109/1 Courses taught in English(109 學年度第 1 學期全英文授課課程表)

No. 編號	Department 開課系所	Course Code 課號	Course Title 科目名稱	Required/ Elective 必修/選修	Credit Points 學分數	Instructor 授課老師	Course Description 課程說明
1	Institute of Mechanical and Computer-Aided Engineering(機械與電腦輔助工程系碩士班)	0010	Special Topics on Metal Forming (金屬成形特論)	Elective 選修	3	Li-Wei, Chen 陳立緯	Course Outline
2	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2513	Biosolid Mechanics （生物力學）	Elective 選修	3	Samuel I-En, Lin 林依恩	Course Outline
3	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2515	Friction Engineering （摩擦工程）	Elective 選修	3	Jeng-Haur Horng 洪政豪	Course Outline
4	Graduate Institute of Materials Science and Green Energy Engineering (材料科學與工程系材料科學與綠色能源工程碩士班)	0226	Thermodynamics of Solids （固態熱力學）	Required 必修	3	Chau-Yi, Tsai 蔡朝伊	Course Outline
5	Graduate Institute of Materials Science and Green	0234	Semiconductor Devices and Manufacturing Process	Elective 選修	3	Jau-Shiung, Fang	Course Outline

	Energy Engineering (材料科學與工程系材料科學與綠色能源工程碩士班)		（半導體元件與製程）			方昭訓	
6	Institute of Automation Engineering(自動化工程系碩士班)	0054	Autonomous Unmanned Vehicle System （自動化無人載具系統）	Elective 選修	3	Meng-Tse, Lee 李孟澤	Course Outline
7	Institute of Automation Engineering(自動化工程系碩士班)	0053	Application for Digital Image （數位影像處理實務）	Elective 選修	3	Kuang-Chyi, Lee 李廣齊	Course Outline
8	Institute of Electrical Engineering (電機工程系碩士班)	0144	FPGA Circuits Design （FPGA 電路設計）	Elective 選修	3	Chi-Chia, Sun 宋啟嘉	Course Outline
9	Institute of Electrical Engineering (電機工程系碩士班)	0148	Embedded Systems （嵌入式系統）	Elective 選修	3	Hui-Kai, Su 蘇暉凱	Course Outline
10	Institute of Computer Science and Information Engineering (資訊工程系碩士班)	0136	Intelligent Optimization Algorithm (智慧型最佳化演算法)	Elective 選修	3	Jin-Tsong, Jeng 鄭錦聰	Course Outline
11	Institute of Computer Science and Information Engineering (資訊工程系碩士班)	0127	Technical Research Writing （科技論文寫作）	Required 必修	3	Po-Hsiang, Tsai 蔡柏祥	Course Outline
12	Master program of Business Management of Department	0349	Marketing Management (行銷管理)	Elective 選修	3	Mam-Shin, Cheng	Course Outline

	of Business administration (企業管理系經營管理碩士班)					鄭錳新	
13	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0352	Business Data Analysis (企業資料分析)	Elective 選修	3	Chih-Chin, Liang 梁直青	Course Outline
14	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0350	Corporate Financial Management (公司財務管理)	Elective 選修	3	Chi-Lin, Lu 呂麒麟	Course Outline
15	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0365	Global Marketing (全球化行銷)	Elective 選修	3	Yi Hsu 徐怡	Course Outline
16	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0366	Entrepreneurial Management (創業管理)	Elective 選修	3	Yu-Chun, Chen 陳鈺淳	Course Outline
17	Master program of Business Management of Department	2513	Motivation and Leadership (激勵與領導)	Elective 選修	3	Ching-Hsiang Liu	Course Outline

	of Business administration (企業管理系經營管理碩士班)					劉慶湘	
18	Institute of Department of Finance(財務金融系碩士班)	0038	Financial Statement Analysis (財務報表分析)	Elective 選修	3	Tsai Feng-Tse 蔡豐澤	Course Outline
19	Institute of Industrial Engineering and Management (工業管理系工業工程與管理碩士班)	0319	Seminar(一) (專題討論(一))	Required 必修	3	Chih-Hsiung, Hu 胡智熊	Course Outline
20	Institute of Industrial Engineering and Management (工業管理系工業工程與管理碩士班)	0320	Quantitative Research Methodology (數量研究方法)	Required 必修	3	Jyun-Ping, Huang 黃俊平	Course Outline
21	nstitute of Industrial Engineering and Management (工業管理系工業工程與管理碩士班)	0336	Data Mining (資料探勘)	Elective 選修	3	Ying-Lien, Lee 李英聯	Course Outline
22	Institute of Information Management(資訊管理系碩士班)	0096	Business Intelligence (商業智慧)	Elective 選修	3	Yung-Tsung, Hou 侯雍聰	Course Outline

