

國立政治大學 商學院

National Chengchi University  
College of Commerce



資訊管理學系  
108學年度課程手冊

Department of Management Information Systems  
Curriculum Guide



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# Introduction to the College of Commerce

The College of Commerce, National Chengchi University was established in 1958, and leads Taiwan in the development of advanced business administration programs with the best teachers and rigorous teaching and research spirit. It has cultivated elite talent for academic research and business administration with an equal emphasis on theory and practice, and has made significant contribution to the rapid development and transformation of Taiwan economy and society. The College of Commerce currently has eight departments and an independent graduate institute, three professional MBA programs and 16 college-level research centers. Key directions for future development include “FinTech and Innovation,” “Innovation, Entrepreneurship, and Organizational Innovation,” “Corporate Social Responsibility, Business Ethics, and Sustainable Development” and “IoT, Supply Chain, and e-Commerce Integration.”

## Elite Teachers

The College of Commerce currently has 151 full-time teachers, 90% of which have a Ph.D. from a world class university. The outstanding research and academic performance of elite teachers have allowed numerous teachers to win academic research awards from the Ministry of Education (MOE) and the Ministry of Science and Technology (MOST), and hold important positions, such as the convener of a business related field under the MOST, or the editor-in-chief, vice editor-in-chief, and editor of a specific field, for TSSCI journals. Furthermore, many professors serve crucial roles in industry and government, including government officials, consultants, or committee members and company supervisors or directors.

## Distinguished Alumni

Thanks to the rigorous professional training and cultivation by the College of Commerce, as well as the extraordinary performance of alumni in their professions, alumni of the College of Commerce have significant influence in industry, government, and academia. As a result, domestic industry has had a preference for graduates from the College of Commerce, including Chou Chun-Chi, Chairperson of Sinyi Realty Inc., Samuel Yin, Chairperson of Ruentex Financial Group, Song Wen-Chi, Former Chairperson of Taipei 101, Lin Hsin-I, Former Vice Premier, Lin I-Fu, Yin Chi-Ming, and Ho Mei-Yieh, Former Ministers of Economic Affairs, and Cheng Ting-Wang, Wu Si-Hua, and Edward Chow, Former Presidents of National Chengchi University are all alumni of the College of Commerce.

## International Certification and Recognition

The College of Commerce, NCCU is the only college of commerce in Taiwan to pass all three international accreditations - AACSB, EQUIS, and AACSB Accounting. Only seven colleges of commerce worldwide have pass all three accreditations. This shows that the quality, learning resources, international development, and corporate cooperation of the College of Commerce, NCCU has widely gained international recognition.

The College of Commerce became the 65th member of the Partnership in International Management (PIM) in October 2018. Members of the PIM include Cornell University Samuel Curtis Johnson Graduate School of Management, Imperial College Business, and National University of Singapore Business School, symbolizing that the level of internationalization at the College of Commerce, NCCU is on par with top tier colleges of commerce around the world.

## **Talent Cultivation and Industry-Academia Collaboration Project**

The College of Commerce, NCCU closely works with the industrial sector and maintains good and close relationships with major corporations. This not only helps broaden students' horizons, but also gives them an opportunity to apply what they learned in practice. It utilizes industry resources in course design, so that courses are closer to practice, or transforms a company's experience into a case study, which helps improve teaching quality. Teachers can also apply the case studies in their research to create greater academic capabilities.

To increase the depth of industry-academia collaboration, the College of Commerce established the [Cross Elite Company Platform] in 2015. Linking together benchmark enterprises in different industries around Taiwan through a membership. The "Horizon Broadening Forum" held each quarter gives teachers and students an opportunity to engage in in-depth interactions with the industrial sector, so that students will have a better grasp of corporate practices, while building a stronger partnership between the College of Commerce, NCCU and different companies.

## **Innovation in Teaching**

The College of Commerce adopted the assurance of learning (AOL) assessment method in coordination with the Association to Advance Collegiate Schools of Business (AACSB), in order to maintain elite levels of the international accreditation. The College strengthens students' core competencies, knowledge, and skills to ensure the learning effectiveness and quality assurance of higher education.

The College of Commerce, NCCU is always been a pioneer in the case study teaching method in Taiwan. It began to actively promote participatory teaching in 2005, and has selected over 50 seed instructors to participate in the Global Colloquium on Participant-Centered Learning (GloColl) in Harvard Business School. The College is promoting participatory teaching in courses, and hopes to inspire more creative ideas and diverse perspectives through active teacher-student interactions in class.

To train bilingual students with an expertise in international business administration, the College of Commerce, NCCU offered the first English Taught Program (ETP) in Taiwan in 2000. In response to trends and society's needs, the College offered numerous programs, such as the Supply Chain Management Credit Program, Big Data Analysis Program, and FinTech Expertise Program, to help cultivate experts in different fields for society.

## **International Exchange**

The College of Commerce, NCCU has exerted great efforts in different aspects of internationalization, and established the Office of International Affairs in 1999 to actively promote international cooperation and exchange. At present, the College has 139 sister schools and recommends or is recommended over 500 exchange students from foreign universities every year. The College launched five dual degree programs with Purdue University in 2019, including IMBA, MBA, master's programs of the Department of Accounting and Department of Management Information Systems, and the Department of Finance.

The College is also actively promoting international academic exchange, and co-organizes international conferences with renowned universities in the Asia-Pacific, such as the Chinese University of Hong Kong and Nanyang Technological University. The College is also frequently visited by famous professors and journal editors from overseas. The College began co-organizing the "Cross-Strait Business School Academic Forum" with Sun Yat-Sen Business School, Renmin Business School, and Xiamen University School of Management in 2018. The four schools take turns hosting the forum, which will benefit long-

term partnerships between the College and international academic institutions.

## Introduction to the Department of Management Information Systems

The Department of Management Information Systems was established in 1984, the first of its kind to be established by a national university in Taiwan. The Department's undergraduate program began accepting two classes of students starting in 1991, and is one of the most complete departments for cultivating information management talent in Taiwan. The purpose for establishing the Department is to create an integrated environment for teaching and research, develop information management related theories and technologies, cultivate talent with an expertise in information management, and promote information management applications and concepts to meet the needs of corporations and the general public for informatization. The Department of Management Information Systems ranked first in the national survey of best graduate institutes for information management in the "Special Issue on Employment and Education in 1998" published by Commonwealth Magazine in March 1998. Courses of the Department can be divided into five categories, namely business and management knowledge, information management, decision science and methodology, information technology and management, and system integration and application.

### A. Current Status

#### I. Integrated Course Information, Promotion of Business Automation:

The Department of Management Information Systems' teaching and research goals are to integrate information technology and business administration, and emphasize the connection between theoretical methods and practical applications, as well as interdisciplinary integration in research, development, and applications, so as to drive business automation. The Department also examines development strategies of the information technology industry:

**(I) Integration of information technology and business administration:** Described in detail in the following four points:

1. For the examination of applications of information management in Taiwan and worldwide, empirical studies are conducted on business process re-engineering, organizational change, and changes in management paradigms and best practices that may be brought by information technology.
2. For the development and management of large information systems, the Department focuses on planning and management, and examines the use of software engineering and project management technologies in the theoretical structure and actual approach to large systems.
3. For distributed expert decision support and knowledge management systems, the Department examines the integration of expert systems and decision support systems in a distributed system environment, as well as the knowledge management methods, structures, operating procedures, and system applications.
4. For the examination and application of integrated technologies, the Department emphasizes data use, models, and knowledge to support methods and technologies for business operations and management decisions.

**(II) Technology integration:** Integrates information technologies in the field of business, and combines information technologies with different mediums to develop gaming applications and multimedia technologies and applications.

**(III) Promotion of business automation:** In response to the rapidly changing information society, the most important topic of information management is reconstructing management systems in an information society. The Department will carry out interdisciplinary program integration in coordination with the College of Commerce's development direction and the spirit of NCCU to strengthen information research.

**(IV) Study on Cross-Strait information industry policy and development strategies:** Due to the growingly frequent Cross-Strait exchanges, China's economic and trade development have a

growing effect on Taiwanese enterprises. The Department will engage in exchanges with key universities in China in coordination with the College of Commerce, and will conduct comparative studies on Cross-Strait information industry development policies and information management related topics.

