

**City University of Hong Kong  
Course Syllabus**

**offered by College of Business  
with effect from Semester A 2022/23**

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**Part I     Course Overview**

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| <b>Course Title:</b>   | <b>Statistical Methods for Business Research</b>   |
| <b>Course Code:</b>  | <b>FB8916</b>  |
| <b>Course Duration:</b>                                      | <b>1 semester</b>  |
| <b>Credit Units:</b>   | <b>3</b>   |
| <b>Level:</b>  | <b>R8</b>  |
| <b>Medium of Instruction:</b>                                | <b>English</b>   |
| <b>Medium of Assessment:</b>                                 | <b>English</b>   |
| <b>Prerequisites:</b><br><i>(Course Code and Title)</i>      | <b>Nil</b>   |
| <b>Precursors:</b><br><i>(Course Code and Title)</i>         | <b>Students must have taken at least one statistics course at undergraduate/postgraduate level</b> |
| <b>Equivalent Courses:</b><br><i>(Course Code and Title)</i> | <b>Nil</b>   |
| <b>Exclusive Courses:</b><br><i>(Course Code and Title)</i>  | <b>Nil</b>   |

## Part II Course Details

### 1. Abstract

This course introduces the statistical concepts and methodology of linear and logistic regression models and structural equation modelling. The curriculum emphasizes the use of these techniques in business research. The course aims to develop students' analytic ability to integrate and apply the knowledge and quantitative skills gained in the course to conduct business research. It also provides students the opportunity to develop their skills in presenting the findings of their own project and explaining the results in written reports.

### 2. Course Intended Learning Outcomes (CILOs)

| No. | CILOs   | Weighting | Discovery-enriched curriculum related learning outcomes (please tick where appropriate) |    |    |
|-----|---|-----------|---|----|----|
|     |   |           | A1  | A2 | A3 |
| 1.  | Evaluate critically the use of regression and structural equation modeling methods in business research and assess their appropriateness, accuracy and limitations. | 40%       | ✓   | ✓  | ✓  |
| 2.  | Formulate business research problems using regression methods and structural equation models and interpret the results of their analyses.                           | 30%       | ✓   | ✓  | ✓  |
| 3.  | Demonstrate competence in using popular statistical software packages to analyze business data with regression and structural equation modeling methods.            | 20%       |   | ✓  | ✓  |
| 4.  | Communicate and present the results effectively in written, oral and electronic formats.  | 10%       |   | ✓  | ✓  |
|     |   | 100%      |   |    |    |

*A1: Attitude*

*Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.*

*A2: Ability*

*Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.*

*A3: Accomplishments*

*Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.*

### 3. Teaching and Learning Activities (TLAs)

| TLA                          | Brief Description  | CILO No. |   |   |   |  |  | Hours/week (if applicable) |
|------------------------------|--|----------|---|---|---|--|--|----------------------------|
|                              |  | 1        | 2 | 3 | 4 |  |  |                            |
| Lecture                      | Concepts and specific subject knowledge are explained  | ✓        | ✓ |   |   |  |  | 2.0                        |
| Class Discussion             | Research problems and research papers are given in class for discussion. Students will be asked to explore possible solutions to these problems and evaluate methods employed in the papers.   |          | ✓ | ✓ |   |  |  | 0.5                        |
| Computer Laboratory Sessions | Computer laboratory sessions provide demonstration and hand-on experience of using statistical packages to analyse datasets. Students have to formulate the research problems into a statistics model and analyze the data with the support of the statistical packages. | ✓        | ✓ | ✓ |   |  |  | 0.5                        |
| Project                      | Research problems with data are assigned to the class. Students, who can work as group, have to integrate the techniques learned in the course to analyze the dataset... Interpretations of the results have to be presented in written or oral format.                  | ✓        | ✓ | ✓ | ✓ |  |  | N.A.                       |

#### 4. Assessment Tasks/Activities (ATs)

| Assessment Tasks/Activities                           | CILO No. |   |   |   |  |  | Weighting | Remarks   |
|---|----------|---|---|---|--|--|-----------|---|
|   | 1        | 2 | 3 | 4 |  |  |           |   |
| Continuous Assessment: 60 %                           |          |   |   |   |  |  |           |   |
| Group project   | ✓        | ✓ | ✓ | ✓ |  |  | 30%       | To assess students' understanding of the course material, their teamwork and collaborative skills and their ability to effectively communicate their results to others. |
| In-class participation (computer laboratory sessions) | ✓        | ✓ | ✓ |   |  |  | 10%       | Attendance of laboratory sessions and successful execution of lab exercises   |
| Individual assignment                                 | ✓        | ✓ | ✓ |   |  |  | 20%       | To assess students' understanding of concepts, and their ability to put the material learnt into practice and interpret the results.                                    |
| Examination: 40 % (duration: 3 hours )                |          |   |   |   |  |  |           |   |
| Examination   | ✓        | ✓ | ✓ |   |  |  | 40%       |   |
|   |          |   |   |   |  |  | 100%      |   |

