Master of Science in Business and Data Analytics (Information Systems Management Stream)

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1.   AIM AND OBJECTIVES

This conversion master programme is suitable for Bachelor degree holders of any disciplines with the curricula covering appropriate mathematical background knowledge (e.g., Advanced Algebra), and who are interested in learning state-of-the-art business data analytics and management skills. The programme also cultivates existing information systems (IS) professionals who have already been the employees of some companies in Hong Kong or elsewhere to upgrade their professional skills related to various aspects of business information management function.

Given the diversity of the first degree background of our students, few assumptions can be made as to their technical knowledge related to information technologies adopted in organizations. The programme is therefore designed to provide a common base of business data analytics topics such as database management systems, big data and social media analytics, analytical programming with python, statistical data analysis, data mining, and so on, together with four elective courses covering more advanced topics relevant to the business data analytics function for organizations of the business, commercial, industrial and public sectors.

Aim

> This programme aims to cultivate students with professional knowledge of business data analytics through active learning of the theories, methods, supporting techniques across a wide range of knowledge areas such as applied statistics, big data management, data mining, and social media analytics.

Objectives

> Upon successful completion of this programme, students should be able to:
>
> i)   Describe theories, methods and techniques for analysis of complex data structures arising from business applications;
>
> ii)   Apply data analytics to design and build data-driven solutions to enhance business decision-making;
>
> iii)   Understand and competence in the key concepts and techniques in different areas of statistic;
>
> iv)   Apply quantitative knowledge to solve business problems and to make decision;
>
> v)   Use appropriate statistical or analytics software to investigate and solve business problems.

2. PROGRAMME STRUCTURE

2.1 Required Core Courses: (18 credits)

Course Code	Course Title	Level	Units Worth	Semester
IS5312	Analytical Programming with Python	P5	3	A
MS5217	Statistical Data Analysis	P5	3	A
MS5218	Applied Linear Statistical Models	P5	3	A
IS6941	Big Data and Social Media Analytics	P6	3	B
IS5413	Database Management Systems	P5	3	B
MS6711	Data Mining	P6	3	B

Note: Full-time student should exactly follow the core course enrolment schedule as depicted in the table above if s/he wants to complete the programme in 12 months.

2.2 Programme Electives: (12 credits)

MSc BDA (ISM Stream) students must earn at least 12 credit units from elective courses offered either in Semester A or Semester B in each academic year. Students may also consider taking elective courses in the summer term. However, only a few electives are offered in the summer term.

MSc BDA (ISM) students must obtain at least 9 credits from the elective courses listed below.

Course Code	Course Title	Level	Units Worth	Semester
IS6321	Business Intelligence Applications	P6	3	A
IS5740	Management Support and Business Intelligence Systems	P5	3	A
IS5540	Project Management and Quality Assurance	P5	3	A
IS6400	Business Data Analytics	P6	3	B
IS6200	Blockchain Technology and Business Applications	P6	3	B
IS6335	Data Visualization	P6	3	A
IS6921	Knowledge Management	P6	3	B
IS6912	Information Systems Project	P6	6	A and B
IS5940	Innovation and Technology Entrepreneurship	P5	3	Summer

The remaining 3 credits can be obtained from the list of IS courses below, or from any postgraduate elective courses offered by any departments within the College of Business.

Course Code	Course Title	Level	Units Worth
IS6914	Information Systems Management Project	P6	3
IS6930	Management Consulting in Asia	P6	3
IS5311	Business Software Construction	P5	3
IS5313	Foundations of Information and Electronic Business Systems	P5	3
IS5314	eBusiness System Integration	P5	3
IS5411	Systems Analysis and Design	P5	3
IS5542	Outsourcing and Offshoring Management	P5	3
IS5743	Information Technology Based Business Transformation	P5	3
IS6000	Research Methods for the Manager	P6	3
IS6322	Internet and World-Wide Web Applications Development	P6	3
IS6421	Human-Computer Interaction and Multimedia	P6	3
IS6523	Information Systems Infrastructure and Security Management	P6	3
IS6600	Global Information Systems and Knowledge Management Applications in Organizations	P6	3
IS6602	Global Information Technology & Knowledge Management Consulting	P6	3

** Any postgraduate level courses offered by the Department of Information Systems but not listed in the table above can also be taken by MSc BDA (ISM) students.

2.3   Master Award

A minimum of 30 credit units should be achieved for the Master award. Full-time students normally complete the 30 credit units in 12 months, while part-time students earn all required credit units in 24 months. If a student fails in a prescribed course (either a core course or an elective course), s/he may not be able to complete the programme within the minimal period. For example, **if a full-time student fails in any one course, s/he will finish the programme in more than one year.**

2.4 Continuing Education Fund (CEF)*

The following courses may be eligible for the application of a subsidy from the CEF and each applicant may receive up to HK$20,000. Please visit the CEF web site http://www.wfsfaa.gov.hk/cef/en/index.htm on application procedure.

CityU Course Code	Course Title Registered at CEF	CEF Course Code (under City University of Hong Kong, institution code 005)
IS5413	Database Management Systems	33Z131203
IS6941	Big Data and Social Media Analytics	33Z131211
IS6200	Blockchain Technology and Business Applications	33Z131181
IS6400	Business Data Analytics	33Z13119A

* Applicable to Hong Kong residents
Please refer to the CEF web site on eligibility of the applicants
http://www.wfsfaa.gov.hk/cef/en/index.htm

3. ASSESSMENT AND COURSE GRADES

3.1 Assessment

Assessment must be conducted so as to ensure, as far as possible, that all candidates are fairly and equally treated and to ensure that academic honesty is always maintained.

Unless otherwise determined by Senate for a specific course or programme, the medium of instruction and assessment at the University is English.

Departments must establish Assessment Panels for courses offered by the Department. The Assessment Panels are chaired by the Head of Department or his designate, and must include the Course Examiner(s) for the course(s) being considered. Where necessary, College Board may approve equivalent alternative arrangements. No course may be considered by more than one Assessment Panel.

The duties of an Assessment Panel are:

(a) To maintain the academic standard of the assessment of the courses for which the Panel is responsible.

(b) To determine the grades of students for courses completed in the semester.

(c) Once grades are determined, to inform the Chow Yei Ching School of Graduate Studies to publish the grades.

The course grades approved by the relevant Assessment Panel are final, unless under Academic Regulation 11 a review of a decision is required. The student should first contact the Course Examiner and the relevant staff member responsible for the assessment with a view to resolving the matter informally. However, if the student's concern regarding course grades cannot be resolved by informal means, the student may seek resolution via the formal procedures.

A formal request for review of course grades must be made in writing to the Dean of College/School offering the course within 30 calendar days of the announcement of grades by the University. The written application must:

(a) state the grounds on which the request for review is made;
(b) include a description of the relevant facts; and
(c) provide supporting evidence.

Upon receipt of the formal request for review, the Dean of the College/School will determine whether or not a *prima facie* case for review has been established. If, in the view of the Dean of the College/School, there is no *prima facie* case, then the request will be dismissed and the decision conveyed to the student no later than 44 calendar days following the announcement of grades by the University.

If, in the view of the Dean of the College/School, there is a *prima facie* case, then he/she will refer the matter to the College/School Grade Review Committee for consideration. The Committee may interview the student and staff members concerned. The Committee will record its proceedings and resolutions.

If the Committee determines that the case is substantiated, the decision will be conveyed to the Assessment Panel to decide the action to be taken. The Assessment Panel will report back to the College/School Grade Review Committee any decisions taken on cases referred via this procedure.

The decision on the formal review will be communicated in writing to the student by the Dean of the College/School with a brief statement of the reasons for the decision. The decision should be conveyed to the student no later than 60 calendar days following the announcement of grades by the University.

3.2 Course Grades

Assessment Panels must grade courses according to the following schedule.

Letter Grade	Grade Point	Grade Definitions	
A+	4.3		The qualifiers, such as "Excellent", "Good", "Fair" etc., define student performance with respect to the achievement of course intended learning outcomes (CILOs).
A	4.0	Excellent	
A-	3.7		
B+	3.3		
B	3.0	Good	
B-	2.7		
C+	2.3		
C	2.0	Fair	
C-	1.7		
D	1.0	Marginal	
F	0.0	Failure	
P		Pass	
Operational Grades			
IP	In Progress		An IP grade is shown where students will register for the same course in the subsequent semester/term to complete the assessment of the course.
I	Incomplete		A grade of incomplete may be granted (i) where there are extenuating circumstances that have prevented a student from completing required work, or attending the examination; (ii) at the discretion of the Assessment Panel. Where an "I" grade is assigned, the Assessment Panel may approve a schedule for the completion of work, or a supplementary examination. An alternative grade should be assigned no later than four weeks after the "I" grade is first reported or as soon as practicable thereafter.
S	Dissertation Submitted		In a dissertation-type course, an S grade is assigned by the Course Leader when a student's dissertation has been submitted for assessment.
TR	Credit Transfer		Assigned when a student is granted transferred credit units for the course.
Z	Exemption		Assigned when a student is exempted from the course.
AU	Audit		An audited grade is assigned when an auditing student has completed the conditions established at registration as an auditor. No assessment is made or grade awarded for auditing.
X	Late Drop		Assigned when a student is permitted to drop the course after the add/drop deadline.

WD	Withdrawn	Assigned when a student has registered for the course in a semester/term and subsequently submitted a notification of withdrawal from the University.

Students assigned a grade of D or better, or a Pass grade in a pass-fail course, earn credit units for the course. Grades of F, IP, I, S, Z, AU, X and WD do not earn credit units.

A grade with an asterisk (e.g. B+*) is excluded from the calculation of the GPA. The credits earned will not be counted toward the minimum credit requirement for graduation but will be counted toward the maximum number of credit units permitted.

Grades of P, IP, I, S, TR, Z, AU, X and WD are not counted in the calculation of a student's CGPA. Grades of F are counted, unless the fail is recovered under the section of "Repeating Courses to Improve Grades" in Academic Regulations.

Grades of P, IP, I, S, TR, Z, AU, X and WD are not counted in the calculation of a student's SGPA.

Note 1:
Except "dissertation-type" courses, students may repeat a course, or equivalent course, to recover a failure or to improve a course grade of C or below. After the first attempt, only **two repeat attempts** are permitted. Course grades for all attempts will appear on the student's transcript, but only the final grade earned will be included in the calculation of the student's CGPA.

Note 2:
Students who failed in any courses (core courses or elective courses) of the MSc BDA programme should expect that they cannot complete the programme within the minimal study period, that is, one year for full-time students or two years for part-time students!

4.   ACADEMIC STANDING FOR POSTGRADUATE STUDENTS

Academic standing provides an indicator of the student's academic progress and identifies students in academic difficulty needing academic advising and extra help. The four levels of academic standing are defined as follows:

Standing	Definitions
Good Standing	Students are making satisfactory academic progress.
Academic Warning	Students' most recent academic performance has been unsatisfactory, or their overall academic average is below minimum requirements. Students on warning should seek advice from their academic advisor.
Academic Probation	Students' most recent academic performance has been extremely unsatisfactory, or their overall academic average has continued to be below the minimum requirements for graduation. Students on Academic Probation will be assigned an academic advisor by their home academic unit, and will not be permitted to register in courses in the following semester without the approval of the academic advisor. The home academic unit may also require students on Academic Probation to take a reduced study load and/or to fulfil specific conditions such as GPA attainments in the following semester.
Academic Suspension	Students who cannot benefit from course registration in the next semester may be suspended for an approved period of not less than one semester. Academic Suspension is designed to provide students with an opportunity to resolve the problems that are preventing them from making academic progress.
Operational Standing	
Review	A temporary status indicating that a student's performance is unsatisfactory and has been referred to the student's home academic unit for making a decision on the academic standing.

5. ILLNESS OR OTHER CIRCUMSTANCES AFFECTING STUDENTS' ASSESSMENT (EXAMINATION/COURSEWORK)

A student who believes that his/her performance in an examination, or ability to attend an examination, or in-course assessment, has been adversely affected by circumstances beyond his/her control must submit the case, with documentary evidence, to his/her home department following the procedures stated on the University website, within 5 calendar days of the scheduled date for completing the affected examination or assessment.

The home department of the student will investigate the case. Only **compelling reasons** such as illness, hospitalization, accident, family bereavement or other unforeseeable serious personal or emotional circumstances will be considered.

If the case is justified and substantiated, the decision will be conveyed to the Assessment Panel which will determine whether to offer the student a make-up examination or coursework or other alternative assessment. The Assessment Panel may also adjust the grade of the student if deemed appropriate.

