

Division of Information Systems & Management Engineering

Program of Big Data Management and Applications for International

Students (2020)

I. Introduction

Big Data Management and Applications (BDMA) is an undergraduate program offered by the Division of Information Systems and Management Engineering. This program is developed against the backdrop of the era of big data, focusing on big data management and governance and applications of data analysis theories and methods in management. Areas of BDMA include Business Statistical Analysis, Business Intelligence.

II. Objectives and Learning Outcomes

The curriculum of this program is based on the standard set by the National Education Guidance Committee and refers to similar programs run by leading domestic and foreign higher educational institutions. The curriculum aims to

1. cultivate skills that allow students to adapt to a dynamic economy,
2. meet the demand for talent in Guangdong, Hong Kong, and the Macao Greater Bay Area,
3. train students in evidence-based management and systematic management thinking,
4. disseminate interdisciplinary knowledge from Economics, Management, Information Systems, and Management Engineering,
5. develop students' capabilities in theoretical and quantitative analysis,
6. provide students the opportunity to develop entrepreneurship skills, and
7. educate future management talents with professional ethics, modern management knowledge, and international perspectives.

Graduates of this program are expected to satisfy requirements in the following three aspects.

1. Knowledge requirements: Master management science and engineering theories; be well informed about various information and engineering technologies; know the fundamentals of science, arts, humanities, and the interlinks among them; understand big data processing, analytic methods, and specialized management science for data management in e-commerce; be skilled in business data modeling and applying various technologies, methods and tools to decision analysis.

2. Capability requirements: Possess the ability to independently acquire and update relevant knowledge in management science and engineering; be competent in comprehensively applying professional knowledge to practice; be skilled at logical thinking and communication; have strong

capabilities in organizational coordination; be proficient in applying foreign languages of the trade; be able to make comprehensive use of management science, information technology, and engineering methods to solve business problems; be innovative in applying big data management and application theories; be capable of conducting business analysis of big data and providing support for decision making.

3. Quality Requirements: Have sophisticated ideological and political views and positive outlook on life and values; have strong legal awareness, high sense of social responsibility, professional ethics, teamwork spirit and social adaptability; possess scientific spirit, compassion, and professionalism; have innovative spirit and entrepreneurial consciousness; have healthy psychology and physique.

III. Study Length and Graduation Requirements

Study length: 4 years.

Degree conferred: Bachelor of Management

The minimum credit requirement for graduation: 141 credits (not including English courses);

Category	Module	Minimum Credit Requirement
General Education (GE) Required Courses (49 credits)	Science	29
	Physical Education	4
	Chinese Languages & Culture	16
General Education (GE) Elective Courses (12 credits)	Humanities	4
	Social Sciences	4
	Arts	2
	Science	2
Major Course (80 credits)	Major Foundational Courses	30
	Major Core Courses	21
	Major Elective Courses	16
	Research Projects, Internship and Undergraduate Thesis / Projects	13
Total (not including English courses)		141

IV. Discipline

Management Science and Engineering

V. Main Courses

Major Foundational Courses: Microeconomics, Macroeconomics, Management, Probability and Statistics, Marketing, Management Information System, Prescriptive Decision Analytics, Data Management and Databases, Business Data Structures and Algorithms, Management System Analysis and Design.

Major Core Courses: Big Data Analysis and Application, Big Data Management and ERP, Big Data Governance and Business Model, Business Intelligence, Data Intelligence and Decision Analytics, Data Mining and Business Applications, Advanced Management System Analysis and Design.

VI. Practice-Based Courses

Introduction to Computer Programming A, Management Information System, Prescriptive Decision Analytics, Business Data Structures and Algorithms, Management System Analysis and Design, Big Data Management and ERP, Data Mining and Business Applications, Advanced Management System Analysis and Design, Parallel and Cloud Computing, Statistical Data Analysis with SAS, Social Network Models and Applications.

VII. Pre-requisites for Major Declaration

Major Declaration Time	Course Code	Course Name	Prerequisite
Declare major at the end of First Year	MA101B	Calculus I A	
	MA102B	Calculus II A	MA101B
	MA107A	Linear Algebra A	
	CS102A	Introduction to Computer Programming A	
Declare major at the end of Second Year	MA101B	Calculus I A	
	MA102B	Calculus II A	MA101B
	MA107A	Linear Algebra A	
	CS102A	Introduction to Computer Programming A	
	MA212	Probability and Statistics	MA102B
	EBA106	Management	
	MIS204	Prescriptive Decision Analytics	MA212
NOTES: You must fulfill the prerequisites before declaring the major.			