## **II. Direct Admission into Master's Program**

In the second half of 2009, the Department began implementing a five-year program for students to obtain their bachelor and master's degrees, so that they can more efficiently pursue a higher degree. Students may apply for the 4+1 program in their junior year, and may begin taking master's program courses in their senior year once their application is approved. If they successfully complete the credits required for the master's program, they will be able to graduate in their fifth year with a master's degree.

## **B. Future Prospects**

The Department of Management Information Systems' teaching and research goals are to integrate information technology and business administration, and emphasize the connection between theoretical methods and practical applications, as well as interdisciplinary integration in research, development, and applications, so as to drive business automation. The Department also examines development strategies of the information technology industry: The Department's main directions for teaching and research are summarized below:

### **I. Integration of information technology and business administration**

- (I) Development and management of large information systems: The Department focuses on planning and management, and examines the use of software engineering and project management technologies in the theoretical structure and actual approach to large systems.
- (II) Distributed expert decision support systems: The Department examines the integration of expert systems and decision support systems in a distributed system environment, as well as methods, structures, operating procedures, and system applications.
- (III) Examination and application of integrated technologies: The Department emphasizes data use, models, and knowledge to support methods and technologies for business operations and management decisions. Methods that are examined include database design and management, software engineering, mathematical planning, stochastic modeling, system simulation, artificial intelligence, knowledge engineering, user interface, network design and management, and the integrated application of these methods in the system development process.

### **II. Interdisciplinary Integration**

- (I) Integration of information technologies in the field of business.
- (II) Combine information technologies with different mediums to develop multimedia technologies and applications.

### **III. Promotion of Business Automation**

In light of Taiwan's rapid transition into an information society, the most important topic of information management is no longer the computerization of conventional management functions, but rather reconstructing management systems in an information society. Therefore, all fields of business will be impacted by automation, and need to reconstruct and prove fundamental theories. The Department will carry out interdisciplinary program integration in coordination with the College of Commerce's development direction.

#### **IV. Study on Cross-Strait information industry policy and development strategies**

Due to the growingly frequent Cross-Strait exchanges, China's economic and trade development have a growing effect on Taiwanese enterprises. The Department will engage in exchanges with key universities in China in coordination with the College of Commerce, and will conduct comparative studies on Cross-Strait information industry development policies and information management related topics.

- (I) Teacher recruitment: In response to the rapidly changing information management theories and practices, the Department will continue to recruit experts and scholars in each field to enrich the contents of teaching and research in each field.
- (II) Strengthen partnerships with the industrial sector: Teaching and research in the field of information management should prioritize application. As such, the Department has strengthened its collaborations with the industrial sector in recent years, providing students with precious experience from exchanges and collaborations.
- (III) Organize conferences on academic and practical developments in the field of information management: The conferences on academic and practical developments in the field of information management will not only elevate the Department's level of teaching and research, but also provide opportunities for learning from the elite of related fields in Taiwan and overseas.
- (IV) Expand international academic exchange: The development of information technologies has shortened distances, made information and technology exchanges more convenient, and gradually led different industries on the path towards internationalization. Therefore, the Department is actively expanding its international academic exchanges to increase the breadth and depth of teaching and research.

# **Introduction to the Doctoral Program of the Department of Management Information Systems**

## **A. Educational Objectives**

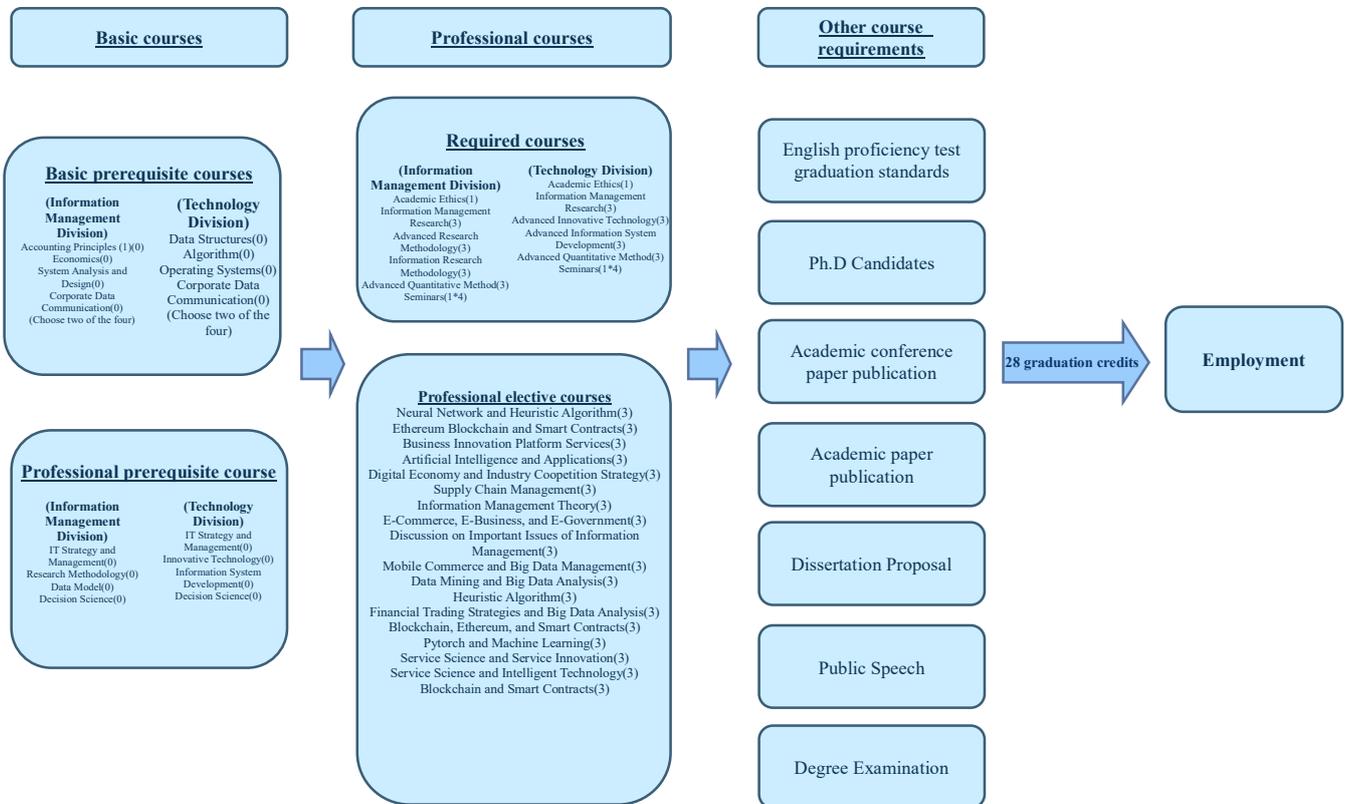
The Department of Management Information Systems' teaching and research goals are to integrate information technology and business administration, and emphasize the connection between theoretical methods and practical applications, as well as interdisciplinary integration in research, development, and applications, so as to drive business automation. The Department also examines development strategies of the information technology industry:

- I. Integration of information technology and business administration:** Described in detail in the following four points:
  - (I) For the examination of applications of information management in Taiwan and worldwide, empirical studies are conducted on business process re-engineering, organizational change, and changes in management paradigms and best practices that may be brought by information technology.
  - (II) For the development and management of large information systems, the Department focuses on planning and management, and examines the use of software engineering and project management technologies in the theoretical structure and actual approach to large systems.
  - (III) For distributed expert decision support and knowledge management systems, the Department examines the integration of expert systems and decision support systems in a distributed system environment, as well as the knowledge management methods, structures, operating procedures, and system applications.
  - (IV) For the examination and application of integrated technologies, the Department emphasizes data use, models, and knowledge to support methods and technologies for business operations and management decisions.
- II. Technology integration:** Integrates information technologies in the field of business, and combines information technologies with different mediums to develop gaming applications and multimedia technologies and applications.
- III. Promotion of business automation:** In response to the rapidly changing information society, the most important topic of information management is reconstructing management systems in an information society. The Department will carry out interdisciplinary program integration in coordination with the College of Commerce's development direction and the spirit of NCCU to strengthen information research.
- IV. Study on Cross-Strait information industry policy and development strategies:** Due to the growingly frequent Cross-Strait exchanges, China's economic and trade development have a growing effect on Taiwanese enterprises. The Department will engage in exchanges with key universities in China in coordination with the College of Commerce, and will conduct comparative studies on Cross-Strait information industry development policies and information management related topics.