Procedures

Students have to provide the information to their home department offering the programme in which they are enrolled. For students from the College of Business, please submit the mitigation request online.

https://www.cb.cityu.edu.hk/student/mitigation/index.cfm?page=Login

Examples of acceptable extenuating circumstances are given below. This is for general guidance only and is not intended to be exhaustive or definitive. The department considers each individual case on its own merits.

Long Term Illness	An original letter or certificate from a registered medical practitioner confirming the nature of the illness and the likely impact it had on the student's ability to undertake assessment.
Short Term Illness	An original letter or certificate from a registered medical practitioner. A short term illness such as cold, headache, stomach upsets, etc. will not normally be regarded as an extenuating circumstance with regard to assessed coursework, where the student is given a number of weeks/months to complete and submit such work.
Hospitalization	An original medical letter/certificate from the relevant hospital confirming the period of hospital confinement and the nature and severity of the student's circumstances and the likely impact it had on the student's ability to undertake assessment.
Bereavement	A death certificate and supporting documentation where there is a demonstrably close relationship between the student and the deceased.

Serious Personal or Emotional Circumstances	An original letter or certificate from an appropriate professional confirming the nature and severity of the student's circumstances and the likely impact it had on the student's ability to undertake assessment.

Examples of the kind of circumstances that are normally **not considered** as acceptable are given below:

Transport issues	It is the students' responsibility to ensure that they arrive at the examination on time, irrespective of the form of transport used or relied upon.
Misreading the examination timetable	It is the students' responsibility to ensure that they know and remember the location and time of all formal assessments.
Stress	Stress as a result of examination pressure is a common experience of many students and is not considered to be an acceptable extenuating circumstance.
Holidays	Students should not arrange to travel on holiday during the examination period. Holiday travel is not considered to be an acceptable extenuating circumstance.

Mitigation requests received from students should be handled expeditiously by the parties concerned.

IMPORTANT NOTE

Students are advised to go through the "Academic Regulations for Taught Postgraduate Degrees" via the home page of Chow Yei Ching School of Graduate Studies.

http://www.sgs.cityu.edu.hk/student/TPg/regulations/acadreg

6. CLASSIFICATION AND CONFERMENT OF AWARDS

The University grants awards with classifications as follows:

Award	Classification
Postgraduate Certificates/ Diplomas/Master's Degrees	Distinction Credit Pass

Students may be granted a postgraduate award only if they have achieved a Cumulative Grade Point Average (CGPA) of 2.00, or above.

Where a student's Semester Grade Point Average (SGPA) falls below 2.0 (for postgraduate student), the student is warned and the relevant College Examination Board is informed. The College Examination Board will then consider appropriate action, including the termination of the student's studies.

Where the student's record indicates that the student may have difficulty successfully completing the requirements for an award, the relevant College Examination Board is informed. Where the Board is satisfied that the student cannot reasonably expect to complete the award, the Board will terminate the student's studies.

Note: **Cumulative Grade Point Average (CGPA)**

$$\text{CGPA} = \frac{\sum_{i=1}^{n} G_i U_i}{\sum_{i=1}^{n} U_i}$$

Where G is the grade point awarded and U is the credit units earned for the ith course. CGPA is calculated for courses taken during enrolment for a specific programme.

Semester Grade Point Average (SGPA)

The GPA calculated for all the courses taken in one semester, including failed courses, but excluding courses graded P, I, IP, S, WD, X and AU.

7. GENERAL STUDENT GUIDE

The Chow Yei Ching School of Graduate Studies (SGS) provides detailed and up-to-date information on Academic Regulations, Assessment & Examinations, Programme & Course Information, Student Discipline, Student Records, Student Services etc. You are recommended to visit it at http://www.cityu.edu.hk/sgs for details.

8. DEPARTMENT CONTACT INFORMATON (2021-22 Academic Year)

Position	Name	Telephone	Email
Programme Leader (MScBDA-ISM Stream)	Dr Raymond LAU	3442 8495	raylau@cityu.edu.hk
General Office Enquiry		3442 8521	isgo@cityu.edu.hk
Fax		3442 0370	
Programme Web-site	http://www.cb.cityu.edu.hk/is/msbda		
IS Department Web-site	http://www.cityu.edu.hk/is/		

Course Title	:	Analytical Programming with Python
Course Code	:	IS5312
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**

   This course aims to:

   The aim of this course is to introduce the students to advanced business programming concepts and skill, with emphasis on business information systems construction. On completion of this course, student should be able to: a) understand object-oriented programming; b) understanding basic algorithms; c) construct simple business software application to solve a particular business problem by integrating OO, multimedia, files and database technologies.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Design and develop appropriate object oriented programming skill for business software construction.	30%			
2.	Design and develop appropriate multimedia for business software construction.	20%	✓	✓	✓
3.	Design and develop appropriate persistent storage, such as files and databases for business software construction.	25%	✓	✓	✓
4.	Develop basic data structures and algorithms for business software construction.	25%			
	If weighting is assigned to CILOs, they should add up to 100%.	100%			

* If weighting is assigned to CILOs, they should add up to 100%.
[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)**
(TLAs designed to facilitate students' achievement of the CILOs.)

Lecture	:	13 hours
Laboratory	:	26 hours

TLA	Brief Description	CILO No.				Hours/week
		1	2	3	4	(if applicable)
TLA1: Lecture	Concepts and general knowledge of advanced business information systems construction are explained. Furthermore, advanced business software construction knowledge and skills, such as object oriented programming, multimedia, files and databases, and basic data structures and algorithms are explained and illustrated using examples to enable students understanding on constructing business information system construction and practical characteristics.	✓	✓	✓	✓	
TLA2: Laboratory	During laboratory sessions, the following activities are used to reinforce and practice of various business software construction techniques learnt in lectures. *Exercises:* Hands-on activities using a programming tool (e.g., Microsoft Visual Basic) as part of systems development exercises.	✓	✓	✓	✓	
TLA3: Project	Students would have to complete a project requiring them to perform systems development activities, aimed at constructing a practical application prototype for business information system construction.	✓	✓	✓	✓	

4. **Assessment Tasks/Activities (ATs)** *(ATs are designed to assess how well the students achieve the CILOs.)*

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
AT1: Continuous Assessment Participation in class and lab sessions in activities such as: - a number of take-home exercises - class performance - class quizzes	✓	✓	✓	✓	30%	
AT2: Mini-Project Each students will design and develop a proposed business information system, by using appropriate techniques	✓	✓	✓	✓	20%	
AT3: Individual Lab Test The individual lab test is to assess students' overall competence level in the domain areas.	✓	✓	✓	✓	50%	
* The weightings should add up to 100%.					100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Continuous Assessment	Capability to design and develop appropriate object oriented programming skill for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design and develop appropriate multimedia for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design and develop appropriate persistent storage, such as files and databases for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to develop basic data structures and algorithms for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Project	Capability to design and develop appropriate object oriented programming skill for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design and develop appropriate multimedia for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design and develop appropriate persistent storage, such as files and databases for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to develop basic data structures and algorithms for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3: Individual Lab Test	Capability to design and develop appropriate object oriented programming skill for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design and develop appropriate multimedia for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design and develop appropriate persistent storage, such as files and databases for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to develop basic data structures and algorithms for business software construction.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information

1. **Keyword Syllabus**

(An indication of the key topics of the course.)

Object oriented programming, Multimedia, Files, Data structure and algorithms.

Detailed Syllabus:

• Classes and objects
• Inheritance and Polymorphism
• Multimedia applications
• Files and Database connections
• Basic data structures and algorithms for business software solutions
• Business software application examples

2. **Reading List**

2.1 **Compulsory Readings**

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	David Schneider, "An Introduction to Programming Using Python", Pearson Education, 2 February 2015.

2.2 **Additional Readings**

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Tony Gaddis, "Starting Out with Python", 4th edition, Pearson, March 2017
2.	Tony Gaddis, "Starting Out with Java, From Control Structures through Objects", 7th Edition, Pearson, 2018.
3.	https://docs.python.org/3/tutorial/index.html

Course Title	:	Statistical Data Analysis
Course Code	:	MS5217
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	MS5212 Statistical Methods I
Exclusive Courses	:	MS5312 Business Statistics

Course Details

1.   Abstract

The aims of this course are to

- Provide students with the statistical concepts and methods used in solving business problems;

- Develop students' analytic ability to integrate and apply the knowledge and statistical techniques learned in the course to solve business problems.

2.   Course Intended Learning Outcomes (CILOs)
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Identify the key issues of a business problem; and formulate these issues into statistical models for further analysis.	N/A	✓	✓	✓
2.	Apply the statistical knowledge acquired through the course to select the most appropriate technique for a given problem.	N/A	✓	✓	✓
3.	Analyze relevant data effectively using appropriate statistical techniques to solve the problems and evaluate the results in the context of the problems	N/A		✓	✓
4.	Develop the ability to use statistical packages to conduct statistical analysis.	N/A		✓	✓
	* If weighting is assigned to CILOs, they should add up to 100%.	N/A			

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

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	Students work in groups to discuss real business problems and cases, and to explore possible solutions. The instructor provides instant feedback and support for students' queries.	✓	✓	✓	✓	0.5
In-class exercise	With the teacher acting as a facilitator, students work together on assigned problem sets to consolidate their understanding of the concepts and methods. They are required to formulate the problem into a mathematical model (the concept) and proceed to solve the problem (the method). Although these are standard textbook exercises, these exercises have real-life applications.	✓	✓	✓	✓	0.5

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 40%						
Assignment	✓	✓	✓	✓	20%	
Test	✓	✓	✓	✓	20%	
Examination: 60% (duration: 3 hours, if applicable)						
Examination	✓	✓	✓		60%	
					100%	

5. Assessment Rubrics
(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1.Assignment	Core concepts, ideas and use of statistical software	Strong evidence of knowing how to apply the relevant techniques and software in performing statistical analysis	Evidence of knowing how to apply the relevant techniques and software in performing statistical analysis	Some evidence of knowing how to apply the relevant techniques and software in performing statistical analysis.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the assignment	Little evidence of familiarity with the subject matter;
2. Test	Little evidence of familiarity with the subject matter;	Strong evidence of	Strong evidence of	Some evidence of	Sufficient familiarity	Little evidence of

		original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base	original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base	grasp of subject, little evidence of critical capacity and analytic ability; reasonable understanding of issues.	with the subject matter to enable the student to progress without repeating the case report.	familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.
3. Examination	Core concepts and ideas; use of appropriate statistical methods	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.	Student who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the course	Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature

Other Information

1. Keyword Syllabus

(An indication of the key topics of the course.)

1. Introduction

Data collection methods – survey and experimental studies. Data description.

2. Sampling distribution

Random sampling, Random variables, Binomial distribution, Normal distribution, Sampling distribution of a

statistic, Central Limit Theorem.

3. One Population Case: Estimation

Point estimation and interval estimation of population mean, proportion and variance.

4. One Population Case: Hypothesis Testing

Elements of a statistical test, Type I and Type II errors, Test on a population mean, proportion and variance, p-

value, Power of a test, Relation between hypothesis testing and confidence interval estimation.

5. Comparison of two populations

Inference concerning two population means, proportions and variance.

6. Comparison of several populations

Chi-square tests. Comparison of several population means, proportions and variance.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Levine, D.M., Stephen, D.F., Krehbiel, T.C. and Berenson, M.L., Statistics for Managers (most recent edition)
2.	Mendenhall, W., Beaver, R.J. and Beaver, B.M., A Brief Course in Business Statistics (most recent edition)
3.	Keller, G. and Warrack, B., Statistics for Management and Economics, Duxbury (most recent edition)
4.	Carlson, W., Newbold, P. and Thorne, B., Statistics for Business and Economics (most recent edition)

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

Nil

Course Title	:	Applied Linear Statistical Models
Course Code	:	MS5218
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	MS5213 Statistical Methods II
Exclusive Courses	:	Nil

Course Details

1. Abstract

The aims of this course are to

- introduce the statistical concepts and methodology of linear statistical models. The curriculum emphasizes the use of regression modeling and analysis of variance techniques in solving business problems.
- develop students' analytic ability to integrate and apply the knowledge and quantitative skills, in particular linear statistical model methods, gained in the course to solve business problems.
- provide students with the opportunity to develop their skills in presenting the findings of their own project and explaining the implications of the results in a written report.