VIII. Requirements for GE Required Courses

(I) Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept.
MA101B	Calculus I A	4		4	1/Fall	E		MATH
MA102B	Calculus II A	4		4	1/Spr	E	MA101B	MATH
MA107A	Linear Algebra A	4		4	1/Fall	E		MATH
PHY103B	General Physics B (I)	4		4	Spr/ Fall	1/Fall		PHY
PHY105B	General Physics B (II)	4		4	Spr/ Fall	1/Spr	PHY103B	PHY
BIO102B	Introduction to Life Science	3		3	1/Spr	E		BIO
CS102A	Introduction to Computer Programming A	3	1	4	1/Fall	E		CSE
CH101B	General Chemistry B	3		3	1/Spr	E		CHEM
Total		29	1	30				

(II) Physical Education

Course Code	Course Name	Credits	Hours/week	Terms	Instruction language	Prerequisite	Dept.
GE131	Physical Education I	1	2	Fall	C	NA	PE Center
GE132	Physical Education II	1	2	Spr	C	NA	
GE231	Physical Education III	1	2	Fall	C	NA	
GE232	Physical Education IV	1	2	Spr	C	NA	
GE331	Physical Education V	0	/	Fall	C	NA	
GE332	Physical Education VI	0	/	Spr	C	NA	
GE431	Physical Education VII	0	/	Fall	C	NA	
GE432	Physical Education VIII	0	/	Spr	C	NA	
Total		4	8				
<p>Note: All physical education courses are general required courses. For Semester 1-4, each course (GE131, GE132, GE231, GE232) counted as 1 credit; for semester 5-8, (GE331, GE332, GE431, GE432) are extracurriculum courses without no credits, details can be referred to Physical Education Curriculum Program of Sustech.</p>							

(III) Chinese Languages & Culture

Course Code	Course Name	Credit	Hours/week	Term	Language Instruction	Prerequisite	Dept.
CLE008	Elementary Chinese I	2	4	1/Fall	B	NA	CLE
CLE009	Elementary Chinese II	2	4	1/Spr	B	CLE008	
CLE027	Intermediate Chinese I	2	4	2/Fall	B	CLE009	
CLE028	Intermediate Chinese II	2	4	2/Spr	B	CLE027	
CLE031	Advanced Chinese I	2	4	3/Fall	B	CLE028	
CLE032	Advanced Chinese II	2	4	3/Spr	B	CLE031	
CLE033	Chinese Culture	2	2	Spr/Fall	B/E	NA	CLE/ HUM/ SSC
CLE034	Chinese History	2	2	Spr/Fall	B/E	NA	

(IV) English Language

Students will undertake the English Placement Test and be placed into three levels according to the result of the test and their performance in the National College Entrance Exam. Students at different levels are required to take the courses with a different credit value in total.

Level A: 6 credits; SUSTech English III, and English for Academic Purposes

Level B: 10 credits; SUSTech English II, SUSTech English III, and English for Academic Purposes

Level C: 14 credits; SUSTech English I, SUSTech English II, SUSTech English III, and English for Academic Purposes.

Course Code	Course Name	Credit	Hours/week	Language Instruction	Prerequisite	Dept.
CLE021	SUSTech English I	4	4	E	NA	CLE
CLE022	SUSTech English II	4	4	E	CLE021	
CLE023	SUSTech English III	4	4	E	CLE022	
CLE030	English for Academic Purposes	2	2	E	CLE023	

IX Requirements for GE Elective Courses

(I) Students are required to complete 4 credits for the Humanities Module and Social Sciences Module respectively, and 2 credits for the Music and Art Module. (Information about the available courses and the instruction language will be announced before the course selection session)

(II) Students are required to complete at least 2 credits from the Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept.
PHY104B	Experiments of Fundamental Physics	2	2	4	1/Spr	B/E	-	PHY
CS205	C/C++Program Design (It is recommended to choose this course)	3	1	4	2/Spr	E	-	CSE
Total		5	3	8				

X. Major Course Arrangement

Table 1: Major Required Course (Foundational and Core Courses)