## B. Course Map

### I. Academic Division

#### Department of Management Information Systems Doctoral Program Curriculum Map



### II. Industry Division

College-level Common Required Courses 13 credits	College-level Partially Required Courses 9 credits	Department-level Required Courses 6 credits	Department-level Elective Courses 6 credits
<ul style="list-style-type: none"> <li>Academic Ethics(1)</li> <li>Research Boot Camp(1.5)</li> <li>Basic Theory of Commerce and Application(3)</li> <li>Qualitative and Case Study Research Methodology(2)</li> <li>Commercial Applications of Quantitative Method(2)</li> <li>Business Theory Development(1.5)</li> </ul>	<ul style="list-style-type: none"> <li>Strategic Management Theory(3)</li> <li>Business Innovation and Intellectual Property Strategy(3)</li> <li>Development and Applications of Emerging Information Technologies(3)</li> </ul>	<ul style="list-style-type: none"> <li>Case study teaching method; Theory and Practice(3)</li> <li>Seminar on Corporate Diagnosis and Consultant Cases(3)</li> <li>Technology and Innovation Management(3)</li> <li>Smart Electronic Innovation and Transformation(3)</li> </ul>	<ul style="list-style-type: none"> <li>Students may take DBA elective courses offered by the Department, doctoral program courses, or DBA required courses of another department.</li> </ul>

## C. Graduation requirements

### I. Academic Division

#### (I) Information Management Division

<b>Graduation credits</b>	28 credits
<b>Required Courses</b>	17 credits Information Management Research, Advanced Research Methodology, Information Technology Research, Advanced Quantitative Method, Seminar, Academic Ethics, English Proficiency Test Graduation Standards
<b>Elective Courses</b>	11 credits Required and Elective Courses: Students must take at least 9 credits of courses and may only take 6 credits of required and elective courses offered by the same teacher
<b>Qualifying Exam</b>	Oral defense of dissertation

#### (II) Technology Division

<b>Graduation credits</b>	28 credits
<b>Required Courses</b>	17 credits Information Management Research, Advanced Innovative Technology, Advanced Information System Development, Advanced Quantitative Method, Seminar, Academic Ethics, English Proficiency Test Graduation Standards
<b>Elective Courses</b>	11 credits Required and Elective Courses: Students must take at least 9 credits of courses and may only take 6 credits of required and elective courses offered by the same teacher
<b>Qualifying Exam</b>	Oral defense of dissertation

## II. Industry Division

<b>Graduation credits</b>	34 credits
<b>Required Courses</b>	<p>College-level Common Required Courses 13 Credits</p> <p>Academic Ethics, Research Boot Camp, Basic Theory of Commerce and Application, Qualitative and Case Study Research Methodology, Commercial Applications of Quantitative Method, Business Theory Development</p> <p>Department-level Required Courses 6 Credits</p> <p>Technology and Innovation Management, Smart Electronic Innovation and Transformation</p>
<b>Elective Courses</b>	<p>College-level Partially Required Courses 9 Credits</p> <p>Strategic Management Theory, Business Innovation and Intellectual Property Strategy, Development and Applications of Emerging Information Technologies</p> <p>Department-level Elective Courses 6 Credits</p> <p>Students may take DBA elective courses offered by the Department, doctoral program courses, or DBA required courses of another department.</p>
<b>Qualifying Exam</b>	<ol style="list-style-type: none"> <li>1. Qualifying Exam:             <ol style="list-style-type: none"> <li>(1) College-level Qualifying Exam</li> <li>(2) Department-level Qualifying Exam</li> </ol> </li> <li>2. Total points from research paper publications reaches 10 points</li> <li>3. Degree Examination             <ol style="list-style-type: none"> <li>(1) Oral Defense of the Dissertation Proposal</li> <li>(2) Public Speech (Seminar course of the Department's doctoral program)</li> <li>(3) Oral defense of the dissertation</li> </ol> </li> </ol>

**D. Curriculum Planning**

Academic Division - Information Management Division First Semester of First Year					Academic Division - Information Management Division Second Semester of First Year				
Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week	Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week
	※ English proficiency test graduation standards		0	1 hour	300006011	※ Academic Ethics	Friday FGH	1	3 hours
356003001	※ Seminars	Thursday FG	1	1-1.5 hours	356003001	※ Seminars	Thursday FG	1	1-1.5 hours
356005001	※ Information Management Research	Friday D56	3	4.5-6 hours	356007001	※ Advanced Research Methodology	Friday D56	3	4.5-6 hours
356384001	◎ Neural Network and Heuristic Algorithm	Wednesday EFG	3	4.5-6 hours	356009001	※ Information Technology Research	Monday EFG	3	4.5-6 hours
356385001	◎ Ethereum Blockchain and Smart Contracts	Friday EFG	3	4.5-6 hours	356010001	※ Advanced Quantitative Method	Tuesday EFG	3	4.5-6 hours
356386001	◎ Business Innovation Platform Services	Friday D56	3	4.5-6 hours	356387001	◎ Heuristic Algorithm	Wednesday EFG	3	4.5-6 hours
356399001	◎ Artificial Intelligence and Applications	Monday 78E	3	4.5-6 hours	356388001	◎ Financial Trading Strategies and Big Data Analysis	Tuesday EFG	3	4.5-6 hours

356411001	◎ Digital Economy and Industry Coopetition Strategy	Thursday 78E	3	4.5-6 hours	356394001	◎ Blockchain, Ethereum, and Smart Contracts	Wednesday EFG	3	4.5-6 hours
356435001	◎ Supply Chain Management	Friday D56	3	4.5-6 hours	356395001	◎ Pytorch and Machine Learning	Thursday D56	3	4.5-6 hours
356447001	◎ Information Management Theory	Wednesday EFG	3	4.5-6 hours	356461001	◎ Service Science and Service Innovation	Wednesday EFG	3	4.5-6 hours
356511001	◎ E-Commerce, E-Business, and E-Government	Monday EFG	3	4.5-6 hours	356564001	◎ Service Science and Intelligent Technology	Thursday 78E	3	4.5-6 hours
356552001	◎ Discussion on Important Issues of Information Management	Monday D56	3	4.5-6 hours	356808001	◎ Blockchain and Smart Contracts	Tuesday 234	3	4.5-6 hours
356822001	◎ Mobile Commerce and Big Data Management	Friday D56	3	4.5-6 hours	356822001	◎ Mobile Commerce and Big Data Management	Friday D56	3	4.5-6 hours
356825001	◎ Data Mining and Big Data Analysis	Monday EFG	3	4.5-6 hours					

※Required Courses   ◎Elective Courses   V Group courses   △Two-Semester Course

Note: The actual class schedule shall be based on the announcement by the Curriculum Section, Office of Academic Affairs.

Academic Division - Information Management Division First Semester of Second Year					Academic Division - Information Management Division Second Semester of Second Year				
Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week	Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week
356003001	※ Seminars	Thursday FG	1	1-1.5 hours	356003001	※ Seminars	Thursday FG	1	1-1.5 hours

※Required Courses   ©Elective Courses   V Group courses   △Two-Semester Course

Note: The actual class schedule shall be based on the announcement by the Curriculum Section, Office of Academic Affairs.