2. Course Intended Learning Outcomes (CILOs)
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Formulate real-world business problems using linear model methods and interpret the results of their analyses	N/A	✓	✓	✓
2.	Formulate real-world business problems using linear model methods and interpret the results of their analyses	N/A	✓	✓	
3.	Demonstrate competence in using popular statistical software packages to analyze business data with linear model methods.	N/A		✓	✓
4.	Provide an opportunity for students to communicate the results effectively in written and electronic formats using common business practice such as the preparation and presentation of reports.	N/A		✓	✓

* If weighting is assigned to CILOs, they should add up to 100%.   N/A
 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No. 1	2	3	4	Hours/week (if applicable)
Lecture	Concepts and specific subject knowledge are explained	✓	✓			2.0
Class discussion	Problem and cases are given in class for iscussion. Students will be asked to explore possible olutions to these problems and cases. The instructor will provide instant feedback and support for students' queries.		✓	✓		0.5
Computer laboratory sessions	Provide demonstration and hand-on experience of using statistical packages to analyse data sets. They have to formulate the problems into a statistics model and analyze the data with the support of the statistical packages.	✓	✓	✓		0.5
Project	A real-life case with data is assigned to the class. Students have to analyze and explore issues related to the case. Then, they have to integrate the techniques learned in the course to analyze the data set and design an efficient solution for the problems presented in the case. Details of the findings have to be summarized in a written report.	✓	✓	✓	✓	N.A.

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No. 1	2	3	4	Weighting*	Remarks
Continuous Assessment: 40%						
Project/Assignment	✓	✓	✓	✓	20%	
Test	✓	✓	✓		20%	
Examination: 60% (duration: 3 hours, if applicable)						
Examination	✓	✓	✓		60%	
					100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
Project /Assignment	Ability in using the appropriate statistical methods to solve the business problem	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.	Evidence of original thinking, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.	Little evidence of original thinking, little evidence of critical capacity and analytic ability; reasonable understanding of issues.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the case report.	Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.
Test	Core concepts and ideas; use of appropriate statistical methods	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.	Some evidence of grasp of subject, little evidence of critical capacity and analytic ability; reasonable understanding of issues.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the case report.	familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.
Examination	Core concepts and ideas; use of appropriate statistical methods	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.	Student who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.	Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature

Other Information

1. Keyword Syllabus

(An indication of the key topics of the course.)

1. Simple Linear Regression
Concept of linear models. Linear regression with one predictor variable. Inference in regression and correlation analysis. Estimation of mean responses. Prediction intervals for new observations.

2. Multiple Regression Model
Formulation and assumptions of a multiple regression model. Inference of the regression parameters. General form of hypotheses testing. Sums of squares.

3. Regression Models for Quantitative and Qualitative Variables
Polynomial models. Indicator variables. Piece-wise linear regression model. Modeling interactions between quantitative and qualitative variables.

4. Model Building and Variable Selection
Standard criteria for comparing models. Cp and other criteria. Sequential F-ratios. Forward, backward and stepwise selection regression. Cp statistic and other criteria. Multi-collinearity.

5. Diagnostics and Remedial Measures
Diagnosis of residuals. Remedial actions when model assumptions are violated. Transformation of variables.

6. Analysis of Variance
One-way ANOVA. Randomized complete block designs. Multi-factor studies. Interaction effects. Strategy for analysis and planning of multi-factor studies.

2. Reading List
2.1 Compulsory Readings
(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Kleinbaum D G, Kupper L L, Muller K E and Nizam A, Applied Regression Analysis and Other Multivariable Methods, Thomson
2.	Mendenhall W and Sincich T, A Second Course in Statistics: Regression Analysis, Pearson
3.	Dielman T E, Applied Regression Analysis for Business and Economics, Duxbury
4.	Kutner M H, Nachtsheim C J and Neter J, Applied Linear Regression Models, McGraw-Hill

2.2 Additional Readings
(Additional references for students to learn to expand their knowledge about the subject.)
Nil

Course Title	:	Database Management Systems
Course Code	:	IS5413
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**

   This course aims to introduce the basic concepts of database systems. It covers database models and languages for the physical design and implementation, and design methods for the conceptual and logical design of database applications.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Explain the role of database users and features of database systems, and architecture of database systems.	25%			
2.	Design a small database application using entity-relationship method and relational database design theory.	50%	✓	✓	
3.	Implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	25%	✓	✓	
	* If weighting is assigned to CILOs, they should add up to 100%.	100%			

Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.			Hours/week (if applicable)
		1	2	3	
TLA1. Lecture	Concepts relating to databases and database users, DBMS concepts and its architecture, record storage and file organisation, index structures for files.	✓			
TLA2. Demonstrations	Methods and techniques of database modelling using entity-relationship (E-R) method, functional dependencies and normalisation for relational databases, relational database design methods and design process.		✓		
TLA3. Lab Workshops	Hands-on skills on developing the relational database model, SQL- a relational database language, and other database models.			✓	

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.			Weighting*	Remarks
	1	2	3		
Continuous Assessment: 30%					
AT1: Coursework A group project, which includes a project report and presentation, will be allocated to let students apply the modelling concepts and database programming techniques learnt in class to solve practical problems	✓	✓	✓	30%	
Examination: 70% (duration: one 2-hour exam)					
AT2: Examination A written examination is developed to assess student's competence level of the taught subjects.	✓	✓	✓	70%	
* The weightings should add up to 100%.				100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics
(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

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Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Coursework	Ability to explain the role of database users and features of database systems, and architecture of database systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design a small database application using entity-relationship method and relational database design theory.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Examination	Ability to explain the role of database users and features of database systems, and architecture of database systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels

	Capability to design a small database application using entity-relationship method and relational database design theory.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   - Database environments including the basic concepts, definitions and database approaches. Architectures and components of database systems.
   - Database development process and conceptual database design using Enhanced Entity-Relationship approach.
   - The relational data model and its languages. Three-layer relational database architecture. Business benefits of the relational model.
   - Logical database design concepts, theory and techniques. Normalisation of relations and business considerations in data normalization.
   - Physical database design process and techniques. Designing physical records and de-normalization, file organizations, using and selecting indexes, performance improvements.
   - Database Definitive and Data Manipulation Languages in relational database management systems (RDBMS). Techniques in writing SQL statements. Choice of RDBMS from user perspectives.
   - Advanced topics on SQL, triggers, stored procedures, embedded SQL, dynamic SQL and XML.

2. **Reading List**
2.1 **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi. Modern Database Management, 12th Edition by Pearson. (July 23, 2015).
2.	Elmasri, R. and Navathe, S.B., Fundamentals of Database Systems, The Benjamin/Cummings, Co. Inc., 2009.
3.	Korth, H.F. and Silberschatz, A., 2012, Database System Concepts, McGraw-Hill, Inc.
4.	Date, C.J., An Introduction to Database Systems, Addison Wesley, 2007.
5.	P. Rob and Carols Coronel, Database Systems: Design, Implementation and Management, 7th edition, Course Technology, 2006.
6.	Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi. Modern Database Management, 12th Edition by Pearson. (July 23, 2015).

2.3 **Online Resources**

   Course reading materials will be augmented by articles from journals and by whitepapers and other materials available on-line.

Course Title   :   Big Data & Social Media Analytics

Course Code   :   IS6941

Course Duration   :   One Semester (13 weeks)

No. of Credit Units   :   3

Level   :   P6

Medium of Instruction :   English

Medium of Assessment   :   English

Prerequisites   :   Nil

Precursors   :   Nil

Equivalent Courses   :   Nil

Exclusive Courses   :   Nil

Course Details

1. **Abstract**

    This course aims to develop students' knowledge and skills to apply big data and and social media analytics tools and techniques to enhance various business applications.

2. **Course Intended Learning Outcomes (CILOs)**
    (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the basic concepts and techniques for big data management and online social media analytics.	20%	✓	✓	
2.	Design and apply big data and social media analytics tools and techniques to enhance various business applications.	30%	✓	✓	✓
3.	Critically evaluate various big data and social media analytics technologies with respect to realistic business contexts.	30%		✓	
4.	Work productively as part of a team, and in particular, communicate and present big data and social media analytics solutions effectively in written and oral forms under a collaborative work environment.	20%	✓	✓	
	* If weighting is assigned to CILOs, they should add up to 100%.	100%			

Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

> 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.

3. **Teaching and Learning Activities (TLAs)**
   (TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	**2**	**3**	**4**	
TLA1: Lecture	Concepts and general knowledge of big data and social media analytics tools, techniques and their business applications are illustrated. • *In-class discussion*: Students actively participate in discussions in lectures (e.g. face-to-face discussion, using mobile devices) and the lecturer provides feedback based on students' responses. • *Active Reflection*: At the beginning of every lecture, students are expected to actively reflect and summarize the main topics covered in the previous lecture and lecturer will provide feedback based on students' concerns and questions.	✓	✓	✓		
TLA2: Tutorial, Laboratory and Case studies	The tutorial and laboratory sessions cover the technical aspects of various big data and social media analytics tools and techniques, and their real-world applications. • *Tutorial exercises*: e.g. hands-on activities of utilizing big data management platforms such as Hadoop and Spark; hands-on activities of applying large-scale social network analysis software such as Pajek for social media analytics; hands-on activities of applying various Python-based APIs for online social media data management and analytics, etc. • *Case/Group project discussion*: Students will be given some case studies and a project relating to big data or social media analytics application under a realistic business context. Discussion on various aspects of a case or project for applying big data and social media analytics tools to improve the productivity and efficacy of a business application will be conducted.	✓	✓	✓	✓	
TLA3: On-Line Active Readings and Discussions	Students are encouraged to conduct self-reflection and sharing of concepts, techniques, and methods related to big data and social medial analytics methodologies, and their applications to real-world business contexts.	✓	✓		✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Indicative of likely activities and tasks students will undertake to learn in this course. Final details will be provided to students in their first week of attendance in this course.

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 60%						
AT1: Individual Tutorial Exercises Students need to complete and submit individual tutorial exercises that cover both conceptual exploration and hands-on skills of big data and social media analytics tools and techniques.	✓	✓			10%	
AT2: Team Project There will be a team project associated with the course. The assessment of the team project is based on the understanding of the concepts and techniques related to big data and social media analytics discussed in lectures, and the creativities of applying these tools and techniques to solve a real-world business problem. The project requires a project proposal, prototype system demonstration, and presentation, as well as a final report.	✓	✓	✓	✓	40%	
AT3: Individual Online Reflection and Discussion Exercises Students need to complete and submit individual self-reflection and collaborative discussion reports relted to case studies of applying big data and social media analytics solutions to enhance various business applications.			✓	✓	10%	
Examination: 40% (duration: one 2-hour exam)						
AT4: Examination The final examination of 2 hours will be used to assess students' achievement on intended learning outcomes.	✓		✓		40%	
* The weightings should add up to 100%.					100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Individual Tutorial Exercises	Capability to describe the basic concepts and techniques for big data management and online social media analytics	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to design and apply big data and social media analytics tools and techniques to enhance various business applications.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Team Project	Ability to describe the basic concepts and techniques for big data management and online social media analytics.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to design and apply big data and social media analytics tools and techniques to	High	Significant	Moderate	Basic	Not even reaching

	enhance various business applications.					marginal levels
	Ability to critically evaluate various big data and social media analytics technologies with respect to realistic business context.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to work productively as part of a team, and in particular, communicate and present big data and social media analytics solutions effectively in written and oral forms under a collaborative work environment.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3: Individual Online Reflection and Discussion Exercises	Ability to critically evaluate various big data and social media analytics technologies with respect to realistic business context.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to work productively as part of a team, and in particular, communicate and present big data and social media analytics solutions effectively in written and oral forms under a collaborative work environment.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT4: Final Exam	Ability to describe the basic concepts and techniques for big data management and online social media analytics.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to design and apply big data and social media analytics tools and techniques to enhance various business applications.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to critically evaluate various big data and social media analytics technologies with respect to realistic business context.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to work productively as part of a team, and in particular, communicate and present big data and social media analytics solutions effectively in written and oral forms under a collaborative work environment.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
    (An indication of the key topics of the course.)

    - Online social media services (e.g. YouTube, Twitter, Facebook, GitHub, Pinterest, etc.) and their APIs.

    - Social media analytics tools. Analytics development tools such as Python and social network analytics tools such as Pajek.

    - Scraping and extracting conversational topics on Internet forums using Python.

    - Analyzing social media contents (e.g. tweets) using sentiment analysis and entity recognition tools.