Course Category	Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	take the course Advised term to	language Instruction	Prerequisite	Dept.
Major Foundational Courses	FIN201	Microeconomics	3		3	Fall	1/Fall	B		FIN
	FIN204	Macroeconomics	3		3	Spr	1/Spr	B		FIN
	EBA106	Management	3		3	Fall/ Spr	1/Spr	E		COB
	MA212	Probability and Statistics	3		3	Fall	2/Fall	B	MA102B	MATH
	MIS202	Marketing	3		3	Fall	2/Fall	E		ISME
	EBA203	Management Information System	3	1	4	Fall	2/Fall	E	CS102A	COB
	MIS204	Prescriptive Decision Analytics	3	1	4	Fall/ Spr	2/Spr	E	MA212	ISME
	MIS205	Data Management and Databases	3	1	4	Spr	2/Spr	B	CS102A	ISME
	MIS206	Business Data Structures and Algorithms	3	1	4	Spr	2/Spr	E	CS102A	ISME
	EBA207	Management System Analysis and Design	3	1	4	Spr	2/Spr	E	EBA203	COB
	Total			30	5	35				
Major Core Courses	MIS301	Big Data Analysis and Application	3	1	4	Fall	3/Fall	E	MA212	ISME
	MIS302	Big Data Management and ERP	3	1	4	Fall	3/Fall	C	CS102A, MIS205	ISME
	MIS303	Big Data Governance and Business Model	3	1	4	Spr	3/Spr	E	MIS302	ISME
	MIS304	Business Intelligence	3	1	4	Spr	3/Spr	E	MIS301	ISME
	MIS305	Data Intelligence and Decision Analytics	3	1	4	Spr	3/Spr	E	MIS301	ISME
	MIS306	Data Mining and Business Applications	3	1	4	Spr	3/Spr	E	MIS301, MIS205	ISME
	MIS307	Advanced Management System Analysis and Design	3	1	4	Fall	3/Fall	E	EBA207	ISME
	Total			21	7	28				
Practice-Based	MIS370	Internship	3	3	6	Smr	2 or 3/Smr	B		ISME
	MIS480	Science & Technology Innovation Projects	2	2	4	Fall/ Spr/ Smr	Any term after the first	B		ISME

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	MIS490	Thesis	8	8	16	Fall/ Spr	4/FallS pr	B		ISME
			13	13	26					
<p>Note: Data Structures and Algorithm Analysis B (CS203B) is regarded as equivalent to Business Data Structures and Algorithms (MIS206).</p>										

Table 2: Major Elective Courses

Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	take the course Advised term to	language Instruction	Prerequisite	Dept.
EBA103	Lectures on the Frontiers of Big Data Management and Applications	2		2	Spr	1/Spr	B		COB
EBA105	Business Communication and Protocol	2		2	Spr	1/Spr	C		COB
MIS104	Business Model Research	2		2	Fall	1/Fall	C		ISME
CS209A	Computer System Design and Applications A	3	1	4	Fall /Spr	1/Spr	B	CS102A/CS102B	CSE
MIS105	Management Innovations and Big Data Practices	2	1	8	Smr	1/Smr	C		ISME
FETS101	Technical Innovation and Financial Innovation	1		1	Smr	2/Smr	C	FIN206	FIN
MIS207	Stochastic Models and Business Applications	3		3	Spr	2/Spr	E		ISME
FIN203	Financial Accounting	3		3	Fall	2/Fall	B		FIN
FIN206	Corporate Finance	3		3	Spr	2/Spr	B	FIN203	FIN
MIS309	Business History and Economic Development Model in China and Overseas	3		3	Spr	3/Spr	B		ISME
CS316	Parallel and Cloud Computing	3	1	4	Spr	3/Spr	B		CSE
MA409	Statistical Data Analysis with SAS	3	1	4	Spr	3/Spr	B	MA329	MATH
MIS310	Social Network Models and Applications	3	1	4	Spr	3/Spr	B	MIS301	ISME
MIS311	Chinese Economic and Business Law	3		3	Spr	3/Spr	B		ISME
MIS312	Entrepreneurial Thinking and Management	3		3	Spr	3/Spr	B		ISME
FET306	Business Analytics with Big Data	3	1	4	Spr	3/Spr	B		FIN
FIN311	Artificial Intelligence and Its Applications in Finance	3		3	Fall	3/Fall	B	CS102A	FIN
MIS321	Consumer behavior	3		3	Spr	3/Spr	B		ISME
MIS322	International Business	3		3	Fall	3/Fall	E		ISME
MIS323	Marketing Research	3		3	Spr	3/Spr	B		ISME
MIS401	Advanced Marketing	3		3	Fall	4/Fall	B	MIS202	ISME
MIS402	Empirical Research in Big Data	3	1	3	Fall	4/Fall	B	MIS306	ISME
MIS403	Big Data and Cluster Project Management	3		3	Spr	4/Spr	B	MIS302	ISME
MIS404	Operations Management	3		3	Spr	4/Spr	B	MIS204	ISME

MIS405	Advanced E-commerce and Management	3		3	Fall	4/Fall	B		ISME
MIS406	Judgment and Decision Making	3		3	Fall	4/Fall	B		ISME
EBA420	Management Frontiers and Practices I	3	1	3	Fall	4/Fall	B		COB
EBA421	Management Frontiers and Practices II	3	1	3	Spr	4/ Spr	B		COB
Total		78	9	92					