## 5. Assessment Rubrics

Applicable to students admitted in Semester A 2022/23 and thereafter

| Assessment Task           | Criterion  | Excellent<br>(A+, A, A-)  | Good<br>(B+, B)  | Marginal<br>(B-, C+, C)  | Failure<br>(F)  |
|---------------------------|--|---|--|--|---|
| 1. Group project          | Evidence of original thinking, organisation, ability to analyse, and grasp of knowledge. | Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.  | Sufficient evidence of original thinking, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with course materials.  | Some to little evidence of original thinking, little evidence of critical capacity and analytic ability; reasonable understanding of course materials.   | No evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of course materials.    |
| 2. In-class participation | Understanding of key concepts and definitions, willingness to participate.               | Strong evidence of showing understanding of key concepts and definitions; clearly and correctly state most critical points and important contributions of the assigned questions or problems; high participation and excellent presentation skills. | Sufficient evidence of showing understanding of key concepts and definitions; clearly and correctly state some critical points and contributions of the assigned questions or problems; high participation and good presentation skills. | Evidence of showing some understanding of the subject; demonstrate some ability to develop solutions to simple and basic problems in the assigned questions and problems. Some may only state a few critical points and marginal contributions of the assigned questions and problems. | Do not show any participation   |
| 3. Individual assignment  | Evidence of original thinking, organisation, ability to analyse, and grasp of knowledge. | Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.  | Sufficient evidence of original thinking, sufficient evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with methods learned.   | Some to little evidence of original thinking; some to little understanding of the subject; some evidence of familiarity with methods learned.  | Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of methods learned. |

|                |  |  |   |  |  |
|----------------|--|--|---|--|--|
| 4. Examination | Evidence of original thinking, organisation, ability to analyse, and grasp of knowledge. | Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. | Sufficient evidence of original thinking; sufficient evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with course materials. | Some to little evidence of original thinking; some to little evidence of critical capacity and analytic ability; some understanding of issues; some evidence of familiarity with course materials. | Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of course materials. |
|----------------|--|--|---|--|--|

Applicable to students admitted before Semester A 2022/23

| Assessment Task           | Criterion  | Excellent (A+, A, A-)  | Good (B+, B, B-)   | Fair (C+, C, C-)  | Marginal (D)   | Failure (F)  |
|---------------------------|--|--|--|---|--|--|
| 1. Group project          | Evidence of original thinking, organisation, ability to analyse, and grasp of knowledge. | Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.                               | Sufficient evidence of original thinking, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with course materials.        | Some evidence of original thinking, little evidence of critical capacity and analytic ability; reasonable understanding of course materials.                              | Little evidence of original thinking, little evidence of critical capacity and analytic ability; reasonable understanding of course materials. | No evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of course materials. |
| 2. In-class participation | Understanding of key concepts and definitions, willingness to participate.               | Strong evidence of showing understanding of key concepts and definitions; clearly and correctly state most critical points and important contributions of the assigned questions or problems; high | Sufficient evidence of showing understanding of key concepts and definitions; clearly and correctly state some critical points and contributions of the assigned questions or problems; high | Evidence of showing some understanding of the subject; demonstrate some ability to develop solutions to simple and basic problems in the assigned questions and problems. | State a few critical points and marginal contributions of the assigned questions and problems.   | Do not show any participation  |

|                          |  |  |   |  |  |  |
|--------------------------|--|--|---|--|--|--|
|                          |  | participation and excellent presentation skills.   | participation and good presentation skills.   |  |  |  |
| 3. Individual assignment | Evidence of original thinking, organisation, ability to analyse, and grasp of knowledge. | Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. | Sufficient evidence of original thinking, sufficient evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with methods learned.  | Some evidence of original thinking; some understanding of the subject; some evidence of familiarity with methods learned.  | Little evidence of original thinking; little understanding of the subject; some evidence of familiarity with methods learned.  | Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of methods learned.  |
| 4. Examination           | Evidence of original thinking, organisation, ability to analyse, and grasp of knowledge. | Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. | Sufficient evidence of original thinking; sufficient evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with course materials. | Some evidence of original thinking; some evidence of critical capacity and analytic ability; some understanding of issues; some evidence of familiarity with course materials. | Little evidence of original thinking; little evidence of critical capacity and analytic ability; some understanding of issues; some evidence of familiarity with course content. | Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of course materials. |

## Part III Other Information

### 1. Keyword Syllabus

1. Introduction  
Review of basic knowledge on statistics. Overview of the concepts of regression analysis and structural equation modelling.
2. Linear regression model  
Formulation and assumptions of a multiple linear regression model. Inference of regression parameters. Goodness of fit measures. Hypothesis testing. Use of dummy variables. Sequential testing,  $C_p$ , forward, general-to-specific modelling.
3. Logistic regression model  
Binary logit. Odds versus probability. Likelihood ratio test. Unordered and ordered multinomial logit. Latent variable. Assumption of independence of irrelevant alternative (IIA).
4. Path analysis  
Endogenous and exogenous variables. Manifest and latent variables. Simple path diagrams, Recursive and non-recursive models.
5. Measurement models  
Exploratory versus confirmatory factor analysis. Second order factor analysis, Model identification, estimation, testing and modification.
6. Structural models  
Identification, Measures of fit, Model re-specification, Mediation, Moderation

### 2. Reading List

#### 2.1 Compulsory Readings

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|----|--|
| 1. | Dielman, T.E. (2004), <i>Applied Regression Analysis</i> , 4 <sup>th</sup> edition, Brooks/Cole.   |
| 2. | Menard, S. (2001), <i>Applied Logistic Regression Analysis</i> , 2 <sup>nd</sup> edition, SAGE Publications Inc.                               |
| 3. | Raykov, T. and Marcoulides, G.A. (2006), <i>A First Course in Structural Equation Modelling</i> , 2 <sup>nd</sup> edition, Taylor and Francis. |
| 4. | Rex B. Kline (2011). <i>Principles and Practice of Structural Equation Modeling</i> , 3 <sup>rd</sup> edition, The Guilford Press.             |

#### 2.2 Additional Readings

Nil