    - Machine learning techniques for social media analytics such as Naïve Bayes classification for social link prediction, the K-Nearest Neighbour (KNN) method for social sentiment analysis, etc.

    - Big data analytics platforms such as Apache Hadoop and Apache Spark. The architecture of Hadoop versus that of Spark. Hadoop Distributed File System (HDFS) versus Resilient Distributed Datasets (RDD). The MapReduce model, constructing mapper and reducer using Scala.

    - NoSQL and distributed SQL query engine.

    - Parallel sentiment analysis with Hadoop and Spark.

2. **Reading List**

2.1 **Compulsory Readings**
    (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Chatterjee, Siddhartha and Krystyanczuk, Michal, Python Social Media Analytics: Analyze and visualize data from Twitter, YouTube, GitHub, and more (1st edition), Packt Publishing, 2017, ISBN: 978-1-78712-148-5.
2.	Nataraj Dasgupta. Practical Big Data Analytics: Hands-on techniques to implement enterprise analytics and machine learning using Hadoop, Spark, NoSQL and R (1st edition), Parkt Publishing, 2018, ISBN: 978-1783554393.

2.2 **Additional Readings**
    (Additional references for students to learn to expand their knowledge about the subject.)

1.	Mohammed Guller. Big Data Analytics with Spark: A Practitioner's Guide to Using Spark for Large Scale Data Analysis (1st edition), Apress, 2015. ISBN-13: 978-1484209653.
2.	Russell Jurney. Agile Data Science 2.0: Building Full-Stack Data Analytics Applications with Spark (1st edition), O'Reilly, 2017. ISBN-13: 978-1491960110.
3.	Ganis, M. and Kohirkar, A., Social Media Analytics: Techniques and Insights for Extracting Business Value Out of Social Media, IBM Press, (1st edition, December, 2015), ISBN-13: 978-0133892567.
4.	Bali, R., Sarkar, D., Sharma, T., Learning Social Media Analytics with R: Transform data from social media platforms into actionable business insights (May 26, 2017), ISBN-13: 978-1787127524.
5.	Jeffrey Aven. Data analytics with spark using Python (1st edition), Addison-Wesley Professional, 2018, ISBN-13: 978-0134846019.

2.3 **Online Resources**

Course reading materials will be augmented by articles from journals and by whitepapers and other materials available on-line. Below are some examples:

Lau, Raymond Y. K., Zhang, W. & Xu, W., Oct 2018, Parallel Aspect: Oriented Sentiment Analysis for Sales Forecasting with Big Data, Production and Operations Management (27:10), pp. 1775-1794.

Lau, Raymond Y. K., Zhao, J. L., Chen, G. & Guo, X., Dec 2016, Big Data Commerce, Information and Management (53:8), pp. 929-933.

Lau, Raymond Y. K., Leon Zhao, J., Zhang, W., Cai, Y. & Ngai, E. W., Jun 2015, Learning context-sensitive domain ontologies from folksonomies: A cognitively motivated, method, INFORMS Journal on Computing (27:3), pp. 561-578.

Du, X., Ye, Y., Lau, R. Y. K. & Li, Y., Apr 2015, OpinionRings: Inferring and visualizing theopionion tendency of socially connected users, Decision Support Systems (75), pp. 11-34.

Fan, S., Lau, R. Y. K. & Zhao, J. L., Mar 2015, Demystifying Big Data Analytics

Course Title	:	Data Mining
Course Code	:	MS6711
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	MS5212 Statistical Methods I or MS5217 Statistical Data Analysis
Equivalent Courses	:	Nil
Exclusive Courses	:	FB6711 Data Mining

Course Details

1. **Abstract**

The course aims to provide an introduction to discover hidden information from business data using data mining techniques with the aid of SAS Enterprise Miner software.

2. **Course Intended Learning Outcomes (CILOs)**
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Demonstrate knowledge of data mining concepts and algorithms.	30%	✓	✓	✓
2.	Define and formulate real-world data mining problems.	10%	✓	✓	✓
3.	Explore and prepare the data for data mining projects.	10%	✓	✓	✓
4.	Evaluate critically the appropriateness of the extracted information.	10%	✓	✓	✓
5.	Extract and analyze information from data with the use of SAS Enterprise Miner software.	40%	✓	✓	✓
*If weighting is assigned to CILOs, they should add up to 100%.		100%			

* If weighting is assigned to CILOs, they should add up to 100%.
[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lecture	Lecturer explains and discusses the concepts, algorithms, of data mining and how to evaluate the quality of the extracted information.	✓	✓	✓	✓		
In-class activities	Lecturer will demonstrate the use of SAS Enterprise Miner software in class on selected topics. Students are required to work individually or as a group on simulated or small real data using the software. Through these in-class exercises, the lecturer can identify the common problems that students have and give more elaboration as needed. Students can also identify the kinds of mistakes that they have made and learn how to correct them.	✓		✓	✓	✓	
Out-of-class assignments	Running the data mining algorithms on large data set is a very time consuming process. It is not possible to do it regularly in class. Students tackle focused problems based on large business data as out-of-class assignments. Students may work in small groups for these assignments so that they can discuss the problems and come up a solution together.	✓		✓	✓	✓	
Project	The ultimate aim of the course is to rovide students with the specialist knowledge and training to run a business data mining task. Students are given a large data set with described business problem. They are asked to extract useful information related to the set of identified data mining goals for the problem. This is likely to be a semester-long activity. Students need to make use of everything they have learned in this course in order to achieve the goals. They are encouraged to form small groups for the project so that they can analyze the data and run the software together. They can always seek help and advice from the lecturer during the semester.	✓	✓	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: 60%							
Assignment	✓	✓	✓	✓	✓	10%	
Project	✓	✓	✓	✓	✓	50%	
Examination: 40% (duration: 3 hours, if applicable)							
Examination	✓	✓	✓	✓	✓	40%	
						100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
Assignments, Project, Examination	Scores shall be awarded for each assignment, project and examination.	Excellent achievement in all aspects of CILOs, including good knowledge in data mining concepts, knowing how to prepare, utilising SAS Enterprise Miner software, selecting appropriate data mining tools, judging the quality of the results, and presenting the results effectively.	Good achievement in most aspects of CILOs, including good knowledge in data mining concepts, knowing how to prepare, utilising SAS Enterprise Miner software, selecting appropriate data mining tools, judging the quality of the results, and presenting the results effectively	Excellent achievement in all aspects of CILOs, including good knowledge in data mining concepts, knowing how to prepare, utilising SAS Enterprise Miner software, selecting appropriate data mining tools, judging the quality of the results, and presenting the results effectively.	Satisfactory achievement in some aspects of CILOs, but have serious weakness in one or more aspects of the CILOs.	Failed to achieve most of the CILOs.

Other Information

1. Keyword Syllabus

(An indication of the key topics of the course.)

Introduction to data mining
What is data mining? Why use data mining? How do you mine data? Data mining terminology.

Data Mining Process
Defining a study; Data preparation; Data cleansing; Building a model.

Data Mining Tools and Technologies
Decision trees; Neural network; Clustering analysis; Association rules; Logistic Regression models.

Case Studies
Applications in banking and finance, retail, telecommunications, and financial market.

Data Mining Software
SAS Enterprise Miner Software

2. Reading List

2.1 Compulsory Readings
(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

Nil

2.2 Additional Readings
(Additional references for students to learn to expand their knowledge about the subject.)

1.	Getting Started with SAS Enterprise Miner 14.2, SAS Pub, 2016.
2.	DATA MINING techniques with SAS ENTERPRISE MINER. Sampling, Exploratory Analysis and Association Rules, Scientific Books, CreateSpace Independent Publishing Platform 2015.
3.	Data Mining Techniques Predictive Models with SAS Enterprise Miner, Scientific Books.
4.	CreateSpace Independent Publishing Platform 2015.
5.	Regression Models and Decision Trees with SAS ENTERPRISE MINER, Scientific Books, CreateSpace Independent Publishing Platform 2015.
6.	Data Mining Techniques, Segmentation with SAS Enterprise Miner, Scientific Books, CreateSpace Independent Publishing Platform 2015.
7.	Predictive modeling with SAS Enterprise Miner: Practical Solution for Business Applications, second edition, Kattamuri S. Sarma, SAS Institute, 2013.
8.	Data mining techniques: For marketing, sales, and customer support, Michael Berry & Linoff, 3nd Edition, John Wiley & Sons, 2011. (Small quantity of copies is available at the campus bookshop.).
9.	Data Mining and Analysis, Mohammed J. Zaki , Wagner Meira Jr. Cambridge University Press, 2014
10.	Principles of Data Mining, Max Bramer, 2nd Edition, Springer, 2013. (Small quantity of copies is available at the campus bookshop.)
11.	Data Mining for Business Analytics: Concepts, Techniques, and Applications in Microsoft Excel with XLMiner, 3rd Edition, Galit Shmueli, Nitin Patel, Peter Bruce, Wiley, 2016.
12.	Introduction to Data Mining with Case Studies, 2nd Edition, G K Gupta, Prentice-Hall of India Pvt. Ltd, 2011.
13.	Handbook of Statistical Analysis and Data Mining Applications, Robert Nisbet, John Elder, Gary Miner, Academic Press, 2009.
14.	Practical Applications of Data Mining, 1st edition, Sang C. Suh, Jones & Bartlett Learning, 2012.
15.	Data Mining and Statistics for Decision Making, Stéphane Tufféry, Wiley, 2011.
16.	Data mining: Concepts and techniques, Jiawei Han, Micheline Kamber, & Jian Pei, 3rd Edition, Morgan Kaufmann Pub, 2011.
17.	A Practical Guide to Data Mining for Business and Industry: Case Studies and Methodology, Andrea Ahlemeyer-Stubbe, Shirley Coleman, Wiley, 2014.
18.	Discovering Knowledge in Data: An Introduction to Data Mining, Daniel T. Larose, Chantal D. Larose, 2nd edition, Wiley, 2014
19.	Data Mining: Concepts, Models, Methods, and Algorithms, Mehmed Kantardzic, 2nd edition, Wiley, 2011.

Course Title	:	Management Support and Business Intelligence Systems
Course Code	:	IS5740
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**

   This elective course aims to introduce emerging as well as popular analytical concepts and information technologies suitable for management support with business intelligence.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Recognize the need for management support and business intelligence requirements beyond typical Management Information Systems.	20%	✓		
2.	Acquire and critically apply analytical concepts and skills of management support and business intelligence.	30%	✓		
3.	Differentiate between various information technologies for management support and business intelligence that enable quantitative and non-quantitative analysis.	20%	✓	✓	
4.	Formulate and critically analyze the requirements for management support, and identify appropriate tools and techniques required for implementation of business intelligence systems.	10%	✓	✓	
5.	Creatively develop effective solutions to real management support and business intelligence problems.	20%	✓	✓	✓
		100%			

* If weighting is assigned to CILOs, they should add up to 100%.
 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)**
   (TLAs designed to facilitate students' achievement of the CILOs.)

