

THE EDUCATION UNIVERSITY OF HONG KONG

Course Outline

Part I

Programme Title	:	Bachelor of Arts (Honours) in Personal Finance and Bachelor of Education (Honours) (Business, Accounting and Financial Studies); all undergraduate programmes
Programme QF Level	:	5
Course Title	:	Quantitative Analysis in Finance
Course Code	:	BUS1049
Department	:	Department of Social Sciences and Policy Studies
Credit Points	:	3
Contact Hours	:	39
Pre-requisite(s)	:	Nil
Medium of Instruction	:	English
Course Level	:	1

Part II

The University's Graduate Attributes and seven Generic Intended Learning Outcomes (GILOs) represent the attributes of ideal EdUHK graduates and their expected qualities respectively. Learning outcomes work coherently at the University (GILOs), programme (Programme Intended Learning Outcomes) and course (Course Intended Learning Outcomes) levels to achieve the goal of nurturing students with important graduate attributes.

In gist, the Graduate Attributes for Sub-degree, Undergraduate, Taught Postgraduate, Professional Doctorate and Research Postgraduate students consist of the following three domains (i.e. in short "PEER & I"):

- Professional Excellence;
- Ethical Responsibility; &
- Innovation.

The descriptors under these three domains are different for the three groups of students in order to reflect the respective level of Graduate Attributes.

The seven GILOs are:

1. Problem Solving Skills
2. Critical Thinking Skills
3. Creative Thinking Skills
- 4a. Oral Communication Skills
- 4b. Written Communication Skills
5. Social Interaction Skills
6. Ethical Decision Making
7. Global Perspectives

1. Course Synopsis

This course aims to provide students with some of the basic numerical and statistical methods required to perform quantitative analysis in finance. The course will start with some useful data organization and presentation concepts. We will then discuss basic calculus and probability, that are often used in financial and business applications. Students will also learn the frameworks of hypothesis testing and regression analysis for analyzing data and making judgments. Emphasis is placed on the application of quantitative methods in financial and business settings. The course will also include interactive lectures and computer lab sessions for students to have hands-on experience analyzing real-life financial data.

2. Course Intended Learning Outcomes (CILOs)

Upon completion of this course, students will be able to:

- CILO₁ Compute and use basic mathematical techniques, such as differentiation and optimization;
- CILO₂ Critically review, choose and employ the basic statistical concepts and descriptive analysis of data;
- CILO₃ Apply the concepts of random variables and probability distributions of financial data;
- CILO₄ Apply regression models to financial data analysis;
- CILO₅ Formulate implications and conclusions from statistical analysis.

3. Content, CILOs and Teaching & Learning Activities

Course Content	CILOs	Suggested Teaching & Learning Activities
Descriptive statistics: introduction to the types (time series, cross-section, panel, continuous, discrete) and major sources of data that are commonly used in finance; organizing and visualizing data; measures of central tendency and dispersion, as well as correlation.	CILO _{2,3}	Lecture; lecturer-led questions and answers (Q&A); problem-based learning activities; hand-on practices and calculations; group discussions
Basic mathematical techniques: differentiation; optimization.	CILO ₁	Lecture; lecturer-led questions and answers (Q&A); problem-based learning activities; hand-on practices and calculations; group discussions
Probability; discrete and continuous random variables; expectation and variance; joint probability distributions of financial data; covariance; correlation; and independence; normal distribution.	CILO _{3,4}	Lecture; lecturer-led questions and answers (Q&A); problem-based learning activities; hand-on practices and calculations; group discussions
Sampling: samples and populations; random sampling;	CILO _{2,3,4,5}	Lecture; lecturer-led questions and

the distribution of the sample mean; point estimation; properties of estimators (unbiasedness, efficiency); confidence interval estimation.		answers (Q&A); problem-based learning activities; hand-on practices and calculations; group discussions
Hypotheses testing: null and alternative hypotheses; type one and type two errors; test procedures; applications	<i>CILO</i> _{3,4,5}	Lecture; lecturer-led questions and answers (Q&A); problem-based learning activities; hand-on practices and calculations; group discussions
Simple regression analysis: the mechanics of ordinary least squares (OLS) regression and its assumptions; total, explained and residual sums of squares, R^2 . Applying and running a regression in Excel and using financial data.	<i>CILO</i> _{4,5}	Lecture; lecturer-led questions and answers (Q&A); problem-based learning activities; hand-on practices and calculations; group discussions