Academic Division - Technology Division First Semester of First Year					Academic Division - Technology Division Second Semester of First Year				
Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week	Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week
	※ English proficiency test graduation standards		0	1 hour	300006011	※ Academic Ethics	Friday FGH	1	3 hours
356003001	※ Seminars	Thursday FG	1	1-1.5 hours	356003001	※ Seminars	Thursday FG	1	1-1.5 hours
356005001	※ Information Management Research	Friday D56	3	4.5-6 hours	356007001	※ Advanced Research Methodology	Friday D56	3	4.5-6 hours
356015001	※ Advanced Innovative Technology	Wednesday EFG	3	4.5-6 hours	356010001	※ Advanced Quantitative Method	Tuesday EFG	3	4.5-6 hours
356384001	◎ Neural Network and Heuristic Algorithm	Wednesday EFG	3	4.5-6 hours	3560017001	※ Advanced Information System Development	Monday EFG	3	4.5-6 hours
356385001	◎ Ethereum Blockchain and Smart Contracts	Friday EFG	3	4.5-6 hours	356387001	◎ Heuristic Algorithm	Wednesday EFG	3	4.5-6 hours
356386001	◎ Business Innovation Platform Services	Friday D56	3	4.5-6 hours	356388001	◎ Financial Trading Strategies and Big Data Analysis	Tuesday EFG	3	4.5-6 hours
356399001	◎ Artificial Intelligence and Applications	Monday 78E	3	4.5-6 hours	356394001	◎ Blockchain, Ethereum, and Smart Contracts	Wednesday EFG	3	4.5-6 hours

356411001	◎ Digital Economy and Industry Coopetition Strategy	Thursday 78E	3	4.5-6 hours	356395001	◎ Pytorch and Machine Learning	Thursday D56	3	4.5-6 hours
356435001	◎ Supply Chain Management	Friday D56	3	4.5-6 hours	356461001	◎ Service Science and Service Innovation	Wednesday EFG	3	4.5-6 hours
356447001	◎ Information Management Theory	Wednesday EFG	3	4.5-6 hours	356564001	◎ Service Science and Intelligent Technology	Thursday 78E	3	4.5-6 hours
356511001	◎ E-Commerce, E-Business, and E-Government	Monday EFG	3	4.5-6 hours	356808001	◎ Blockchain and Smart Contracts	Tuesday 234	3	4.5-6 hours
356552001	◎ Discussion on Important Issues of Information Management	Monday D56	3	4.5-6 hours	356822001	◎ Mobile Commerce and Big Data Management	Friday D56	3	4.5-6 hours
356822001	◎ Mobile Commerce and Big Data Management	Friday D56	3	4.5-6 hours					
356825001	◎ Data Mining and Big Data Analysis	Monday EFG	3	4.5-6 hours					

※Required Courses ◎Elective Courses V Group courses △Two-Semester Course

Note: The actual class schedule shall be based on the announcement by the Curriculum Section, Office of Academic Affairs.

Academic Division - Technology Division First Semester of Second Year					Academic Division - Technology Division Second Semester of Second Year				
Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week	Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week
356003001	※ Seminars	Thursday FG	1	1-1.5 hours	356003001	※ Seminars	Thursday FG	1	1-1.5 hours

※Required Courses   ©Elective Courses   V Group courses   △Two-Semester Course

Note: The actual class schedule shall be based on the announcement by the Curriculum Section, Office of Academic Affairs.

Industry Division (Early enrollment by one semester)				
Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week
356101001	※ Research Boot Camp	3 days in total 27 hours	1.5	1.5 hours
356102001	※ Basic Theory of Commerce and Application	14 times 54 hours	3	3-6 hours

Industry Division First Semester of First Year					Industry Division First Semester of Second Year				
Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week	Course ID	Course Name	Class time (Temporary)	Credits	Estimated learning time outside of class each week
356103001	※ Qualitative and Case Study Research Methodology	9 times 36 hours	2	5 hours	300006001	※ Academic Ethics	Friday EFG	1	3 hours
356104001	※ Commercial Applications of Quantitative Method	9 times 36 hours	2	4 hours		◎ Strategic Management Theory	14 times 54 hours	3	3-6 hours
356105001	※ Business Theory Development	9 times 36 hours	2	2-4 hours		◎ Business Innovation and Intellectual Property Strategy	14 times 54 hours	3	3-6 hours

※ Required Courses   ◎ Elective Courses   ∨ Group courses   △ Two-Semester Course

Note: The actual class schedule shall be based on the announcement by the Curriculum Section, Office of Academic Affairs.

## E. Overview of Courses

<b>356609001</b>	<b>English proficiency test graduation standards</b>	0 credit	First year and second year doctoral students	0 hour
[Course Objectives]	Improve students' English proficiency and enhance their competitiveness after graduation			
[Course Contents]	(I) TOEFL PBT 550 points or higher. (II) TOEFL CBT 213 points or higher. (III) TOEFL iBT 79 points or higher. (IV) IELTS 6.0 or higher. (V) GEPT high-intermediate second stage or higher. (VI) TOEIC 750 points or higher. (VII) Cambridge Certificate FCE or higher. (VIII) Take 108 hours of English courses at the language center of a public or private university registered with the MOE, receive a score of at least 70 points for each course. Courses must be completed within two years.			
[Remarks]				

<b>356003001</b>	<b>Seminars</b>	1 credit	First year and second year doctoral students	1 hour
[Course Objectives]	It emphasizes the digital integration of relating MIS to Management, the Organization and Technology.			
[Course Contents]	There are ten topics in this class. Following the lecture maker who's decision an arrangement.			
[Remarks]				

<b>356005001</b>	<b>Information Management Research</b>	3 credits	First year doctoral students	3 hours
[Course Objectives]	This course provides perspective and research topics in the challenging and complex world of Information technology management. Major themes will include but not be limited to: Data and Text Mining, Knowledge Representation and Ontology, Intelligent Software Agents, Agent-based Simulation and Soft Computing.			
[Course Contents]	Following project schedule by group planning 1. Introduction 2. Data Mining 3. Text Mining 4. Ontology 5. Intelligent Software Agents 6. Agent-based Simulation			
[Remarks]				

<b>356015001</b>	<b>Advanced Innovative Technology</b>	3 credits	First year doctoral students	3 hours
[Course Objectives]	<p>The course requires the students to discuss and representation in the class. During the course, the students are required to present their progress periodically. At the end of the third semester, each student is required to demonstrate a project as the final outcomes.</p> <p>The student will exercise their knowledge of:</p> <ol style="list-style-type: none"> <li>1. Machine Learning.</li> <li>2. Tensor and PyTorch</li> <li>3. Deep Learning.</li> <li>4. Neural Networks.</li> <li>5. Reinforcement learning.</li> <li>6. Implementation techniques.</li> <li>7. Big data</li> <li>8. Data analysis insights</li> </ol>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Introduction to Natural Language Processing (NLP)</li> <li>2. NLP Techniques</li> <li>3. NLP Techniques</li> <li>4. NLP Techniques</li> <li>5. NLP Techniques</li> <li>6. NLP Techniques</li> <li>7. Getting Started with Deep Learning Using PyTorch</li> <li>8. Building Blocks of Neural Networks</li> <li>9. Diving Deep into Neural Networks</li> <li>10. Fundamentals of Machine Learning</li> <li>11. Deep Learning for Computer Vision</li> <li>12. Deep Learning with Sequence Data and Text</li> <li>13. Generative Networks</li> <li>14. Modern Network Architectures</li> <li>15. Interesting ideas to explore with PyTorch</li> <li>16. Data Analysis Algorithm</li> <li>17. Data Insight</li> <li>18. Project Presentation</li> </ol>			
[Remarks]				

<b>356384001</b>	<b>Neural Network and Heuristic Algorithm</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<ol style="list-style-type: none"> <li>1. Introduce the ideas and applications of metaheuristics: population-based metaheuristics, single-solution-based metaheuristics, and hybrid metaheuristics.</li> <li>2. Thorough review the applications of metaheuristics to develop effective FNNs.</li> <li>3. Develop novel approaches to apply metaheuristics to develop effective FNNs.</li> </ol>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Population-based Metaheuristics</li> <li>2. Population-based Metaheuristics</li> <li>3. Single-solution-based Metaheuristics</li> <li>4. Hybrid Metaheuristics</li> <li>5. Metaheuristic Design of Artificial Neural Networks</li> <li>6. Weight Optimization of ANN</li> <li>7. Weight Optimization of ANN</li> <li>8. Input Layer Optimization of ANN</li> <li>9. Learning Algorithm Optimization of ANN</li> <li>10. Architecture Optimization of ANN</li> </ol>			

	11. Architecture and Weight Optimization of ANN 12. Architecture and Weight Optimization of ANN 13. Input Layer, Architecture and Weight Optimization of ANN
[Remarks]	