23	Institute of Information Management(資訊管理系碩士班)	0098	ETL and Modeling for Big Data (大數據彙整與建模)	Elective 選修	3	Nian-Ze, Hu 胡念祖	Course Outline
24	Institute of Information Management(資訊管理系碩士班)	0099	Web Technology (Web 技術)	Elective 選修	3	Yu-Feng, Lan 藍友烽	Course Outline
25	Graduate School of Digital Contents and Creative Industries（多媒體設計系數位內容創意產業碩士班）	0180	Project Discussions (I) （專題討論(一)）	Required 必修	3	Siu-Tsen, Shen 沈思岑	Course Outline
26	Graduate School of Digital Contents and Creative Industries（多媒體設計系數位內容創意產業碩士班）	0181	Design Research Methods (研究方法特論)	Required 必修	3	Siu-Tsen, Shen 沈思岑	Course Outline
27	Graduate School of Digital Contents and Creative Industries（多媒體設計系數位內容創意產業碩士班）	0182	Human-Computer Interaction Design Research (人機介面互動設計研究)	Elective 選修	3	Siu-Tsen, Shen 沈思岑	Course Outline
28	Graduate School of Digital Contents and Creative Industries（多媒體設計系數位內容創意產業碩士班）	0188	Digital Media Communication (數位媒體傳播)	Elective 選修	3	Siu-Tsen, Shen 沈思岑	Course Outline

Courses taught in English

Course title 課程名稱	Special Topics on Metal Forming (金屬成型特論)
Course Description 課程概述	The course deals with manufacturing of metallic products by metal forming. To understand the principles of metal forming in industrial manufacturing, including the theory and simulation analysis of metal forming, such as stamping, forging, extrusion and rolling. Moreover, to understand the theory of metal forming and the basic concepts of plasticity theory. For example: rolling processing theory, forging processing theory, extrusion and drawing processing theory, etc. Through this course and practical product discussions, students should have sufficient metal forming related knowledge and skills.
Course objective 課程目標	The main objective of this course is to provide the students with usable information on: To understand the principles of metal forming. To understand the basic concepts of plasticity theory. To understand the various methods of metal forming. To understand the simulation analysis of metal forming.
Competence 核心能力	1. To have general competence regarding to metal forming technologies 2. The students are able to select the optimum manufacture method 3. To know the theory of metal forming
Prerequisite Course(s) 先修課程或先備能力	1. Fundamental knowledge of mechanical engineering 2. Basic understanding of manufacturing processes and materials science
Teaching Strategies 教學方法	1. lectures in class 2. Interactive discussion learning 3. Project study
Course Material 課程教材	Handout of Special Topics on Metal Forming
Grading 評量方式	1. Midterm Exam. and/or report: 30%. 2. Final Exam. and/or report: 30%. 3. Report and presentation: 30% 4. Class Attendance: 10%.
References 參考書目	
Contact with Teacher 老師聯絡資訊	Li-Wei Chen E-mail: liwei@nfu.edu.tw Tel: +886-56315315 Office: Department of Mechanical and computer-aided engineering/ Room A05
Course Outline 課程進度	
W1 W2	● Introduction of Special Topics on Metal Forming ● literature review skills on metal forming related reference

W3~W5 W6~W8 W9 W10~W11 W12~W13 W14~W17 W5~W17 W18	● Principle of metal forming ● Fundamental concept of plasticity ● Midterm Examination ● Analysis of the material properties of metal forming ● Analysis and simulation of metal forming ● Case study of advanced metal forming ● Project study ● Final Examination
Remarks 備註	