   Seminar   :   26 hours
   Laboratory   :   13 hours

| TLA | Brief Description | CILO No. | | | | | Hours/week |
		1	2	3	4	5	(if applicable)
TLA1: Seminar	Concepts and applications of information technology in the context of decision making and problem solving for Management support are explained by instructor. Exercises and case studies also are introduced to students for interactive learning in the seminars.	✓	✓	✓			
TLA2: Demonstration	Demonstrations of representative technologies and their application to address business problems are given. Course participants critically analyze requirements for management support, and identify appropriate tools and techniques required.		✓	✓	✓	✓	
TLA3: Practical	Development of hands-on skills for solving real-life business problems analytically and with appropriate technologies of management support and business intelligence is carried out.		✓	✓	✓	✓	
TLA4: Case Analysis	Students will be required to relate to the content of their own workplace or other relevant organizational environment, the relevance of the various business intelligence and management support solutions. Results will be discussed and presented to fellow students.	✓		✓	✓		
TLA5: On-Line Discussion	Students will use online media such as discussion forums, weblogs, or wikis to self-reflect on their learning and share their insights with classmates.	✓	✓	✓	✓	✓	

4. **Assessment Tasks/Activities (ATs)**
   (ATs are designed to assess how well the students achieve the CILOs.)

| Assessment Tasks/Activities | CILO No. | | | | | Weighting* | Remarks |
	1	2	3	4	5		
Continuous Assessment: 60%							
AT1. Seminar, Laboratory Exercises, Participation, and Online Discussion Each seminar and laboratory consists of exercises, small group discussions, self-reflection, or student presentations to assess students' understanding of the chosen topics and their abilities to apply their skills. It also includes online comments with which students report key learning, self-reflection, and related concepts found online.	✓	✓	✓	✓		20%	

Assessment Task							Weighting	
AT2. Individual Assignment An individual assignment which lets students analyze a business problem and develop an analytical of implemented solution.				✓	✓	✓	10%	
AT3. Group Project A group project, which includes a project report and presentation, will be allocated to let students apply Management Support and Business Intelligence concepts and technologies to solve business problems.	✓	✓	✓	✓	✓		30%	
Examination: 40% (duration: one 2-hour exam)								
AT4. Examination A written examination is developed to assess student's competence level of the taught subjects.	✓	✓	✓	✓			40%	
The weightings should add up to 100%.							100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. **Assessment Rubrics**

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1. Seminar, Laboratory Exercises, Participation, and Online Discussion	Ability to accurately describe key concepts of management support and business intelligence and differentiate against typical management information system; and explain the need for management support and business intelligence requirements beyond typical Management Information Systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to explain how the analytics underlying management support and business intelligence generate better business information and help solve business problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to differentiate between various information technologies for management support and business intelligence that enable quantitative and non-quantitative analysis; and compare and contrast technology characteristics and corresponding capabilities.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to formulate and critically analyze the requirements for management support, and identify appropriate tools and techniques required for implementation of business intelligence systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2. Individual Assignment	Ability to differentiate between various information technologies for management support and business intelligence that enable quantitative and non-quantitative analysis; and compare and contrast	High	Significant	Moderate	Basic	Not even reaching marginal levels

	technology characteristics and corresponding capabilities.					
	Capability to formulate and critically analyze the requirements for management support, and identify appropriate tools and techniques required for implementation of business intelligence systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to creatively develop effective solutions to real management support and business intelligence problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3. Group Project	Ability to accurately describe key concepts of management support and business intelligence and differentiate against typical management information system; and explain the need for management support and business intelligence requirements beyond typical Management Information Systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to explain how the analytics underlying management support and business intelligence generate better business information and help solve business problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to differentiate between various information technologies for management support and business intelligence that enable quantitative and non-quantitative analysis; and compare and contrast technology characteristics and corresponding capabilities.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to formulate and critically analyze the requirements for management support, identify appropriate tools and techniques required for implementation of business intelligence systems, and conduct in-depth analysis.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to creatively develop effective solutions to real management support and business intelligence problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT4. Examination	Ability to accurately describe key concepts of management support and business intelligence and differentiate against typical management information system; and explain the need for management support and business intelligence requirements beyond typical Management Information Systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels

		High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to explain how the analytics underlying management support and business intelligence generate better business information and help solve business problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to differentiate between various information technologies for management support and business intelligence that enable quantitative and non-quantitative analysis; and compare and contrast technology characteristics and corresponding capabilities.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to formulate and critically analyze the requirements for management support, identify appropriate tools and techniques required for implementation of business intelligence systems, and conduct required analysis.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   1. Introduction to Management Support and Business Intelligence Systems – managerial decision making; role of decision support systems, expert systems, online analytic processing, data warehouses, data mining, and related technologies in decision making; developing business intelligence strategies and execution plans.
   2. Principles of decision making and problem solving: intelligence-design-choice; decision making under uncertainty; multi-attribute decision making; optimization, satisficing; goal seeking; simulation.
   3. Traditional management support technologies and their Web-based extensions – DSS, Group DSS, Organizational DSS, Expert Systems, Executive Information Systems.
   4. Data warehousing, data mining and data visualization - Data warehouses and data marts, OLAP, data visualization and multidimensionality, intelligent databases and data mining.
   5. Non-quantitative methods and technologies for management support and business intelligence – knowledge management, neural computing, intelligent agents and hybrid intelligent systems.

2. **Reading List**
2.1 **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Galit Shmueli, Nitin Patel and Peter Bruce, Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner, 2nd edition, Wiley. ISBN-10: 0470526823, ISBN-13: 978-0470526828

Course Title	:	Blockchain Technology and Business Applications
Course Code	:	IS6200
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**

   The course will cover blockchain technologies, distributed ledger technology, cryptocurrencies (e.g., Bitcoin), and their applications, implementation and security concerns. Students will learn how these systems work; analyse the security and regulation issues relating to blockchain technologies; and understand the impact of blockchain technologies on financial services and other industries.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Explain the concepts of cryptocurrency, blockchain, and distributed ledger technologies	20%			
2.	Analyse the application and impact of blockchain technology in the financial industry and other industries	30%	✓	✓	
3.	Evaluate security issues relating to blockchain and cryptocurrency	25%	✓	✓	
4.	Design and analyse the impact of blockchain technology in other markets	25%			
* If weighting is assigned to CILOs, they should add up to 100%.		100%			

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No. 1	2	3	4	Hours/week (if applicable)
TLA1: Lecture	Concepts, frameworks, and technologies of blockchain and cryptocurrency are explained.	✓		✓		
TLA2: Cases studies	Students are required to analyse how blockchain technology be used in different industries and evaluate its impact on businesses.	✓	✓	✓	✓	
TLA 3: Online discussion	It is a means of self-reflection and sharing concepts, techniques, and methods of knowledge management among students within or after formal classes.	✓	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No. 1	2	3	4	Weighting*	Remarks
Continuous Assessment: 60%						
AT1: Participation Students should participate in class activities, such as small group discussions and presentations, self-reflection, raise and answer questions, and the like. Class participation is used to assess students' understanding of the topics and their abilities to apply the knowledge and concepts taught in class.	✓	✓	✓	✓	10%	
AT2: Individual Assignments Students will answer questions and solve problems in the area of blockchain technologies and applications.	✓	✓	✓	✓	20%	
AT3: Group Project A group project is developed to allow students to apply the concepts and tools learned in the course via hands-on experiences. A project report with two parts, project plan (10%) and project outcome (20%), will be required to illustrate the achievements of the group project that develops blockchain technologies and/or applications.	✓	✓	✓	✓	30%	
Examination: 40% (duration: one 2-hour exam)						
AT4: Examination A 2-hour exam will be given to assess the capability of the students in terms of conceptual understanding and analytical skills in blockchain-related subjects that have been covered in the course through lectures, readings, and exercises.	✓	✓	✓	✓	40%	
The weightings should add up to 100%.					100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Participation	Ability to accurately analyze a given blockchain technology and business application and recommend relevant improvements with justification.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Individual Assignments	Capability to accurately apply a blockchain framework and a method to develop all the relevant artifacts at different modeling levels.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3: Group Project	Ability to accurately identify and assess all the relevant governance and management issues in implementing blockchain solutions to an organization.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT4: Examination	Capability to analyse and propose innovative and feasible blockchain solutions by making use of emerging technologies to support an organizational information sharing strategies.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information

1. Keyword Syllabus
(An indication of the key topics of the course.)

Blockchain technology, data blocks, internet of money, cryptocurrency, bitcoin, decentralization, peer-to-peer network, distributed ledger, security, privacy regulation, banking, financial services, applications in businesses, new business models, entrepreneurship

2. Reading List
2.1 Compulsory Readings
(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Tiana Laurence, IBM – Blockchain for Dummies (240 pages), 01 May 2017, John Wiley & Sons Inc., New York, United States
2.	Joseph J. Bambara and Paul R. Allen, Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions (302 pages), 2018, McGraw Hill Education.

2.2 Additional Readings

Additional references for students to expand their knowledge about the subject will be distributed in class.

2.3 Online Resources
Readings will be augmented by pertinent journal/newspaper/magazine articles.

Course Title	:	Business Intelligence Applications
Course Code	:	IS6321
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**

This course aims to develop students' knowledge and skills to carry out real-world business intelligence tasks professionally by emphasising the use of analytics tools and the management of these tools.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the basic concepts of business intelligence and analytics to support business operations and effectively use emerging technologies for business purposes.	20%			
2.	Design and apply the analytical techniques and technologies of business intelligence and analytics to find solutions for local and international business problems.	30%	✓	✓	
3.	Manage analytical tools and big data for effective and efficient discovery of business intelligence in a technology-driven economy.	35%	✓	✓	✓
4.	Demonstrate good communication and interpersonal skills in proposing and presenting appropriate strategies for business intelligence.	15%			
	* If weighting is assigned to CILOs, they should add up to 100%.	100%			

[#] *Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.*

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

Seminar : 3 hours per week (preferably to be conducted in computer lab)

TLA	Brief Description	CILO No. 1	2	3	4	Hours/week (if applicable)
TLA1. Lecture	Concepts of business operation support and intelligence and its web-based extensions to solve business problems, and the design, implementation, integration, and management of business intelligence systems for real-world business applications are explained by instructor.	✓	✓	✓		
TLA2. Case Studies	The business intelligence-related problems and the specific applications of proven problem solving techniques as well as cutting-edge technologies for business support and intelligence concepts are discussed and presented to the fellow students.	✓	✓	✓	✓	
TLA3. Demonstrations and hands-on exercises	Demonstrations and practices of application of business data analytical techniques to business problems.		✓	✓	✓	
TLA4. Practical	Developing the hands-on skills for solving business problems by adopting the business intelligence skills just taught.		✓	✓	✓	
TLA5. On-Line Discussion	It is a means of self reflection and sharing concepts, techniques, and methods for business intelligence issues among students within or after formal classes.	✓	✓		✓	

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No. 1	2	3	4	Weighting*	Remarks
Continuous Assessment: 60%						
AT1. Seminar Participation and Exercises Each seminar consists of lecture, exercises, small group discussions, self reflection, or student presentations to assess students' understanding of the chosen topics and their abilities to apply their skills.	✓	✓	✓		20%	
AT2. Group Project A group project, which includes a project report and presentation, will be allocated to let students practise on the skills acquired.		✓	✓	✓	40%	
Examination: 40% (duration: one 2-hour exam)						
AT3. Examination A written examination is developed to assess student's competence level of the taught subjects.	✓	✓	✓		40%	
The weightings should add up to 100%.					100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics
(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1. Seminar Participation and Exercises	Ability to accurately and profoundly describe all important requirements and all key concepts for business intelligence and analytics; effectively compare and discriminate among the key concepts;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to reasonably and effectively formulate and discriminate the business intelligence analytical techniques and technologies to solve given business problems;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to effectively and accurately propose a comprehensive management plan and methodology on how intelligence data could be collected and analyzed to improve the outcomes of the business initiatives;	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2. Group Project	Capability to reasonably and effectively formulate and discriminate the business intelligence analytical techniques and technologies to solve given business problems;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to effectively and accurately propose a comprehensive management plan and methodology on how intelligence data could be collected and analyzed to improve the outcomes of the business initiatives;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to show well-rounded knowledge in identifying most appropriate existing technique for respective system design and implementation problems;	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3. Examination	Ability to accurately and profoundly describe all important requirements and all key concepts for business intelligence and analytics; effectively compare and discriminate among the key concepts;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to reasonably and effectively formulate and discriminate the business intelligence analytical techniques and technologies to solve given business problems;	High	Significant	Moderate	Basic	Not even reaching marginal levels

	Capability to effectively and accurately propose a comprehensive management plan and methodology on how intelligence data could be collected and analyzed to improve the outcomes of the business initiatives;	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

Introduction to Business Intelligence
- What is business intelligence and analytics, and how to apply and manage analytics tools to achieve desirable business outcomes?

Business Intelligence Data Analytics
- How can we collect business big data for analysis purposes?
- What are analytics for web, finance, marketing, mobile and social, and how are they applied?
- How to identify business intelligence metrics and how to measure them?

Emerging Trends and Concerns of Business Intelligence
- How have these technologies been enlarged by the various online and offline platforms?
- What are the cutting-edge technologies for business support and applications?

2. **Reading List**
2.1 **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Andrew W. Lo, Hedge Funds: An Analytic Perspective, Princeton University Press, 2010.
2.	Arvind Sathi, Big Data Analytics: Disruptive Technologies for Changing the Game, Mc Press, 2013.
3.	Avinash Kaushik, Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity, Sybex, 2009.
4.	Ben Waber, People Analytics, FT Press, 2013.
5.	Eric Siegel, Predictive Analytics, Wiley, 2013.
6.	Kim Dushinski, The Mobile Marketing Handbook, 2/e, Information Today, Inc., 2012.
7.	Paul W. Farris, Neil T. Bendle, Philip E. Pfeifer and David J. Reibstein, Marketing Metrics – The Definitive Guide to Measuring Marketing Performance, 1/e Wharton School Publishing, 2010.
8.	Thomas H. Davenport, Enterprise Analytics: Optimize Performance, Process, and Decisions Through Big Data, FT Press, 2012.
9.	Tim Ash, Rich Page and Maura Ginty, Landing Page Optimization – The Definitive Guide to Testing and Tuning for Conversions, 1/e, Sybex, 2012.
10.	Victoria Lemieux, Financial Analysis and Risk Management: Data Governance, Analytics and Life Cycle Management, Springer, 2012.