<b>356385001</b>	<b>Ethereum Blockchain and Smart Contracts</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<p>This course concentrates on Blockchain, Ethereum and Smart Contracts. The course requires the students to discuss and represent in the class. During the course, the students are required to present their progress periodically. At the end of the semester, each student is required to demonstrate a project as the final outcomes.</p> <p>The students will exercise their knowledge of:</p> <ul style="list-style-type: none"> <li>• Blockchain.</li> <li>• Ethereum</li> <li>• Smart Contracts</li> <li>• Solidity</li> <li>• Web3.js</li> <li>• IoT Blockchain</li> <li>• Enterprise- and Consortium-Level Smart Contracts</li> </ul>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Blockchain 101</li> <li>2. Blockchain Basics</li> <li>3. Understanding Decentralized Applications(DApps) and DAO</li> <li>4. Ethereum</li> <li>5. Ethereum 101</li> <li>6. Basic Smart Contracts</li> <li>7. Advanced Smart Contracts</li> <li>8. Web3.js</li> <li>9. Ethereum Development Environment</li> <li>10. Development Tools and Solidity</li> <li>11. Further Ethereum Programming languages</li> <li>12. Wallet Service and Cryptocurrency</li> <li>13. Building a Betting App</li> <li>14. Enterprise Level Smart Contracts</li> <li>15. Outside of Currencies and BaaS</li> <li>16. Consortium Blockchain</li> </ol>			
[Remarks]				

<b>356386001</b>	<b>Business Innovation Platform Services</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<p>This course tends to achieve following objectives:</p> <ul style="list-style-type: none"> <li>• Students can learn EIP related theories in a mutual environment</li> <li>• Students can be familiar with EIP through a series of case studies</li> <li>• Students can gain practical implications of EIP from companies visits</li> <li>• Students can learn EIP knowledge from various kinds of teaching activities</li> </ul>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Introduction to EIP</li> <li>2. Business model of platforms</li> <li>3. Business innovation</li> <li>4. Paper Report 1</li> <li>5. Platform transformation and innovation</li> <li>6. Paper Report 2</li> <li>7. Sharing economy of platforms</li> </ol>			

	8. Paper Report 3 9. Big data platform establishment 10. e-Commerce platform practices 11. Social networking platform operation 12. Industry 4.0 platform 13. Innovation and change management 14. Platform solution development
[Remarks]	

<b>356399001</b>	<b>Artificial Intelligence and Applications</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	The course objectives are the in-depth discussions on issues regarding the artificial Neural Networks on the infrastructure of Tensorflow and GPU and the applications. Particularly, we will study the language Tensorflow that enables its programs performing parallel computations on GPU. Students will learn from the practice implementation on artificial neural networks techniques. At the end of this course, students should gain: (1) the general knowledge on artificial neural networks methodologies, algorithms and implementation, and (2) the hands-on system development experience on programs with Tensorflow and GPU.			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Image classification pipeline</li> <li>2. Loss function and Optimization</li> <li>3. Backpropagation and Neural Networks</li> <li>4. Convolutional Neural Networks</li> <li>5. Training Neural Networks</li> <li>6. Deep Learning Software</li> <li>7. Recurrence Neural Networks</li> <li>8. Detection and Segmentation</li> <li>9. Visualizing and understanding</li> <li>10. Generative Model</li> <li>11. Reinforcement Learning</li> <li>12. Introduction to Softening Learning Algorithm</li> <li>13. The implementation of Softening Learning algorithm via Tensorflow</li> <li>14. Introduction to Reasoning Neural Networks</li> <li>15. The implementation of Reasoning Neural Networks via Tensorflow</li> </ol>			
[Remarks]				

<b>356411001</b>	<b>Digital Economy and Industry Coopetition Strategy</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	The goals & Learning outcomes are to enhance the students the following capabilities of Digital Economy & IT Business Strategies: IT Business-related problem analysis, solving, and decision-making ability, Operations management and innovation application ability, Integration and master of new IT technologies and applications ability, and International communication and coordination ability.			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Digital Economy</li> <li>2. Nexus and Social Networks</li> <li>3. Co-opetion Strategies</li> <li>4. Platform Revolution</li> <li>5. Digital Economy</li> <li>6. Case study &amp; workshop</li> <li>7. Nexus and Social Networks Case study &amp; workshop</li> <li>8. Co-opetion Strategies</li> </ol>			
[Remarks]				

<b>356435001</b>	<b>Supply Chain Management</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	This is an introductory graduate course to supply chain management. The topics covered include the concepts, strategies, fundamental models and information systems of supply chain management.			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Introduction to Logistics Management and Supply Chain Management</li> <li>2. Inbound Logistics</li> <li>3. Deferred Moon Festival Holiday</li> <li>4. Long-term Production Logistics (APP, MPS) and Mid-term Production Logistics (MRP, CRP)</li> <li>5. Short-term Production Logistics (SFC)</li> <li>6. Outbound Logistics for Sales and Order Management</li> <li>7. Outbound Logistics for Distribution and Shipment Management</li> <li>8. Cases Presentation</li> <li>9. Reverse Logistics and Green Supply Chains</li> <li>10. Advanced Planning and Scheduling Systems</li> <li>11. System Development and Performance Measurement in Supply Chains</li> <li>12. Reading Assignment</li> <li>13. Final Project</li> </ol>			
[Remarks]				

<b>356447001</b>	<b>Information Management Theory</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	The objective of this course is to help students learn information management related theories, understand how to build the research structure of a study through the review of literature and theories.			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. Role of Theory in Information Systems Research</li> <li>3. Theories of Individual Adoption</li> <li>4. Theories of Organizational Adoption</li> <li>5. Theories of Social Interaction</li> <li>6. Theories of System Success</li> <li>7. Theories of Systems Design</li> <li>8. Development and Evaluation of Theories</li> <li>9. Development of New Theories</li> <li>10. Term report</li> </ol>			
[Remarks]				

<b>356511001</b>	<b>E-Commerce, E-Business, and E-Government</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	To introduce and discuss topics and issues with respect to Electronic Commerce (EC), Electronic Business (EB), and Electronic Government (EG) domains, including concepts and methodologies, frameworks and models, services and systems, strategic management and performance measurement, as well as practical cases and application management.			
[Course Contents]	<p>Class Schedule</p> <ol style="list-style-type: none"> <li>1. General overview</li> <li>2. Characteristics, services, systems frameworks, and technical/managerial issues of EC,EB,and EB.</li> <li>3. Business models (BMs) for e-Business and e-Government</li> <li>4. Strategic management and performance measurement-methodologies</li> <li>5. BM oriented value management</li> <li>6. BM oriented strategic management</li> <li>7. BM oriented performance measurement</li> <li>8. The integration of BM and the BSC</li> <li>9. BM oriented EB and EG related case studies</li> <li>10. Mid-term case reports-I</li> <li>11. Mid-term case reports-II</li> <li>12. Integrated service oriented architecture for EB and EG</li> <li>13. E-tourism, E-healthcare, E-shopping</li> <li>14. E-tax, E-investment, E-learning</li> <li>15. Final subject reports</li> </ol>			
[Remarks]				

<b>356552001</b>	<b>Discussion on Important Issues of Information Management</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<ol style="list-style-type: none"> <li>1. Students should know important issues in information management that typical Taiwanese enterprises are concerned about.</li> <li>2. Students should know how to independently search online and other books to understand and collect information on the information management theories and practices involved in cases that are introduced in class.</li> <li>3. Students should know how to make conclusions, explain, and ask questions worth discussing for short cases.</li> <li>4. Students should independently find cases with important issues in information management they are concerned about, give a simple description, and ask questions that should be discussed.</li> </ol>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. E-Commerce, Innovation Management</li> <li>2. Customer relationship management</li> <li>3. Business process change</li> <li>4. Personal information protection</li> <li>5. Online marketing, media promotion</li> <li>6. E-commerce, online marketing</li> <li>7. Innovation management</li> <li>8. O2O</li> <li>9. E-Government, open data</li> <li>10. Innovation management, management of cultural and creative industries</li> <li>11. E-commerce, handling errors, enterprise resource planning</li> <li>12. E-commerce, innovation management, travel management</li> <li>13. Remote backup, crisis management, information system auditing</li> <li>14. Medical management</li> <li>15. individual-raised key issues</li> </ol>			
[Remarks]				