Courses taught in English

Course title 課程名稱	Biosolid Mechanics （生物力學）
Course Description 課程概述	This is a modified class that will focus on modeling and applications of biosolid mechanics to analyze and characterize biological tissue mechanics. The goal of the course is to understand the three most commonly used constitutive models for biological tissues, namely linear/nonlinear elasticity, viscoelasticity, and poroelasticity/biphasic theory, are constructed, how to determine constants for these models using experimental data, and how to use these constitutive models in finite element analysis of biological tissues.
Course objective 課程目標	1. Understand and be able to use index notation 2. Understand the concept of stress, deformation and strain 3. Understand the concepts and purpose of a constitutive model 4. Understand linear/nonlinear elastic, quasilinear viscoelasticity, and poroelasticity/biphasic constitutive models, including the use of numerical optimization methods to fit constitutive models to experimental data 5. Learn how constitutive models are applied to model different tissues, including cardiovascular, musculoskeletal and other tissues 6. Understand the concept of finite element modeling and how to create finite element models of tissues 7. Be able to perform a modeling study and communicate results both in writing and orally
Competence 核心能力	Stress, Anatomy
Prerequisite Course(s) 先修課程或先備	Stress Analysis, Advance Engineering Mathematics, Finite Element Analysis

能力	
Teaching Strategies 教學方法	Class (lecture) Teaching Computational Implementation (MSC MAC or ANSYS)
Course Material 課程教材	1. Introduction to the Mechanics of a Continuous Medium, Lawrence Malvern, 1969 2. Nonlinear Solid Mechanics: A Continuum Approach for Engineering, Gerhard Holzapfel, Wiley, 2002
Grading 評量方式	Grading: Homework 25% Midterm 25% Final 30% Project 20%
References 參考書目	1. Biomechanics: Mechanical Properties of Living Tissues, Y.C. Fung, 2. Cardiovascular Mechanics: cells, tissues, and organs, J.D. Humphrey
Contact with Teacher 老師聯絡資訊	Professor Lin Tel: 05-6315424 Email: samlin@nfu.edu.tw Office Hours: Tuesday 13:00-17:00 Thursday: 13:00-17:00

Course Outline 課程進度	
I. Fundamental Mechanics of Biomaterials A. Structure 1. Components: elastin, collagen 2. Soft tissues 3. Bone B. Function 1. Elastic behavior a. Geometric nonlinearity b. Material nonlinearity c. Strain energy 2. Inelastic behavior a. Hysteresis b. Preconditioning c. Stress relaxation d. Creep II. Field Equations of Solid Mechanics A. Analysis of Deformation B. Analysis of Stress C. Equations of Motion III. Constitutive Equations of Biomaterials A. Elasticity 1. Bone (hard tissue)	

2. Skin (soft tissue);pseudoelasticity B. Viscoelasticity 1. Blood vessels 2. Muscle C. Poroelasticity 1. Cartilage 2. Embryonic heart D. Muscle Activation E. Growth IV. Biological Structures A. Red Blood Cells B. Blood Vessels C. Left Ventricle D. Cochlea (inner ear)	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Friction Engineering (摩擦工程)
Course Description 課程概述	This course focuses on learning the expertise of friction and microfriction for understanding the phenomena of components in friction so that as the goal of improving and controlling component performance.
Course objective 課程目標	Objective for educating students to know the basic friction characteristics and its application in surface engineering of component, and with learning the correlation between Macro-Friction and Micro-Friction.
Competence 核心能力	1. Develop students' interdisciplinary knowledge in friction and Engineering design. 2. Develop students' capabilities in innovative thinking and problem-analysis with structural and systematic. 3. Develop students' capabilities in international trend and innovation application of friction technology.
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	Teaching materials: Self-made Teaching methods: Teaching in the classroom and laboratory Teaching resources: Laboratory equipment in teaching and learning

Course Material 課程教材	Self-made teaching materials
Grading 評量方式	Quiz, Mid-term exam, Final exam
References 參考書目	Friction Engineering (Writer: L. Blaw ; ISBN: 0471158933)
Contact with Teacher 老師聯絡資訊	05-6315428 jhhorng@gmail.com