2.3 **Online Resources**

Course reading materials will be augmented by articles from journals, whitepapers and other materials available on-line.

Course Title	:	Business Data Analytics
Course Code	:	IS6400
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Basic knowledge on statistics
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**

The course aims to teach students the process, models, and tools for data analysis and analytics in business, such as in finance, marketing, etc. The course will teach students the practical skills to employ software packages (such as spreadsheets and statistics software) and apply necessary extensions (such as with add-in tools, macros, scripts, queries, etc.) to analytical framework and tackle business data analysis problems for corporation manage and decision making. On completion of the course students should be able to
   (a) understand the target and requirements of a selection of critical business data analysis problems;
   (b) manage the statistical techniques/models for data analytics;
   (c) implement the models into a software packages, such as spreadsheet, and adapt the models through add-ins and scripting/programming capabilities (such as using macro and VBA); and
   (d) analyze and interpret the outputs of models to support decision making in finance, marketing, accounting, etc.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the target and requirements for a spectrum of business data analysis problems in finance, marketing, etc.	25%	✓		
2.	Develop the ability to employ scripting and database tools to retrieve data and use spreadsheet and statistical software to discover patterns in data to address the selected problems.	35%	✓	✓	
3.	Creatively apply and adapt the introduced modeling techniques to propose original findings for practical organizational data analysis problems.	30%		✓	✓
4.	Creatively communicate analytical procedure and results effectively in presentations with oral, written and electronic formats.	10%		✓	✓
* If weighting is assigned to CILOs, they should add up to 100%.		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)**
   (TLAs designed to facilitate students' achievement of the CILOs.)

Indicative of likely activities and tasks students will undertake to learn in this course. Final details will be provided to students in their first week of attendance in this course.

Lecture   :   13 hours
Laboratory/Tutorial :   26 hours

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
TLA1. Lecture	Explain the concepts, applications, and implications of a selection of business data analysis problems in finance, marketing, and so forth. Formulate the problems and Introduce statistics models and data analytics techniques to address them.	✓	✓	✓		
TLA2. Laboratory	Demonstrations by instructor and hands-on exercises by students on solving the selected business data analysis problems in finance, marketing, etc. Widely used commercial software, such as Microsoft Excel, will be used as a means to practice the modelling techniques learnt in lectures.	✓	✓	✓	✓	
TLA3. Group Project	Students would have to complete a group project to investigate a real life case in finance, marketing, or other area and apply business data analytics techniques to address it.	✓	✓	✓	✓	

4. **Assessment Tasks/Activities (ATs)**
   (ATs are designed to assess how well the students achieve the CILOs.)

Indicative of likely activities and tasks students will undertake to learn in this course. Final details will be provided to students in their first week of attendance in this course.

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 60%						
AT1. Class performance and assignments Involvement in class discussions reflect on the materials covered in the lecture; Attempt in laboratory exercises; and Efforts shown in addressing the data analysis assignments provided by the instructor.	✓	✓	✓	✓	30%	
AT2. Group Project A group project, which includes a written report and an oral presentation (about 10 min duration), will be assigned to students to investigate a real-life problem in business data analysis to critically apply the concepts learned in the course, and propose original findings. Each team will contain 4 to 6 students.	✓	✓	✓	✓	30%	

Examination: 40% (duration: one 2-hour exam)				

AT3. Final Examination The final exam is used to assess the student's competence in the taught subjects and will cover the readings assigned in class as well as the lectures, tutorials, and cases and examples mentioned in class.	✓	✓	✓		40%	
The weightings should add up to 100%.					100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics
(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Class performance and assignments	Ability to show initiative and interactions in raising sensible questions and giving insightful discussion of issues relating to the course topics in class.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to demonstrate understanding of the course topics through assignments.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Group Project	Ability to frame the problem to the models learned in the class and push the ability of the model to a high level in tackling the problem.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to contribute to the project and deal with issues in collaboration.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3: Exam	Ability to provide good answers to exam questions.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus
(An indication of the key topics of the course.)

- Introduction and Overview
  - Data analysis in finance, marketing, and other business applications
  - Business intelligence
  - Spreadsheet modeling and Excel functions
  - SQL and statistics
- Techniques
  - Chart and analytics
  - Regression
  - VBA programming
  - Data collection, cleansing, normalization, & mining
- Applications
  - Financial statement analysis: Ratios and predictions
  - Financial forecasting: Sales, revenue, and stock
  - Business intelligence in marketing: Census, segmentation & basket analysis
- Advanced topics
  - Visualization

- o   Time series analysis
- o   Risk assessment & portfolio management
- o   Survival and factor analysis

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	S. Christian Albright, and Wayne Winston, Business Analytics: Data Analysis and Decision Making, 5th edition, Cengage Learning, 2015.
2.	Gordon S. Linoff, Data Analysis Using SQL and Excel, Wiley Pub., 2nd edition, 2015.
3.	Viktor Mayer-Schönberger, Kenneth Cukier, Big Data: A Revolution That Will Transform How We Live, Work, and Think, Eamon Dolan/Houghton Mifflin Harcourt, 2013.
4.	John W. Foreman, Data Smart: Using Data Science to Transform Information into Insight, Wiley Pub, 2013.
5.	Timothy R. Mayes and Todd M. Shank, Financial Analysis with Microsoft Excel, South-Western College Pub, 2006.
6.	Jackson, M. and Staunton, M., Advanced Modeling in Finance Using Excel and VBA, Wiley Pub.
7.	Simon Benninga, Financial Modeling, MIT Press.

Course Title	:	Innovation and Technology Entrepreneurship
Course Code	:	IS5940
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**
   (A 150-word description about the course)

   This course aims to:

   • Develop students' knowledge and skills to identify business opportunities, gather resources such as talent and capital, and manage growth and technology risks for technology-intensive businesses competing online and offline, in new markets, and in entering potential markets.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the key concepts and characteristics of innovation and technology entrepreneurship.	20%			
2.	Develop an innovative business plan that takes into account socio-technical, economic, and regulatory factors.	30%	✓	✓	✓
3.	Apply appropriate business and revenue models to launch a technology venture successfully.	20%			
4.	Demonstrate creative problem solving skills in formulating successful business strategies.	20%	✓	✓	
5.	Exercise good communication and interpersonal skills in proposing and presenting appropriate business plans.	10%			

* If weighting is assigned to CILOs, they should add up to 100%.   100%
 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)**
   (TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.					Hours/week
		1	2	3	4	5	(if applicable)
TLA1 Lectures	Concepts, methods and case studies of innovation and technology entrepreneurship will be presented.	✓	✓				
TLA2 Tutorials	Individual and group exercises will be given to students to improve their understanding of basic concepts and to develop their skills in formulating innovative business strategies.		✓	✓	✓		
TLA3 Practical Workshops	Developing the hands-on skills for the development of sound business plans and for the communication of these plans to fellow students.		✓	✓	✓	✓	
TLA4 On-Line Discussion:	Students are encouraged to do self-reflection and sharing concepts, techniques, and methods in the formulation of successful business plans and strategies.	✓		✓		✓	

4. **Assessment Tasks/Activities (ATs)**
   (ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: 60%							
AT1 Tutorial Exercises Each tutorial consists of exercises, small group discussions, self-reflection, or student presentations to assess students' understanding of the chosen topics.	✓	✓			✓	30%	
AT2 Group Project A group project, which includes a project report and presentation, will be allocated to let students apply business planning and evaluation skills to develop business plans for technology ventures.	✓	✓	✓	✓	✓	30%	
Examination: 40% (duration: one 2-hour exam)							
AT3 Examination The final examination will be an open book exam to assess student's competence level of the taught subjects. It will cover all readings assigned in the class, the lectures and the tutorials including the cases and examples mentioned in the class.	✓	✓	✓	✓		40%	
The weightings should add up to 100%.						100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1 Tutorial Exercises	Ability to describe the key concepts and characteristics of innovation and technology entrepreneurship.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to analyse the technology and/or business innovations involved in different business cases.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to exercise good communication and interpersonal skills in proposing and presenting appropriate business strategies.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2 Group Project	Ability to describe the key concepts and characteristics of innovation and technology entrepreneurship.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to collaboratively develop an innovative business plan that takes into account socio-technical, economic, and regulatory factors.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to apply appropriate business and revenue models to launch a technology venture successfully.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to demonstrate creative problem solving skills in formulating successful business strategies.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to exercise good communication and interpersonal skills in proposing and presenting appropriate business plans.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3 Examination	Ability to describe the key concepts and characteristics of innovation and technology entrepreneurship.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to apply appropriate business and revenue models for different technology ventures.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to demonstrate creative problem solving skills in formulating successful business strategies.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
    (An indication of the key topics of the course.)

    - CONCEPTS of innovation and technology entrepreneurship.
    - LEGAL, TECHNOLOGICAL, ETHICAL and TAX ISSUES related to entrepreneurship. PRODUCT/SERVICE FEASIBILITY. REVENUE MODEL developed.
    - Improve business efficiency.
    - Advantages and difficulties of MARKETING on the WEB.
    - INTELLECTUAL PROPERTY be effectively PROTECTED.
    - OPPORTUNITIES for VENTURES be realized and used.
    - BUSINESS VENTURE FORMED and PLANNED.
    - Creation of a BUSINESS PLAN improve performance.

2. **Reading List**
2.1   **Compulsory Readings**
    (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2   **Additional Readings**
    (Additional references for students to learn to expand their knowledge about the subject.)

1.	Raphael Amit and Christoph Zott, Business Model Innovation Strategy, John Wiley & Sons, Ltd, 2021. ISBN-13-978-1119689683.
2.	Thomas Byers, Richard Dorf and Andrew Nelson, Technology Ventures: From Idea to Enterprise, McGraw-Hill, 5/e, 2018. ISBN-13: 978-1259875991.
3.	John Bessant and Joe Tidd, Innovation and Entrepreneurship, John Wiley & Sons, Ltd., 3/e, 20151. ISBN-13: 978-1-118-99309-5.
4.	Melissa A. Schilling, Strategic Management of Technological Innovation, McGraw-Hill, 4/e, Oct. 30, 2012. ISBN-13: 978-0078029233.
5.	Alexander Osterwalder, Yves Pigneur. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley and Sons; 1st edition, 2010.
6.	Thomas N. Duening, Robert A. Hisrich, Michael A. Lechter, Technology Entrepreneurship: Creating, Capturing, and Protecting Value.

2.3   **Online Resources**

Course reading materials will be augmented by articles from journals and by whitepapers and other materials available on-line.

Course Title	:	Project Management and Quality Assurance
Course Code	:	IS5540
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P5
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	IS5540M Project Management and Quality Assurance
Exclusive Courses	:	Nil

Course Details

1. **Abstract**
   (A 150-word description about the course)

   This course aims to:

   - Introduce the concepts, methods and procedures and best practices for information systems project management.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the basics of what project management is, the organization and technology context of information systems projects.	25%			
2.	Discover and elaborate the tools and techniques used in various aspects of project management including management of project scope, time, cost, quality, risk and human resources.	30%	✓	✓	
3.	Apply the project management knowledge, skills, tools and techniques learnt to project activities of an IT/IS-related project to meet project requirements.	35%	✓	✓	
4.	Apply a project management software (E.g. MS Project) to help plan and manage a small IT/IS project.	10%			
* If weighting is assigned to CILOs, they should add up to 100%.		100%			

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

Indicative of likely activities and tasks students will undertake to learn in this course. Final details will be provided to students in their first week of attendance in this course.

Seminar	:	2 hours per week
Tutorial	:	1 hour per week

TLA	Brief Description	CILO No. 1	2	3	4	Hours/week (if applicable)
TLA1 Lecture/ Seminar	Concepts on project management, especially the management of IT/IS projects, and the skills and techniques required for a project manager are explained by the instructor.	✓	✓	✓		
TLA2 Demonstrations	How the project management skills and techniques and how a project management software can be used are demonstrated.		✓	✓	✓	
TLA3 Practical Workshop	Hands-on skills on applying the theories, skills and techniques taught in lectures will be practiced by students in workshops.		✓	✓	✓	
TLA4 Case Studies	Real-life cases are used to help the students appreciate the importance of proper project management best practices on IT/IS projects.	✓	✓	✓		
TLA5 Discussions	This allows students to do reflections, raise questions and discuss among themselves on lecture and tutorial materials.	✓	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Indicative of likely activities and tasks students will undertake to learn in this course. Final details will be provided to students in their first week of attendance in this course.