<b>356822001</b>	<b>Mobile Commerce and Big Data Management</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	The strategic content of the course will feature a broad review of significant management challenges before assessing value of mobile commerce and big data applications through case studies and empirical research articles. The tactical content will focus on a triad which gives a basic foundation in IT including digital commerce, IT startup challenges, and specific skills in managing big data projects.			
[Course Contents]	<p>The course material will be drawn from textbooks as well as recent research literatures. The course will focus on mobile communications, monetizing mobile audiences, viewability of mobile performance, mobile security, mobile payment and location-sensitive services, future m-commerce services and business models, telematics, and pervasive computing.</p> <p>It will also focus on data mining and machine learning algorithms for analyzing large amounts of data. Map Reduce and No SQL system will be introduced as tools/standards for creating parallel algorithms that can process very large amounts of data.</p>			
[Remarks]				

<b>356825001</b>	<b>Data Mining and Big Data Analysis</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<p>This course would incubate students with the ability of data mining and big data analytics to solve business problems.</p> <p>The course also covers financial data analysis currently used by institutional traders or VIP investors, using SYSTEX software and database, in order to investigate the potential</p>			

	of big data analytics in practical financial application.
[Course Contents]	<ol style="list-style-type: none"> <li>1. Data Mining Using SAS Enterprise Miner:</li> <li>2. Association Rules</li> <li>3. Decision Tree</li> <li>4. Clustering Analysis</li> <li>5. Logistic Regression Analysis</li> <li>6. Neuron Network</li> <li>7. Text Mining</li> <li>8. Data Analysis using SAS Enterprise Guide</li> <li>9. Data Analysis using SAS Visual Analytics</li> <li>10. Financial Data Analysis Using SYSTEX-DQ2</li> <li>11. Financial Data Analysis Using SYSTEX-eMIDST</li> <li>12. Literature Review and Discussion</li> </ol>
[Remarks]	

<b>300006011</b>	<b>Academic Ethics</b>	1 credit	First year and second year doctoral students	1 hour
[Course Objectives]	By teaching business ethics concepts and academic ethics principles, this course aims to cultivate academic talent with the ability to determine value, and attaches importance to the spirit of business ethics and principles of research ethics. As a result, doctoral students will be able to implement ethical concepts in their field of expertise when they become teachers of business administration in the future. It will strengthen the elements of business ethics in teaching contents and cause the students to uphold academic ethics when engaging in research.			
[Course Contents]	Contents of this course cover two aspects: Business ethics and academic ethics. Aspects of business ethics include ethical dialectical training, introduction to theories of ethics, business ethics case analysis and discussion, and sustainability activities. Academic ethics includes guidelines for writing academic papers and citation and quotation, principles and procedures for reviewing research ethics in social sciences, and application for and regulations on MOST projects.			
[Remarks]				

<b>356007001</b>	<b>Advanced Research Methodology</b>	3 credits	First year doctoral students	3 hours
[Course Objectives]	<ol style="list-style-type: none"> <li>1. Bibliometrics, Scientometrics and Information metrology</li> <li>2. Growing phenomenon of literature</li> <li>3. Bradford's law</li> <li>4. Loka's Law and author productivity</li> <li>5. Zipf's Law</li> <li>6. Citation analysis and reference Motivation</li> <li>7. Citation content analysis</li> <li>8. Science citation index, Journal Citation Reports and Journal evaluation criteria</li> <li>9. Information and network metrology metrology</li> </ol>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Bibliometrics, Scientometrics and Information metrology</li> <li>2. Growing phenomenon of literature</li> <li>3. Bradford's law.Loka's Law and author productivity.Zipf's Law</li> <li>4. Citation analysis and reference Motivation</li> <li>5. Citation content analysis</li> <li>6. Science citation index, Journal Citation Reports and Journal evaluation criteria</li> <li>7. Information and network metrology metrology</li> </ol>			
[Remarks]				

<b>356009001</b>	<b>Information Technology Research</b>	3 credits	First year doctoral students	3 hours
[Course Objectives]	The course aims to provide a broad coverage of advanced information technologies for digital enterprises in the era of the knowledge economy, and introduce the design research in IS about the development of IT artifacts. The topics include IS design framework and theory, followed by a slew of modern IT technologies and their central underlying concepts, along with the discussion of their functional and industrial information systems. The IT technologies and concepts include Electronic Commerce, Ubiquitous Commerce, Internet of Things, Big Data, Social Network, Cloud Service, User Interface, Data Security Trend.			
[Course Contents]	IS Design Theory 1. Advances in e-Commerce & e-Selling & Omni-Channel Commerce 2. Internet of Things 3. Mobile Analytics 4. Big Data 5. Social Network 6. Smart User Interface 7. Group IS Design Research Project			
[Remarks]				

<b>356010001</b>	<b>Advanced Quantitative Method</b>	3 credits	First year doctoral students	3 hours
[Course Objectives]	1. Introducing the ideas and applications of current optimization methods: evolutionary algorithms, simulated annealing, tabu search, particle swarm optimization, ant colony optimization. 2. Exploring the opportunities for applying these optimization methods to problems in MIS fields.			
[Course Contents]	1. Introduction to Quantitative Methods 2. Genetic Algorithms 3. Evolution Strategies 4. Genetic Programming 5. Simulated Annealing 6. Tabu Search 7. Particle Swamp Optimization 8. Ant Colony Optimization			
[Remarks]				

<b>356017001</b>	<b>Advanced Information System Development</b>	3 credits	First year doctoral students	3 hours
[Course Objectives]	Students should be familiar with the following topics. The main topics include but not limited to: 1. Understand the relationship between Security and Security Management. 2. Understand the concept of detection, the profiling subject, profiling techniques, misuse detection, and anomaly detection. 3. Familiar with data analysis environment, big data concept, and cloud computing. 4. Understand the data analysis algorithms: distance, similarity, classification, clustering for security application 5. Understand visualized machine learning tools: Orange 6. Understand the operation of security-related information systems from the perspective of the data-driven system: intrusion detection system, anomaly detection system, spam mail filter system and sequence analysis system.			
[Course Contents]	1. Text Mining 2. Security Management			

	<ol style="list-style-type: none"> <li>3. Data Analysis Environment</li> <li>4. Data Analysis Algorithm I: supervised learning</li> <li>5. Data Analysis Algorithm II: unsupervised learning</li> <li>6. Visualized Machine Learning Tool: Orange</li> <li>7. Intrusion Detection System</li> <li>8. Anomaly Detection on Netflow System</li> <li>9. Spam Mail Filtering System</li> <li>10. Sequence Analysis System</li> <li>11. Project Presentation</li> </ol>
[Remarks]	

<b>356387001</b>	<b>Heuristic Algorithm</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<ol style="list-style-type: none"> <li>1. Introducing the ideas and applications of metaheuristics: Simulated annealing, Tabu search, Genetic Algorithms, Evolution Strategies, Genetic Programming, Ant Colony Optimization and Particle swarm optimization.</li> <li>2. Exploring the opportunities for applying these metaheuristics to problems in MIS fields</li> </ol>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Common Concepts for Metaheuristics</li> <li>2. Single-Solution Based Metaheuristics: Simulated Annealing (SA)</li> <li>3. Single-Solution Based Metaheuristics: Tabu Search (TS)</li> <li>4. Single-Solution Based Metaheuristics: Iterated Local Search (ILS)</li> <li>5. Population-Based Metaheuristics: Genetic Algorithms (GA)</li> <li>6. Population-Based Metaheuristics: Evolution Strategies (ES)</li> <li>7. Population-Based Metaheuristics: Genetic Programming (GP)</li> <li>8. Population-Based Metaheuristics: Ant Colony Optimization (ACO)</li> <li>9. Population-Based Metaheuristics: Particle Swarm Optimization (PSO)</li> </ol>			
[Remarks]				

<b>356388001</b>	<b>Financial Trading Strategies and Big Data Analysis</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	This course incubates students with the ability of financial trading strategy and big data analytics, especially using natural language processing and machine learning tools.			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Trading Strategy</li> <li>2. Lab on Trading Strategy</li> <li>3. Application on Trading Strategy</li> <li>4. Data Analysis Project</li> <li>5. Web Crawling and Tools</li> <li>6. Text Analysis and NLP</li> <li>7. Lab on SAS VA, Web Crawling</li> </ol>			
[Remarks]				