Course Outline 課程進度	
Ch.1. Introduction 1.1. What is the friction. 1.2. Word of friction phenomena 1.3. Dry and lubrication friction 1.4. Friction control and impacts **Ch.2. Fundamental of sliding friction** 2.1. Macrocontact, microcontact and nanocontact 2.2. Static friction and stick-slip 2.3. Rolling friction 2.4. Sliding friction 2.3.1.Models for sliding friction 2.3.2.Statistical approaches for sliding friction 2.5. Friction heating **Ch.3. Effects of tribosystem variables on friction** 3.1. Surface finish and topography 3.2. Load and contact pressure 3.3. Sliding velocity 3.4. Type of sliding motion 3.5. Temperature **Ch.4. Running-in and other friction transition** 4.1. Understanding and interpreting friction transition 4.2. Friction transitions during running-in 4.3. Friction process diagrams 4.4. Friction and wear 4.5. Future development of friction	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Thermodynamics of Solids （固態熱力學）
Course Description 課程概述	This course will review important concepts of Thermodynamics of Materials first and reinforce more details for master students.
Course objective 課程目標	Let students who take this course have a picture of Thermodynamics concepts in mind and could apply the knowledge to researches and works in the future.
Competence 核心能力	Concepts of Thermodynamics with microscopic viewpoints and calculation of Thermodynamic functions.
Prerequisite Course(s) 先修課程或先備能力	Thermodynamics of Materials
Teaching Strategies 教學方法	Explaining, describing and demonstration in class
Course Material 課程教材	Gaskell, David R., Laughlin, David E., “Introduction to the Thermodynamics of Materials”
Grading 評量方式	mid-term exam 40%, final exam 40%, class participation 20%
References 參考書目	
Contact with Teacher 老師聯絡資訊	cytsai503@nfu.edu.tw +886-5-6313491

Course Outline 課程進度	
1st to 2nd week	introduction to Thermodynamics of solid
3rd to 5th week	the first law of Thermodynamics
6th to 8th week	the second law of Thermodynamics
10th to 15th week	Auxiliary functions
16th to 17th week	the third law of Thermodynamics

Remarks 備註	

Courses taught in English

Course title 課程名稱	Semiconductor Devices and Manufacturing Process (半導體元件與製程)
Course Description 課程概述	This course is for technology students talking their first course in semiconductor manufacturing. The course contains comprehensive and up-to-date information on the semiconductor industry. The course provides excellent descriptions of semiconductors, advanced manufacturing technologies, and plasma in integrated circuits processes. The materials covered in this course reflect the real fabrication situations.
Course objective 課程目標	This course is intended for technical and college students who need an in-depth understanding of the technology as they prepare to find a job in the field of IC industry.
Competence 核心能力	The course can help the students to learn more about their jobs, improve their troubleshooting and problem-solving skills, and raise their career development potential.
Prerequisite Course(s) 先修課程或先備能力	Basic Physics and Chemistry
Teaching Strategies 教學方法	Lecturing in class
Course Material 課程教材	Handouts can be down loaded from e-campus
Grading 評量方式	Midterm 30%, Final 40%, Performance in class 30%
References 參考書目	Introduction to Semiconductor Manufacturing Technology
Contact with Teacher 老師聯絡資訊	(Jau-Shiung Fang) jsfang@nfu.edu.tw, 05-6315466

Course Outline 課程進度	
Before Midterm 1. Introduction 2. Introduction to IC fabrication 3. Semiconductor basics 4. Wafer manufacturing 5. Thermal processes 6. Photolithography 7. Plasma basics	After Midterm 1. Ion implantation 2. Etch 3. CVD and Dieletric thin film 4. Metallization 5. CMP 6. Process integration 7. CMOS processes

Remarks 備註	

Courses taught in English

Course title 課程名稱	Autonomous Unmanned Vehicle System (自動化無人載具系統)
Course Description 課程概述	The fundamental characteristic of Autonomous Unmanned Vehicle Systems (AUVS) is the absence of a human operator on board. These systems fall into three main categories, land, sea, and air, the latter being the most popular. The development and application of AUVS is a rapidly emerging field of technology in many parts of the world. While much of the media attention has focused on military applications, the civil and commercial sector applications have grown, and continue to grow, stronger with each passing year. With AUVS technology expanding at such a fast pace, the need for understanding this rapid-growing field to the engineering students is increasingly important.
Course objective 課程目標	This 18 weeks long program provides broad and basic knowledge view of autonomous unmanned vehicle systems. During the course, teacher uses computer-based multimedia learning environments with multimedia presentations and video tutorials. This course is divided into 11 parts, logically building up the knowledge, touches on all major areas necessary to cover unmanned vehicle's systems and subsystems, communications, data links, payloads, control, types, roles and applications.
Competence 核心能力	The Capability for Developing an Unmanned Vehicle System
Prerequisite Course(s) 先修課程或先備能力	Automatic Control, System Engineering
Teaching Strategies 教學方法	In-class PPT and Case studies
Course Material 課程教材	Tailor-made teaching materials
Grading 評量方式	Mid-term Oral Presentation 30%, Final Oral Presentation 30%, Design Report 30%, and Roll Call 10%