4. Assessment

Assessment Tasks	Weighting (%)	CILO
(a) Individual Assignments Students will be given individual assignment(s) on the topics discussed in quantitative analysis during the course.	60%	<i>CILO</i> _{1,2,3,4,5}
(b) Final Examination 2-hour examination on all topics discussed in class will be conducted at the end of the course. The coverage of questions is designed as comprehensively as possible throughout the course content on quantitative analysis in finance.	40%	<i>CILO</i> _{1,2,3,4,5}

5. Use of Generative AI in Course Assessments

Please select one option only that applies to this course:

☐ **Not Permitted:** In this course, the use of generative AI tools is not allowed for any assessment tasks.

☒ **Permitted:** In this course, generative AI tools may be used in some or all assessment tasks. Instructors will provide specific instructions, including any restrictions or additional requirements (e.g., proper acknowledgment, reflective reports), during the first lesson and in relevant assessment briefs.

6. Required Text(s)

- Barnett, R.A., Ziegler, M.R., Byleen, K.E. & Stocker, C.J. (2018). *Calculus for Business, Economics, Life Sciences, and Social Sciences* (14th ed.). Pearson.
- Levine, D.M., Szabat, K.A., Stephan, D.F. & Mariappan, P. (2022). *Business Statistics: A First Course* (8th ed.). Pearson.

7. Recommended Readings

- Bennett, J., Briggs, W.L. & Triola, M.F. (2017). *Statistical Reasoning for Everyday Life* (5th ed.). Pearson.
- Black, K. (2023). *Business Statistics for Contemporary Decision Making* (11th ed.). John Wiley & Sons, Inc.
- Camm, J.D., Cochran, J.J., Fry, M.J., Ohlmann, J.W., Anderson, D.R., Sweeney, D.J. & Williams, T.A. (2023). *Statistics for Business & Economics* (15th ed.). Cengage Learning.
- Harshbarger, R.J. & Reynolds, J.J. (2018). *Mathematical Applications for the Management, Life, and Social Sciences* (12th ed.). Cengage Learning.
- Holloway, A. (2023). *Data Analysis in Microsoft Excel: Deliver Awesome Analytics in 3 Easy Steps Using VLOOKUPS, Pivot Tables, Charts And More*.
- Jacques, I. (2018). *Mathematics for Economics and Business* (9th ed.). Pearson.
- Levine, D.M., Stephan, D.F. & Szabat, K.A. (2020). *Statistics for Managers Using Microsoft Excel* (9th ed.). Pearson.
- Peck, R., Olsen, C. & Short, T. (2019). *Introduction to Statistics and Data Analysis* (6th ed.). Cengage Learning.
- Ruppert, D. (2004). *Statistics and Finance: An Introduction*. Springer.
- Slater, J. & Wittry, S. (2019). *Math for Business and Finance: an algebraic approach* (2nd ed.). New York: McGraw-Hill Education.

8. Related Web Resources

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| HyperStat Online Statistics Textbook | https://davidmlane.com/hyperstat/ |
| OpenStax Introductory Business Statistics 2e | https://openstax.org/details/books/introductory-business-statistics-2e |
| OpenStax Calculus Volume 1 | https://openstax.org/details/books/calculus-volume-1 |
| Hong Kong Statistical Society | https://www.hkss.org.hk/ |
| Census and Statistics Department, HKSAR Government | https://www.censtatd.gov.hk/en/ |

9. Related Journals

- The Journal of Financial and Quantitative Analysis*
- Quantitative Finance*
- Mathematical Finance*
- Journal of Finance*
- International Journal of Qualitative Methods*
- Review of Quantitative Finance and Accounting*
- The Review of Financial Studies*

10. Academic Honesty

The University upholds the principles of honesty in all areas of academic work. We expect our students to carry out all academic activities honestly and in good faith. Please refer to the *Policy on Academic Honesty, Responsibility and Integrity* (<https://www.eduhk.hk/re/uploads/docs/000000000016336798924548BbN5>). Students should familiarize themselves with the Policy.

11. Others

Nil

July 2025