<b>356394001</b>	<b>Blockchain, Ethereum, and Smart Contracts</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<p>This course concentrates on Blockchain, Ethereum and Smart Contracts. The course requires the students to discuss and represent in the class. During the course, the students are required to present their progress periodically. At the end of the semester, each student is required to demonstrate a project as the final outcomes. The students will exercise their knowledge of:</p> <ul style="list-style-type: none"> <li>• Blockchain.</li> <li>• Ethereum</li> <li>• Smart Contracts</li> </ul>			

	<ul style="list-style-type: none"> <li>• Solidity</li> <li>• Web3.js</li> <li>• IoT Blockchain</li> <li>• Enterprise- and Consortium-Level Smart Contracts</li> </ul>
[Course Contents]	<ol style="list-style-type: none"> <li>1. Blockchain Basics</li> <li>2. Blockchain 101</li> <li>3. Understanding Decentralized Applications(DApps) and DAO</li> <li>4. Ethereum</li> <li>5. Ethereum 101</li> <li>6. Basic Smart Contracts</li> <li>7. Advanced Smart Contracts</li> <li>8. Web3.js</li> <li>9. Ethereum Development Environment</li> <li>10. Development Tools and Solidity</li> <li>11. Further Ethereum Programming languages</li> <li>12. Wallet Service and Cryptocurrency</li> <li>13. Building a Betting App</li> <li>14. Enterprise Level Smart Contracts</li> <li>15. Outside of Currencies and BaaS</li> <li>16. Consortium Blockchain</li> </ol>
[Remarks]	

<b>356395001</b>	<b>Pytorch and Machine Learning</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<p>The course requires the students to discuss and present in the class. During the course, the students are required to present their progress periodically. At the end of the semester, each student is required to demonstrate a project as the final outcomes.</p> <p>The student will exercise their knowledge of:</p> <ul style="list-style-type: none"> <li>• Machine Learning.</li> <li>• Tensor and PyTorch</li> <li>• Deep Learning.</li> <li>• Recurrent Neural Networks (RNN)</li> <li>• Generative Networks (GAN)</li> <li>• Convolutional Neural Networks (CNN)</li> <li>• Implementation techniques</li> </ul>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. PyTorch from 1 Mile Away</li> <li>2. Getting Started with Deep Learning Using PyTorch</li> <li>3. A Whirlwind Tour of PyTorch</li> <li>4. It Starts with a Tensor</li> <li>5. The World as Tensors</li> <li>6. Building Blocks of Neural Networks</li> <li>7. Diving Deep into Neural Networks</li> <li>8. Fundamentals of Machine Learning</li> <li>9. The Mechanics of Learning</li> <li>10. Deep Learning for Computer Vision(CNN)</li> <li>11. Deep Learning with Sequence Data and Text(RNN)</li> <li>12. Generative Networks (GAN)</li> <li>13. Modern Network Architectures</li> <li>14. Interesting ideas to explore with PyTorch</li> <li>15. Data Analysis Algorithm</li> <li>16. Real-life cases and discussion</li> </ol>			
[Remarks]				

<b>356461001</b>	<b>Service Science and Service Innovation</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<ol style="list-style-type: none"> <li>1. Understand the nature of service science and service innovation</li> <li>2. Analyze service contents and processes</li> <li>3. Understand developments of information technology in service innovation</li> <li>4. Use information technology to find opportunities for service innovation</li> <li>5. Evaluate the feasibility of service innovation</li> </ol>			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Knowledge economy and technology innovation</li> <li>2. Service science and service innovation model</li> <li>3. The nature and method of innovation</li> <li>4. Service innovation driven by information technology</li> <li>5. Customer analysis and customer service innovation</li> <li>6. Product and brand innovation</li> <li>7. Service process analysis and re-engineering</li> <li>8. Management and application of service knowledge</li> <li>9. Service quality management</li> <li>10. Information technology and service innovation in different industries</li> <li>11. Limitations of service innovation and future direction for innovation</li> </ol>			
[Remarks]				

<b>356564001</b>	<b>Service Science and Intelligent Technology</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	The goals & Learning outcomes are to enhance the students the following capabilities of Service Science & Intelligent Technology: IT-related problem analysis, solving, and decision-making ability, Operations management and innovation application ability, Integration and master of new IT technologies and applications ability, and International communication and coordination ability.			
[Course Contents]	<ol style="list-style-type: none"> <li>1. Service Science</li> <li>2. Data Mining</li> <li>3. Text Mining</li> <li>4. Big Data</li> <li>5. Machine Learnin</li> <li>6. Block Chain</li> <li>7. Informatrics</li> </ol>			
[Remarks]				

<b>356808001</b>	<b>Blockchain and Smart Contracts</b>	3 credits	First year and second year doctoral students	3 hours
[Course Objectives]	<p>This course covers several topics, such as FinTech and digital currency, blockchain and Bitcoin, smart contract and Ethereum, and Internet of Things. The course objective is to comprehend the theory behind blockchain and smart contract (in order to understand the limitation and applicable scenario of blockchain and smart contract), and to be able to design a new blockchain or smart contract based application. The main topics includes but not limited to:</p> <p>The history and application of FinTech and digital currency  Hashcash, distributed consensus and proof-of-work  Design, analysis and implementation of blockchain  Underlying technique of blockchain: cryptography and virtual machine</p>			

	Design, analysis and implementation of smart contract Create private blockchain and smart contract IoT and smart contract Case study Security issue
[Course Contents]	<ol style="list-style-type: none"> <li>1. FinTech and Digital Currency</li> <li>2. Blockchain and Case Studies</li> <li>3. Bitcoin and Transaction</li> <li>4. Bitcoin Script Language</li> <li>5. Bitcoin Network</li> <li>6. Private Blockchain</li> <li>7. Smart Contract</li> <li>8. Ethereum and its smart contract Language</li> <li>9. Private Smart Contract</li> <li>10. Security and Management</li> <li>11. Other security problems and blockchains</li> </ol>
[Remarks]	

※ The above are only examples, and all course contents must be included when prepared by each unit.

**F. Course Checklist**

<b>College of Commerce, National Chengchi University</b> <b>Department of Management Information Systems Doctoral Program Academic Division -</b> <b>Information Management Division (28 graduation credits)</b>							
<b>Name:</b> _____ <b>Student No.:</b> _____							
Required Courses (17 credits)				Elective Courses in the Department			
Course Name	Credits	Score		Course Name	Credits	Score	
1. Information Management Research	3	_____	<input type="checkbox"/>	1. _____	3	_____	<input type="checkbox"/>
2. Advanced Research Methodology	3	_____	<input type="checkbox"/>	2. _____	3	_____	<input type="checkbox"/>
3. Information Technology Research	3	_____	<input type="checkbox"/>	3. _____	2	_____	<input type="checkbox"/>
4. Advanced Quantitative Method	3	_____	<input type="checkbox"/>	4. _____	3	_____	<input type="checkbox"/>
5. Seminars	4	_____	<input type="checkbox"/>	5. _____	3	_____	<input type="checkbox"/>
6. Academic Ethics	1	_____	<input type="checkbox"/>	6. _____	3	_____	<input type="checkbox"/>
7. English proficiency test graduation standards	0	_____	<input type="checkbox"/>	<b>Elective courses of other departments (at least 3 credits)</b>			
				Course Name	Credits	Score	
				1. _____	_____	_____	<input type="checkbox"/>
				2. _____	_____	_____	<input type="checkbox"/>
				3. _____	_____	_____	<input type="checkbox"/>
				4. _____	_____	_____	<input type="checkbox"/>

**Total credits: 28 credits**

**College of Commerce, National Chengchi University**

**Department of Management Information Systems Doctoral Program Academic Division -  
Technology Division (28 graduation credits)**

