniques in probability and distribution theories to deal with problems in investment science.
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Learning Approach:

Lecture	28 hours
Tutorial	14 hours
Total	<u>42 hours</u>

The learning outcomes listed above will be achieved through a combination of lectures, tutorials, interactions between the lecturers and students, assignments, tests and the final examination.

Assessment:

Continuous Assessment	40%
Examination	60%
Total	<u>100%</u>

The learning outcomes will be assessed by a combination of assignments, mid-term tests and the final examination.

Learning outcomes 1- 4 are assessed by tests and examination. Learning outcomes 3, 5 and 6 are assessed by computer assignments with real data.

To pass this subject, students are required to obtain Grade D or above in both the Continuous Assessment and the Examination components.

Syllabus:

Probability

Sample space, events, probability, conditional probability, independence, Bayes theorem. (9 hours)

Random variables and distributions

Random variables, independence of random variables; probability distributions: probability, density and cumulative distribution functions, various families of discrete and continuous distributions; expectation and variance, moments and moment-generating function; joint, marginal and conditional distributions; transformation of random variables. (21 hours)

Sampling theory

Sampling distributions, normal, t , chi-square and F distributions. (12 hours)

Textbook:

Hogg, R.V. and
Tanis, E.A.

Probability and Statistical Inference,
5th edition

Prentice Hall, 1997

or

an equivalent (introductory) textbook on
mathematical statistics.