Assessment Tasks/Activities	CILO No. 1	2	3	4	Weighting*	Remarks
Continuous Assessment: 60%						
AT1. Class and Tutorial Participation This will reflect the students' participation in classes, tutorial sessions and on-line discussions. Students are encouraged to attend those sessions and actively participate in discussions. This is an individual mark.	✓	✓	✓	✓	10%	
AT2. Class Assignments This includes in-class assignments, quizzes or take-home assignments.	✓	✓	✓		20%	
AT3. Group Project This is a group project to let students apply the project management skills and techniques learnt in class to solve practical problems. The project includes the following components: • A final group report which is a project plan for executing the IT/IS project. • A final project presentation.	✓	✓	✓	✓	30%	
Examination: 40% (duration: one 2-hour exam)						
AT4. Examination	✓	✓	✓		40%	

A two-hour written examination is developed to assess students' competence level of the taught subjects.						
* The weightings should add up to 100%.					100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
Class and Tutorial Participation (AT1)	CILO1-4 • Ability to actively participate in class and tutorial sessions and on-line discussions • Achievement of attendance	High	Significant	Moderate	Basic	Not even reaching marginal levels
Class Assignments (AT2)	CILO1 – 3 Ability to demonstrate an in-depth understanding on what project management is and its associated skills and techniques and be able to apply them to real-life cases	High	Significant	Moderate	Basic	Not even reaching marginal levels
Group Project (AT3)	CILO1-4 (based on interim and final report) • Ability to demonstrate good understanding of the basic project management concepts • Ability to demonstrate an in-depth thought and research has been made in applying the skills and techniques learnt in class to the project • The report has covered all the specified requirements • The report is well-structured, well-written and well presented • Peer evaluation report reflects at least an average contribution ratio	High	Significant	Moderate	Basic	Not even reaching marginal levels
	CILO2 & 3 (based on group presentation) • Ability to demonstrate collaboratively that the presentation is well-structured and presented in a logical sequence. Time control is good. PowerPoint slides are of high quality • Ability to demonstrate collaboratively the team is able to tackle all/most of the questions raised	High	Significant	Moderate	Basic	Not even reaching marginal levels

	CILO1 - 3
	(based on individual
	performance in presentation)
	• Ability to demonstrate
	  excellent presentation
	  skills and language skills
	• Ability to demonstrate an
	  appropriate use of visual
	  aids in presentation
		High	Significant	Moderate	Basic	Not even
						reaching
						marginal
						levels

Examination (AT4)	CILO1 Capability to evidence good understanding of the importance of good project management to an IT/IS project	High	Significant	Moderate	Basic	Not even reaching marginal levels
	CILO2 Ability to accurately describe all/most key concepts; and demonstrate a thorough understanding of all/most of the terms and techniques	High	Significant	Moderate	Basic	Not even reaching marginal levels
	CILO3 Ability to demonstrate the ability to apply all/most of the skills and techniques learnt to the management of IT/IS projects	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
    (An indication of the key topics of the course.)

    Project Management Basics. Project Integration Management. Project Scope Management. Project Time Management. Project Cost Management. Project Quality Management. Project Human Resource Management. Project Communications Management. Project Risk Management. Real-life Project Management.

    Details:
    *   Introduction to information systems project management, roles of the project manager, organisation and technology context of information systems projects, project life cycle, project management processes and knowledge areas

    *   Strategic planning and project selection, project execution, monitoring and controlling project work, project closing

    *   Scope planning, project scope statement, creating the work breakdown structure, scope verification and control

    *   Activity definition, sequencing, resource and duration estimating, schedule development and control

    *   Cost estimating, cost budgeting and cost control using earned value techniques

    *   Quality planning, quality assurance, quality control, tools and techniques used in quality assurance and quality control

    *   Motivation theories, human resource planning, acquiring the project team, developing the project team, managing the project team

    *   Communications planning, information distribution, performance reporting, managing stakeholders

    *   Risk identification, qualitative and quantitative risk analysis, risk response planning, risk monitoring and control

- Effective management in specific projects (e.g., IT outsourcing, managing global projects)

2. Reading List
2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Schwalbe, K., Information Technology Project Management, 9th edition, 2019. ISBN: 978-9814844017.
2.	Fuller, Valacich, George, Information Systems Project Management – A Process and Team Approach. ISBN: 0-13-145417-X.
3.	Olson, D.L., Information systems project management, Business Expert Press, 2015. ISBN: 9781631571220.
4.	McManus, John and Wood-Harper, Prof. Trevor, Information Systems Project Management, Prentice Hall 2003. ISBN: 0-273-64699-0.
5.	Schwalbe, Kathy, Friedrichsen, Lisa and Bunin, Rachael, New Perspectives on Microsoft Project 2002 - Introductory, Course Technology 2003.
6.	Hughes, Bob and Cotterell, Mike, Software Project Management, 3rd edition, McGraw-Hill, 2002.

Course Title	:	Data Visualization
Course Code	:	IS6335
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**
   (A 150-word description about the course)

   "A picture is worth a thousand words." The human race is wired to perceive pictorial messages and discover patterns using intuitions. In a data-driven business environment, the ability to convey hard messages with clever visualization is essential and valuable.

   The goal of this course is to learn how to use visualization tools for data interpretation under the business context. We will explore ways to organize and derive meaning from vast amounts of data, with interesting visual examples from different application areas. Students will learn concepts, methods, and applications of data visualization methods. Students will also learn visualization tools from GUI-based Tableau software to more advanced programmable visualization packages in R and Python. They will be guided in creating engaging and interactive visualizations, as well as experiencing virtual reality applications. Students will apply the concepts and skills to designing a final project.

   The course has no prerequisite of programming background, although prior experience with coding languages will be helpful.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe and gain insight into the theory of visual presentation and the use of visual report in business communication and analytics.	40%	✓	✓	
2.	Acquire and innovatively apply skills in using GUI-based Tableau software to create compelling visual report and analysis.	20%	✓	✓	✓
3.	Acquire and innovatively apply skills in using programmable visualization tools (R and Python packages) to create flexible	40%	✓	✓	✓

	visual presentations. Use visualization to augment machine learning and statistical analysis in applications.					

* If weighting is assigned to CILOs, they should add up to 100%. 100%

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.			Hours/week
		1	**2**	**3**	**(if applicable)**
TLA1: Lecture	Lectures will introduce the basic design theory for visual presentation and cases of innovative visualization applications. Lectures will also cover the basic programming techniques and use of Tableau, R, and Python packages.	✓	✓	✓	1 Hour/Week
TLA2: Tutorial	Tutorials will provide hands on experiences to use the visualization tools of Tableau, R, and Python introduced in the lectures.		✓	✓	2 Hours/Week
TLA3: Group Project	Students apply the visualization tools to form an analytics report. They need to identify a data source and form a data driven story in the project.	✓	✓	✓	

4.   Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.			Weighting*	Remarks#
	1	2	3		
Continuous Assessment: 60%					
AT1: Continuous Assessment Students are encouraged to discuss and reflect on the materials covered in lectures and tutorials.	✓	✓	✓	10%	
AT2: Assignments Assignments will be given to assess student's ability to apply the tools learned.		✓	✓	30%	
AT3: Group Project A group project will be assigned. Students need to apply the visualization tools to form an analytics report. They need to identify a data source and form a data driven story in the project.	✓	✓	✓	20%	
Examination: 40% (duration: one 2-hour exam)					

AT4: Final Examination Students will be assessed via the examination on their understanding of concepts learned in class and reading materials, and their ability to use visualization tools for specific tasks.	✓	✓	✓	40%	
* The weightings should add up to 100%.				100%	

#Remark: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5.   Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task (AT)	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Continuous Assessment	CILO 1-3 Demonstrate evidence of active learning through participating in the class discussion, asking critical questions and completing extra-credit activities.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Assignments	CILO 2-3 Demonstrate good understanding of course content and capability to apply the skills learned to create visual presentations.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3: Group Project	CILO 1 Apply principle learned about the design theory of visual presentation.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	CILO 2-3 Demonstrate capability to apply the tools (menu-based and programmable) to explore data set and create data driven story.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT4: Final Examination	CILO 1-3 Demonstrate good understanding of visualization design principle and master the skills required for effective visualization.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   Big Data; Visualization; Data Charts; Dashboard; Power View; Tableau; Infographics; Text Visualization; Social Network Visualization; Visualization on mobile devices.

2. **Reading List**
2.1   **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Tony Fischetti and Brett Lantz, <u>R: Data Analysis and Visualization</u>, Packt Publishing, 2016.
2.	Mario Dobler and Tim Gromann, Data Visualization with Python: Create an Impact with Meaningful Data Insights Using Interactive and Engaging Visuals, Packt Publishing, 2019.

2.2   **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Nathan Yau, <u>Visualize This; The Flowing Data Guide to Design, Visualization, and Statistics</u>, Wiley, 2011.
2.	Stephen Few, <u>Show Me the Numbers: Designing Tables and Graphs to Enlighten</u>, Analytics Press, 2012.
3.	Hadley Wickham, <u>ggplot2</u>, Springer, 2016.
4.	Daniel G. Murray, <u>Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software</u>, Wiley 2016.
5.	Stephanie D. H. Evergreen, <u>Effective Data Visualization: The Right Chart for the Right Data</u>, SAGE Publication, 2016.

Course Title	:	Information Systems Project
Course Code	:	IS6912
Course Duration	:	Two Semester (26 weeks)
No. of Credit Units	:	6
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	Nil
Exclusive Courses	:	Nil

Course Details

1. **Abstract**
   (A 150-word description about the course)

   The aim of this course is to develop the student's expertise in a chosen subject area directly related to the programme, through the application of knowledge, skills and information technology acquired during the programme in developing a solution to a specific information systems problem.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Plan, schedule, monitor, control and report on a substantial piece of work.	25%			
2.	Undertake applied research or development work in information systems.	25%	✓	✓	✓
3.	Select and assess material relevant to the chosen problem area.	25%			
4.	Apply some of the methods, tools and techniques acquired during the programme in an analysis of the problem area.	25%	✓	✓	✓

* If weighting is assigned to CILOs, they should add up to 100%.   100%

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)**
   (TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
TLA1: Consultation	As a project, students can expect to meet an assigned supervisor on a one-to-one basis over the course of the project. As such, there are no formal TLAs for the course.	✔	✔	✔	✔	
TLA2: Project	This course has no formal syllabus. Each student will be required to undertake an individual project which uses the subject matter and skills developed in the programme. Each supervisor will supervise at most five students. The Course Leader will approve all supervisor-student pairings. Students will finalise their choice of topic by week 2 of the semester when the project starts. Students will be encouraged to propose their own topics, in consultation with their supervisor. Topics may also be provided, supporting staff interests or related to the needs of a 'client' associated with a member of staff. Each student will be required to submit a project proposal for approval by the project supervisor. For projects in a specialist area, a staff member other than the project supervisor may be the "resident consultant". The "resident consultant" will provide expertise on the students project subject. Project assessment, however, will remain with the project supervisor. The topic area of the project will be chosen so that the aims of the project can be achieved. Criteria for choice include: compatibility with the contents of the programme, compatibility with the interests of a supervisor, availability of necessary specialised resources, local interest and significance.	✔	✔	✔	✔	

4. **Assessment Tasks/Activities (ATs)**
   (ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
AT1: Individual Project[#] There are six stages in the project, as below:	✔	✔	✔	✔	100%	

Stage	Normal Completion Date (Semester/Week)	Marks (%)						
Approval of the project title	A/2	0						
Completion of the 1st interim report	A/7	10						
Completion of the 2nd interim report	A/13	10						
Completion of the 3rd interim report	B/6	10						
Completion of the complete project draft	B/11	0						
Submission of the completed project	B/13	70						
The weightings should add up to 100%.							100%	

\# The project is to be prepared and submitted in accordance with the standards specified by the Project Supervisor. Where appropriate, the Project Report will be accompanied by a soft copy of the whole report, including any software developed as part of the project.

The Project will be assessed on the written project and the delivered information systems product if appropriate. The project report, including the software deliverable if any, will be marked by the supervisor.