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	take the course Advised term to	language Instruction	Prerequisite	Dept.
CS102A	Introduction to Computer Programming A	3	1	4	Fall/ Spr	1/Fall	B		CSE
PHY104B	Experiments of Fundamental Physics	2	2	4	Fall/ Spr	1/ Spr	B/E		PHY
CS205	C/C++Program Design	3	1	4	Fall/ Spr	2/Spr	E		CSE
EBA203	Management Information System	3	1	4	Fall	2/Fall	E	CS102A	COB
MIS204	Prescriptive Decision Analytics	3	1	4	Fall/ Spr	2/Spr	E	MA212	ISME
MIS205	Data Management and Databases	3	1	4	Spr	2/Spr	B	CS102A	ISME
MIS206	Business Data Structures and Algorithms	3	1	4	Spr	2/Spr	E	CS102A	ISME
EBA207	Management System Analysis and Design	3	1	4	Spr	2/Spr	E	EBA203	COB
MIS301	Big Data Analysis and Application	3	1	4	Fall	3/Fall	E	MA212	ISME
MIS302	Big Data Management and ERP	3	1	4	Fall	3/Fall	C	CS102A、 MIS205	ISME
MIS303	Big Data Governance and Business Model	3	1	4	Spr	3/Spr	E	MIS302	ISME
MIS304	Business Intelligence	3	1	4	Spr	3/Spr	E	MIS301	ISME
MIS305	Data Intelligence and Decision Analytics	3	1	4	Spr	3/Spr	E	MIS301	ISME
MIS306	Data Mining and Business Applications	3	1	4	Spr	3/Spr	E	MIS301, MIS205	ISME
MIS307	Advanced Management System Analysis and Design	3	1	4	Fall	3/Fall	E	EBA207	ISME
CS209A	Computer System Design and Applications A	3	1	4	Fall /Spr	1/Spr	E	CS102A/CS102B	CSE
MIS105	Management Innovations and Big Data Practices	2	1	8	Smr	1/Smr	C		ISME
CS316	Parallel and Cloud Computing	3	1	4	Spr	3/Spr	B		CSE
MA409	Statistical Data Analysis with SAS	3	1	4	Spr	3/Spr	B	MA329	MATH
MIS310	Social Network Models and Applications	3	1	4	Spr	3/Spr	B	MIS301	ISME
FET306	Business Analytics with Big Data	3	1	4	Spr	3/Spr	B		FIN
MIS402	Empirical Research in Big Data	3	1	4	Fall	4/Fall	B	MIS306	ISME
EBA420	Management Frontiers and Practices I	3	1	4	Fall	4/Fall	B		COB

EBA421	Management Frontiers and Practices II	3	1	4	Spr	4/Spr	B		COB
MIS370	Internship	3	3	6	Smr	2 or 3/Smr	B		ISME
MIS480	Science & Technology Innovation Projects	2	2	4	Fall/ Spr/ Smr	Any term after the first academic year	B		ISME
MIS490	Thesis	8	8	16	Fall/ Spr	4/Fall Spr	B		ISME
Total		83	38	126					

Table 4: Overview of Course Hours and Credits

Course Category	Total Course Hours	Total Credits	Credit Requirements	Percentage of the Total*
General Education (GE) Required Courses (not including English courses)	800	49	49	34.75%
General Education (GE) Elective Courses			12	40%
Major Foundational Courses	560	30	30	21.28%
Major Core Courses	448	21	21	14.89%
Major Elective Courses	1472	78	16	11.35%
Research Projects, Internship and Undergraduate Thesis/Projects	416	13	13	9.22%
Total (not including English courses)	3696	191	141	100%

* Percentage of the total= Credit requirements of each line / Total credit requirements

Curriculum Structure of Big Data Management and Applications

Freshman Year	Sophomore Year	Junior Year	Senior Year
General Education	General Education	General Education	General Education
Microeconomics	Probability and Statistics	Big Data Analysis and Application	Thesis
Macroeconomics	Marketing	Big Data Management and ERP	
Management	Management Information System	Big Data Governance and Business Model	
	Prescriptive Decision Analytics	Business Intelligence	
	Data Management and Databases	Data Intelligence and Decision Analytics	
	Business Data Structures and Algorithms	Data Mining and Business Applications	
	Management System Analysis and Design	Advanced Management System Analysis and Design	
	Internship		
	Science & Technology Innovation Projects (Any term after the first academic year)		
Elective Courses			
Overview of Practice-Based Courses			
Note: The above is the recommended semester. Students can make adjustments according to their own academic plans.			