Name: \_\_\_\_\_

Student No.: \_\_\_\_\_

Required Courses (17 credits)				Elective Courses in the Department			
Course Name	Credits	Score		Course Name	Credits	Score	
1. Information Management Research	3	_____	<input type="checkbox"/>	1. _____	3	_____	<input type="checkbox"/>
2. Advanced Innovative Technology	3	_____	<input type="checkbox"/>	2. _____	3	_____	<input type="checkbox"/>
3. Advanced Information System Development	3	_____	<input type="checkbox"/>	3. _____	2	_____	<input type="checkbox"/>
4. Advanced Quantitative Method	3	_____	<input type="checkbox"/>	4. _____	3	_____	<input type="checkbox"/>
5. Seminars	4	_____	<input type="checkbox"/>	5. _____	3	_____	<input type="checkbox"/>
6. Academic Ethics	1	_____	<input type="checkbox"/>	6. _____	3	_____	<input type="checkbox"/>
7. English proficiency test graduation standards	0	_____	<input type="checkbox"/>	<b>Elective courses of other departments (at least 3 credits)</b>			
				Course Name	Credits	Score	
				1. _____	_____	_____	<input type="checkbox"/>
				2. _____	_____	_____	<input type="checkbox"/>
				3. _____	_____	_____	<input type="checkbox"/>
				4. _____	_____	_____	<input type="checkbox"/>

**Total credits: 28 credits**

**National Chengchi University College of Commerce Department of Management Information Systems Study Plan**

**Doctoral program** (Contents of the table may be added or deleted as needed)

Name: \_\_\_\_\_

Student No.: \_\_\_\_\_

First year /  Second year

First Semester				Second Semester			
Course Name	Class time	Required/ Elective	Semester Credits	Course Name	Class time	Required/ Elective	Semester Credits
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____	_____	_____	Required <input type="checkbox"/> Elective <input type="checkbox"/>	_____
<b>Total:</b>							

## College of Commerce Faculty Members

Name	Title	Highest degree	Expertise	Department
Shang Shiaw-Chun	Professor and Department Chair	Ph.D. in Information Systems, University of Melbourne	Business Innovation, Enterprise Systems, Business Process Management, Change Management	Department of Management Information Systems, College of Commerce
Liang Ting- Peng	Chair Professor	Wharton School, University of Pennsylvania Ph.D. in Decision Sciences	E-Commerce, Knowledge Management, Information Management, Service Science	Department of Management Information Systems, College of Commerce
Lin Woo- Tsong	Professor	University of California, Berkeley Ph.D. in Industrial Engineering	Supply Chain Management, Supply Chain Innovation, E- Business, Decision Support Systems, Software Industry Development and Management	Department of Management Information Systems, College of Commerce
Tang Tzung-I	Professor	Mississippi State University Business Information System and Quantitative Analyses Ph.D.	Digital Technology Competitiveness, Telecommunication Policy, New Media Competitiveness, Digital Thinking Model	Department of Management Information Systems, College of Commerce
Tsaih Rua- Huan	Professor	University of California, Berkeley Industrial Engineering and Operations Research Ph.D.	IT-enabled Service, Service Innovation, Digital Humanities, Artificial Neural Networks, Business Process Analysis	Department of Management Information Systems, College of Commerce
Yang Heng- Li	Professor	Ph.D., Department of Management Information Systems,	Information Management, E- Commerce,	Department of Management Information

<b>Name</b>	<b>Title</b>	<b>Highest degree</b>	<b>Expertise</b>	<b>Department</b>
		University of British Columbia	Knowledge Management, Innovative Services, System Development	Systems, College of Commerce
Chen Chuen-Lung	Professor	PhD, Department of Industrial and Systems Engineering, Auburn University	Production and Operations Management, Applied Operations Research, Advanced Scheduling	Department of Management Information Systems, College of Commerce
Chen Kung	Professor	Computer Science, Yale University Ph.D.	Blockchain and Smart Contracts, Programming Language and Software Engineering	Department of Management Information Systems, College of Commerce
Lee Hsiao-Hui	Professor	Simon Business School, University of Rochester Ph.D.	Empirical Operations Management, Supply Chain Management, and Innovation and Sustainability, Service Operations Management, Health Care Operations	Department of Management Information Systems, College of Commerce
Hung Wei-Hsi	Professor	Systems Management, University of Waikato Ph.D.	Technology Strategy, E-Commerce, IoT Applications, Information Security Management, Text Mining	Department of Management Information Systems, College of Commerce
Chyou Jiin-Tian	Associate Professor	Ph.D. in Educational Technology, University of Georgia	Multimedia Application Design, E-Learning, E-Commerce,	Department of Management Information Systems, College of Commerce

<b>Name</b>	<b>Title</b>	<b>Highest degree</b>	<b>Expertise</b>	<b>Department</b>
			Knowledge Management	
Tseng Shu-Feng	Associate Professor	Ph.D., Department of Business Analysis and Research, Texas A&M University	Software Framework and System Development, E-Commerce and Financial Application, Business Intelligence and Data Mining	Department of Management Information Systems, College of Commerce
Chiang Kuo-Huie	Associate Professor	Ph.D. in Engineering Science, RWTH University of Aachen	Production Information Management, Business Intelligence Mobile Cloud Computing, Computing Intelligence, Semantic Network	Department of Management Information Systems, College of Commerce
Chang Hsin-Lu	Associate Professor	University of Illinois at Urbana Champaign Department of Management Information Systems Ph.D.	E-Commerce, IT Value, Supply Chain Management, IT Standard, Service Science	Department of Management Information Systems, College of Commerce
Yu Fang	Associate Professor	University of California, Santa Barbara Ph.D. in Computer Science	Software Security, Cloud Computing, IoT and Big Data Analysis	Department of Management Information Systems, College of Commerce

<b>Name</b>	<b>Title</b>	<b>Highest degree</b>	<b>Expertise</b>	<b>Department</b>
Chou Yen-Chun	Associate Professor	Arizona State University Department of Management Information Systems Ph.D.	E.Commerce, Service Science, Empirical and Econometric Analysis	Department of Management Information Systems, College of Commerce
Chuang Hao-Chun	Associate Professor	PhD in Information and Operations Management, Texas A&M University	Retail and Services Operations, Data and Decision Analysis, Supply Chain Management, System Dynamics	Department of Management Information Systems, College of Commerce
Tu Yu-Ju	Assistant Professor	University of Illinois at Urbana Champaign Ph.D. in Business Administration	Information management	Department of Management Information Systems, College of Commerce
Lin Yi-Ling	Assistant Professor	Department of Computer Science, University of Pittsburgh Ph.D.	Human-Machine Interaction, Information Retrieval, Text Mining, Social Network	Department of Management Information Systems, College of Commerce
Hsiao Shun-Wen	Assistant Professor	Ph.D. in Management Information Systems, National Taiwan University	Computer Network, Information Security, Cloud Computing, Operating Systems	Department of Management Information Systems, College of Commerce
Chien Shih-Yi	Assistant Professor	University of Pittsburgh Ph.D. in Computer Science	Human-automation collaboration Human-robot interaction Technology Acceptance Human Factors in Systems User Experience	Department of Management Information Systems, College of Commerce
Peng Chih-Hung	Assistant Professor	Ph.D. in Information Technology Management, Georgia Institute of Technology	Group Decision Making Strategy Management and Organizational	Department of Management Information Systems, College

<b>Name</b>	<b>Title</b>	<b>Highest degree</b>	<b>Expertise</b>	<b>Department</b>
			Performance E-commerce	of Commerce
Yu Chien-Chih	Adjunct Professor	University of Texas at Austin Industrial Engineering and Operations Research Ph.D.	E-Commerce, E-Government, Smart Decision Support, Hypermedia System, Project Management, Performance Evaluation	Department of Management Information Systems, College of Commerce
Yang Jiann-Min	Adjunct Professor	Management Science, University of Texas Ph.D.	Information Management, E-Commerce, Operating Model Innovation, Informetrics and Mining, Coopetition Strategy and Social Capital	Department of Management Information Systems, College of Commerce
Chang Jiing-Yao	Adjunct Assistant Professor	Ph.D. in Management Information Systems, National Chengchi University	Windows Programming, IT Fundamentals, Ethical Hacker, Data Structures, Business Data Communications	Department of Management Information Systems, College of Commerce
Yu Jiun-Yu	Adjunct Assistant Professor	Applied Statistics, University of Oxford Ph.D.	Applications of Business Analytics, System Dynamics, Operational Research, and Simulation in Healthcare Services Business Model and Service Innovation for Healthcare Service Design / Service Innovation	Department of Management Information Systems, College of Commerce

國立政治大學 商學院

National Chengchi University  
College of Commerce