In addition, a student may be required to make an oral presentation of the project. The oral presentation will not be marked. It will be used to confirm that the work presented in the project was that of the student, to clarify points of concern in the project, and to moderate individual marks across the student cohort (if any).

5. **Assessment Rubrics**
   (Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Individual Project	Ability to plan, schedule, monitor, control and report on a substantial piece of work.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to undertake applied research or development work in information systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to select and assess material relevant to the chosen problem area.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to apply some of the methods, tools and techniques acquired during the programme in an analysis of the problem area.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

As an individual project, there is no keyword syllabus. The project supervisor may advise a student to read materials in his/her chosen area – but this will be on a case by case basis and cannot be prescribed in a document like this.

2.   Reading List
2.1   Compulsory Readings
(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2   Additional Readings
(Additional references for students to learn to expand their knowledge about the subject.)

1.	It is not appropriate to recommend readings given that the topic will be selected by the student and supervisor.

Course Title	:	Knowledge Management
Course Code	:	IS6921
Course Duration	:	One Semester (13 weeks)
No. of Credit Units	:	3
Level	:	P6
Medium of Instruction	:	English
Medium of Assessment	:	English
Prerequisites	:	Nil
Precursors	:	Nil
Equivalent Courses	:	IS6921M Knowledge Management
Exclusive Courses	:	Nil

Course Details

1. **Abstract**
   (A 150-word description about the course)

   This course aims to:
   • Introduce students to the fundamental concepts in the study of knowledge and its management, including the processes of creation, capture, sharing, and application.
   • Develop students' analytical skills in the evaluation of current trends in knowledge management and their manifestations in business and industry.
   • Develop students' practical skills in the implementation and management of KM practices across different business domains.

2. **Course Intended Learning Outcomes (CILOs)**
   (CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe and communicate the key concepts of applying knowledge management to enable organisations to achieve sustainable competitive advantages.	20%			
2.	Gain insights to the core methods, techniques, and tools for knowledge management enabled by information technology.	25%			
3.	Critically analyse the role and use of knowledge in organizations and institutions, and identify and evaluate the typical obstacles that KM aims to overcome.	20%	✓	✓	
4.	Develop creative problem solving skills in planning specific KM implementation and management strategies with reference to the business environment of specific organisations.	20%	✓	✓	✓

5.	Discover how emerging information systems applications can affect knowledge-based organisations and knowledge workers in the future.	15%	✓	✓	

* If weighting is assigned to CILOs, they should add up to 100%. 100%

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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)
(TLAs designed to facilitate students' achievement of the CILOs.)

IS6921 is taught as a 3 hour seminar. Seminars are designed to contain a mix of "lecture" and "discussion", the latter often supported by case analysis.

TLA	Brief Description	CILO No.					Hours/week
		1	2	3	4	5	(if applicable)
TLA1. Lecture	Concepts and applications of knowledge management are introduced and explained by the instructor, and students are required to undertake a number of different activities designed to facilitate their learning. These may include such activities as (but not limited to) problem solving, individual review and reflection, small group discussions, and large classroom discussions.	✓	✓	✓			
TLA2. Case Studies	Specific cases of knowledge management practices and applications from real-world organisational contexts are discussed and presented.	✓	✓	✓	✓	✓	
TLA3. Demonstrations	System demonstrations are used to highlight various technologies that can be applied to knowledge management.				✓	✓	
TLA4. Group Project	Developing the hands-on skills for assessing knowledge management practices and designing knowledge management solutions to organisational problem situations.			✓	✓	✓	
TLA5. On-Line Discussion	It is a means of self-reflection and sharing concepts, techniques, and methods of knowledge management among students within or after formal classes.	✓	✓	✓	✓	✓	

4.   Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting *	Remarks
	1	2	3	4	5		
Continuous Assessment: 50%							

AT1. Seminar Exercises and Participation Each seminar consists of exercises, small group discussions, self-reflection, or student presentations to assess students' understanding of the chosen topics and their abilities to apply their skills.	✓	✓	✓	✓	✓	10%	
AT2. KM Assessment Project Phase 1 of a group project, which includes a project report and presentation, will be assigned to help students identify knowledge management scenarios and assess knowledge management practices in a real organization.	✓	✓	✓		✓	20%	
AT3. KM Solution Project Phase 2 of the group project, which includes a project report and presentation, will be allocated to help students propose how to apply knowledge management processes and technologies to support knowledge management problem scenarios as identified in KM the Assessment Project.	✓	✓		✓	✓	20%	
Examination: 50% (duration: one 2-hour exam)							
AT4. Examination A written examination is developed to assess each student's competence level of the taught subjects.	✓	✓	✓	✓	✓	50%	
* The weightings should add up to 100%.						100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5.   **Assessment Rubrics**
(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1. Seminar Exercises and Participation	Ability to describe and communicate the key concepts of applying knowledge management to enable organisations to achieve sustainable competitive advantages	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to gain insights to the core methods, techniques, and tools for knowledge management enabled by information technology	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to critically analyse the role and use of knowledge in organizations and institutions, and identify and evaluate the typical obstacles that KM aims to overcome	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to develop creative problem solving skills in planning specific KM implementation and management strategies with reference to the business environment of specific organisations	High	Significant	Moderate	Basic	Not even reaching marginal levels

	Capability to discover how emerging information systems applications can affect knowledge-based organisations and knowledge workers in the future	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2. KM Assessment Project	Ability to describe and communicate the key concepts of applying knowledge management to enable organisations to achieve sustainable competitive advantages	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to gain insights to the core methods, techniques, and tools for knowledge management enabled by information technology	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to critically analyse the role and use of knowledge in organizations and institutions, and identify and evaluate the typical obstacles that KM aims to overcome	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to discover how emerging information systems applications can affect knowledge-based organisations and knowledge workers in the future	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3. KM Solution Project	Ability to describe and communicate the key concepts of applying knowledge management to enable organisations to achieve sustainable competitive advantages	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to gain insights to the core methods, techniques, and tools for knowledge management enabled by information technology	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to develop creative problem solving skills in planning specific KM implementation and management strategies with reference to the business environment of specific organisations	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to discover how emerging information systems applications can affect knowledge-based organisations and knowledge workers in the future	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT4. Examination	Ability to describe and communicate the key concepts of applying knowledge management to enable organisations to achieve	High	Significant	Moderate	Basic	Not even reaching marginal levels

	sustainable competitive advantages					
	Ability to gain insights to the core methods, techniques, and tools for knowledge management enabled by information technology	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to critically analyse the role and use of knowledge in organizations and institutions, and identify and evaluate the typical obstacles that KM aims to overcome	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to develop creative problem solving skills in planning specific KM implementation and management strategies with reference to the business environment of specific organisations	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to discover how emerging information systems applications can affect knowledge-based organisations and knowledge workers in the future	High	Significant	Moderate	Basic	Not even reaching marginal levels

Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   • The key concepts of knowledge management: the differences between data, information, and knowledge; knowledge management processes; knowledge management strategies; knowledge management infrastructure;
   • Knowledge management assessment: Qualitative KM assessments, Quantitative KM assessments;
   • KM practices/mechanisms and technologies: types of KM practices/mechanisms, technologies supporting knowledge management processes, relationship between type of support and technology

2. **Reading List**
2.1   **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2   **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Davenport, T.H., Harris, J.G., 2007, Competing on Analytics: The New Science of Winning, Harvard Business School Press.
2.	Saito, A, Umemoto, K., and Ikeda M., 2007, "A strategy-based ontology of knowledge management technologies", Journal of Knowledge Management, 11:1, pp. 97-114.
3.	Stoyko, P. Fang, Y., 2007, Lost & Found: A Smart-Practice Guide to Managing Organizational Memory, Library and Archives Canada Cataloguing in Publication.
4.	Becerra-Fernandez, I., Gonzalez, A., Sabherwal, R., 2004, Knowledge Management: Challenges, Solutions, and Technologies, Pearson Prentice Hall, ISBN: 0-13-101606-7.

5.	Wenger, E. C. and W. M. Snyder, 2000, "Communities of practice: The organizational frontier." Harvard Business Review 78(1): 139.
6.	Hansen, MT., Nohria, N., & Tierney, T., 1999, "What is Your Strategy for Managing Knowledge", Harvard Business Review, 77(2).
7.	Davenport, T.H., Prusak, Laurence, 1998, "Working Knowledge: How Organizations Manage What They Know", Harvard Business School Press.

2.3 Online Resources

Appropriate articles from relevant journals and web sites will be used

Academic Calendar

Semester A 2021 – 2022

August 2021

	S	M	T	W	T	F	S
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
WK 1	29	30	31				

Events / Public Holidays

2 - 7 Examination Period

9 - 28 Term Break

30 Aug - 27 Nov Semester A 2021/22

September 2021

	S	M	T	W	T	F	S
				1	2	3	4
WK 2	5	6	7	8	9	10	11
WK 3	12	13	14	15	16	17	18
WK 4	19	20	21	22	23	24	25
WK 5	26	27	28	29	30		

Events / Public Holidays

22 Day following Mid-Autumn Festival

October 2021

	S	M	T	W	T	F	S
						1	2
WK 6	3	4	5	6	7	8	9
WK 7	10	11	12	13	14	15	16
WK 8	17	18	19	20	21	22	23
WK 9	24	25	26	27	28	29	30
	31						

Events / Public Holidays

1 National Day

4 Graduation Date

14 Chung Yeung Festival

November 2021

	S	M	T	W	T	F	S
WK 10		1	2	3	4	5	6
WK 11	7	8	9	10	11	12	13
WK 12	14	15	16	17	18	19	20
WK 13	21	22	23	24	25	26	27
	28	29	30				

Events / Public Holidays

27 Last Day of Teaching

29 Nov - 4 Dec Student Revision Period

December 2021

	S	M	T	W	T	F	S
				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	

Events / Public Holidays

6 - 18 Examination Period

20 Dec 2021 - 8 Jan 2022 Semester Break

25 Christmas Day

27 First weekday after Christmas Day

Semester B 2021-22

January 2022

	S	M	T	W	T	F	S
							1
	2	3	4	5	6	7	8
WK 1	9	10	11	12	13	14	15
WK 2	16	17	18	19	20	21	22
WK 3	23	24	25	26	27	28	29
	30	31					

Events / Public Holidays

20 Dec 2021 - 8 Jan 2022 Semester Break

1 First Day of January

10 Jan - 14 Apr Semester B 2021/22

31 Jan - 6 Feb Lunar New Year Break

February 2022

	S	M	T	W	T	F	S
			1	2	3	4	5
WK 4	6	7	8	9	10	11	12
WK 5	13	14	15	16	17	18	19
WK 6	20	21	22	23	24	25	26
WK 7	27	28					

Events / Public Holidays

1 - 3 Lunar New Year Holidays

4 Graduation Date

March 2022

	S	M	T	W	T	F	S
			1	2	3	4	5
WK 8	6	7	8	9	10	11	12
WK 9	13	14	15	16	17	18	19
WK 10	20	21	22	23	24	25	26
WK 11	27	28	29	30	31		

April 2022

	S	M	T	W	T	F	S
						1	2
WK 12	3	4	5	6	7	8	9
WK 13	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

Events / Public Holidays

5 Ching Ming Festival

14 Last Day of Teaching

15 Good Friday

16 Day following Good Friday

18 Easter Monday

19 - 23 Student Revision Period

25 Apr - 10 May Examination Period

May 2022

	S	M	T	W	T	F	S
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

Events / Public Holidays

2 Day following Labour Day

9 Day following Buddha's Birthday

11 May - 4 Jun Semester Break

Summer Term 2022

June 2022

	S	M	T	W	T	F	S
				1	2	3	4
WK 1	5	6	7	8	9	10	11
WK 2	12	13	14	15	16	17	18
WK 3	19	20	21	22	23	24	25
WK 4	26	27	28	29	30		

Events / Public Holidays

11 May - 4 Jun Semester Break

1 Graduation Date

3 Tuen Ng Festival

6 Jun - 23 Jul Summer Term 2022

July 2022

	S	M	T	W	T	F	S
						1	2
WK 5	3	4	5	6	7	8	9
WK 6	10	11	12	13	14	15	16
WK 7	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						

Events / Public Holidays

1 HK SAR Establishment Day

23 Last Day of Teaching

25 - 30 Student Revision Period

August 2022

	S	M	T	W	T	F	S
		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			

Events / Public Holidays

1 - 6 Examination Period

8 - 27 Term Break