# Subject Description Form

| Subject Code | AMA2634 |
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| **Subject Title** | Introduction to Statistics |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite** | Basic Statistics I (AMA1006) or<br>Probability & Distributions (AMA2691) or equivalent |
| **Exclusion** | Statistics for Finance Analytics (AMA2601) |
| **Objectives** | This subject is to introduce students to the compilation of statistical data, common probability distributions and elements of statistical inference. |
| **Intended Learning Outcomes** | Upon satisfactory completion of the subject, students should be able to:<br>a. apply knowledge on descriptive statistics to organize and summarize financial data;<br>b. find confidence intervals for the sample mean, sample variance and sample proportion;<br>c. discuss the concepts of hypothesis testing, including the type I error, type II error, and one-sided and two sided tests;<br>d. apply the concepts of hypothesis testing to simple statistical problems;<br>e. use the Pearson's chi-square test for goodness of fit;<br>f. carry out nonparametric tests for simple statistical problems;<br>g. use statistical software, such as R, to visually present data and to perform simple statistical analyses for problems in finance. |
| **Subject Synopsis/ Indicative Syllabus** | *Descriptive and Visual Statistics*<br>Descriptive statistics: mean, mode, median, percentiles, variance, standard deviation, coefficient of variation. Frequency distributions, cumulative frequency distributions. Use statistical software to produce bar plots, boxplots, histograms, and ogives.<br><br>*Estimation of Parameters*<br>Point and interval estimators of mean, proportion, variance, and the difference between two means or two proportions. The normal distribution, t-distribution and various distributions. Sample size calculation for a pre-specified estimation accuracy. Applications to finance analytics.<br><br>*Test of Hypotheses*<br>Basic concepts in hypothesis testing: statistical hypotheses, type I and type II errors, one-sided and two-sided tests, significance levels, test statistics, and critical regions. Tests for population mean, population proportion, population variance, difference between two means, and difference between two proportions. The chi- |

square distribution and the Pearson's chi-square test for goodness of fit. Multiple-testing correlation: Bonferroni correction. Applications to finance analytics.

*Nonparametric Tests*
The sign test, the signed rank test, the rank sum test, and the Kolmogrov-Smirnov test.

| **Teaching/Learning Methodology** | The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to introduce the basic statistics concepts of the topics in the syllabus, which are then reinforced by learning activities including demonstration, tutorial exercise and assignments. |
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| **Assessment Methods in Alignment with Intended Learning Outcomes** | Specific assessment methods | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | a | b | c | d | e | f | g |
| | 1. Assignments/Quizzes | 15% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 2. Test | 25% | ✓ | ✓ | ✓ | ✓ | | | |
| | 3. Examination | 60% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Total | 100 % | | | | | | | |

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The subject focuses on knowledge, skill and understanding of **Introduction to Statistics**, thus, **Exam-based assessment** is the most appropriate assessment method, including 25% test and 60% examination. Moreover, 15% worth of assignments and quizzes are included as a component of continuous assessment so as to keep the students in progress.

Continuous Assessment comprises of assignments and/or quizzes, and tests. A written examination is held at the end of the semester.

| **Student Study Effort Expected** | Class contact: | |
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| | ▪ Lecture | 26 Hrs. |
| | ▪ Tutorial | 13 Hrs. |
| | Other student study effort: | |
| | ▪ Assignment/Quiz | 26 Hrs. |
| | ▪ Self-study | 40 Hrs. |
| | Total student study effort | 105 Hrs. |

| **Reading List and References** | <u>Textbook</u>: | | |
|---|---|---|---|
| | Johnson, R., Miller, I. and Freund, J.E. | Miller & Freund's Probability and Statistics for Engineers | Prentice-Hall 2010 |

| | | 8<sup>th</sup> edition | |
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References:

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| Wackerly, D.D., Mendenhall, W., & Scheaffer, R.L. | Mathematical Statistics with Applications $7^{th}$ edition | Duxbury Press 2007 | |
| Montgomery, D.C. and Runger, G.C. | Applied Statistics and Probability for Engineers $6^{th}$ edition | Wiley 2013 | |
| Keller, G. | Statistics for Management and Economics $10^{th}$ edition | Cengage Learning 2014 | |
| Anderson, D.R., Sweeney, D.J., Williams, T.A., Camm, J.D., & Cochran, J.J. | Statistics for Business and Economics $12^{th}$ edition | Cengage Learning 2014 | |