References 參考書目	Unmanned Systems Documents & Websites
Contact Teacher 老師聯絡資訊	mtlee@nfu.edu.tw, 05-6315388

Course Outline 課程進度	
Part-1: Introduction to “System Engineering” Part-2: History & Applications of the Unmanned Vehicle Part-3: Unmanned Aerial Vehicle Part-4: Unmanned Ground Vehicle Part-5: Unmanned Maritime Vehicle Part-6: The Subsystem of an Autonomous Unmanned Vehicle	Part-7: Case Study: Building an Autopilot for UAV Part-8: Hardware/Software in the Loop Simulation Part-9: Navigation(I) – Inertial Navigation Part-10: Navigation(II) – Global Positioning System (GPS) Part-11: Sensors

Remarks 備註	

Courses taught in English

Course title 課程名稱	Application for Digital Image Processing (數位影像處理實務)
Course Description 課程概述	To teach the students to learn the methods of digital image processing for the application of industry.
Course objective 課程目標	To teach the digital image processing methods of convolution, edge detection, contour following, Hough transform, LSM etc.
Competence 核心能力	Algorithm of Image Processing, MATLAB Programming
Prerequisite Course(s) 先修課程或先備能力	Calculus, Engineering Mathematics

Teaching Strategies 教學方法	Oral, Lab, Report
Course Material 課程教材	R.C. Gonzalez and R.E. Woods , Digital Image Processing, 3rd Edition, Pearson Education.
Grading 評量方式	Lab 40%, Midterm 30%, Final 30%
References 參考書目	Hand-out
Contact with Teacher 老師聯絡資訊	kclee@nfu.edu.tw, 05-6315379

Course Outline 課程進度	
Introduction to image processing Convolution methods Edge Detection methods Contour Following method Hough Transform method	LSM Straightness Roundness Ellipticity
Remarks 備註	

Courses taught in English

Course title 課程名稱	FPGA System Design (FPGA 電路設計)
Course Description 課程概述	This course is designed for graduate students who are interested in advanced FPGA design n concept, design methodology, and basic concept of VLSI design. In the meantime, several Labs about the Xilinx Vivado tutorials will be demonstrated. After that, several lectures with the related topics to ZYNQ FPGA development kits will be given. Of course, we will select some state-the-art researches for computational efficient algorithm in FPGA/ARM implementation and these topics will be assigned as a small colloquium for students. At the end, graduate students shall present their final projects and its implementation on ZYNQ FPGA.
Course objective 課程目標	The objective of FPGA System Design is a guidance how advanced FPGA design mythology could be applied to recent SoC FPGA platform, further leads to embedded system design at system level.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能	HDL Language (VHDL or Verilog) CPLD/FPGA Implantation

力	
Teaching Strategies 教學方法	Lectures and Labs
Course Material 課程教材	● Power Point Slides ● FPGA labs ● ZYNQ Labs
Grading 評量方式	Home work assigments 20% Mid-term Presentation 20% Implementation 30% Presentation 10% Term 20%
References 參考書目	● W. Wolf, "FPGA-based System Design", Prentice Hall, 2004 ● S. Palnitkar, "Verilog HDL: A Guide to Digital Design and Synthesis", Prentice Hall, 2003, Second Edition ● Neil Weste, "CMOS VLSI Design: A Circuits and Systems Perspective (3th Edition)", Addison Wesley, 2005
Contact with Teacher 老師聯絡資訊	+886-5-6315631 ccsun@nfu.edu.tw Prof. Dr.-Ing. Chi-Chia Sun
Course Outline 課程進度	
1. Introduction of VLSI and FPGA 2. Challenges in VDSM and 3D-IC technology for FPGA 3. Xilinx Vivado Labs 4. ZYNQ Labs 5. Colloquium and Mid-Report 6. MPSOC (ARM-FPGA) Introduction and Labs 7. Colloquium Final-Project and Presentation	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Embedded System (嵌入式系統)
Course Description 課程概述	The course will introduce the fundamental of embedded system. Moreover, the lab experiences will train the students' practical skills. Installing embedded Linux, making Linux kernel and programming in the Linux environment are included in the lab experiences. Finally, the students will design, implement and present an embedded system project with team work.
Course objective 課程目標	1. Training the basic concepts of embedded system development. 2. Training the basic skills of driver programming and application programming for embedded systems.

Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	Introduction to computers Programming Language
Teaching Strategies 教學方法	● Lecture ● Lab Experience with Project-Based Learning
Course Material 課程教材	1. The own teaching materials 2. Wayne Wolf, Computers as Components, Second Edition: Principles of Embedded Computing System Design, Morgan Kaufmann, 2008/8/22. (ISBN：0123743974)
Grading 評量方式	● Participation: 10% ● Experiment: 40% ● Midterm: 20% ● Final Project: 30%
References 參考書目	
Contact with Teacher 老師聯絡資訊	hksu@nfu.edu.tw 05-6315619

Course Outline 課程進度	
1. Introduction to Embedded Computing 2. Instruction Sets 3. CPUs 4. Bus-Based Computer Systems 5. Processes and operating Systems 6. Embedded Linux Operating system 7. The Linux kernel 8. Linux Driver and Application Programming 9. Final Project	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Intelligent Optimization Algorithm (智慧型最佳化演算法)
Course Description 課程概述	This course introduces the optimization theorems such as linear programming, quadratic programming, nonlinear programming, and intelligent algorithm such as GA, PSO, ACO, SA, neural networks, machine learning, deep learning for research application. Students must select a paper (must be a journal paper, IEEE is best) that belongs to optimization topic and implement the intelligent algorithm with Matlab. Students must present this paper thirty minutes in the finally examination with

	English and reserve 5 minutes for discussion. Besides, finally report needs use English to write the content.
Course objective 課程目標	This course introduces the optimization theorems and intelligent algorithm for research application. Besides, this course will implement the intelligent algorithm with Matlab.
Competence 核心能力	Possess information technology expertise in the field of computer science and information engineering. Possess the ability on plan and execute research project. Possess the ability to write and to present professional papers. Possess the ability to think creatively and solve problems independently. Possess the ability that has a good international outlook.
Prerequisite Course(s) 先修課程或先備能力	Computer Programming, Calculus, Linear Algebra, Probability and Statistics, Numerical Analysis
Teaching Strategies 教學方法	Class teaching, papers or technical reports studying, and project practicing
Course Material 課程教材	1.“Optimization Toolbox™ User’s Guide R2017b,” Mathworks, 2017 2. Handout from web and E-library.
Grading 評量方式	1. Mid-term exam 30% 2. Final exam 30% 3. Participation and Presentation 40% (class attendance, discussion, homework, and group work will be used)
References 參考書目	1. Paper from E-library. 2. Nello Cristianini and John Shawe-Taylor, “An Introduction to Support Vector Machines and Other Kernel-based Learning Methods,” Cambridge University Press, 2000.
Contact with Teacher 老師聯絡資訊	E-mail：tsong@nfu.edu.tw

Course Outline
課程進度

單元主題	主題大綱
Unit 1	Introduction to Engineering Optimization
Unit 2	Introduction to Matlab Optimization Toolbox
Unit 3	Programming in Matlab
Unit 4	Quadratic Programming Optimization Problems
Unit 5	Unconstrained Optimization Problems
Unit 6	Constrained Optimization Problems
Unit 7	Lagrange Multiplier Method
Unit 8	Introduction to intelligent optimization algorithm such

	as GA, PSO, ACO, SA, SVM, LS-SVM, Neural Networks, Machine Learning
Unit 9	Implement Optimization Algorithm and Intelligent algorithm with Matlab
Unit 10	Intelligent Optimization Paper Study and Presentation
Remarks 備註	※Regular attendance is expected and necessary to understand the material. You are expected to be in class and on time each week, attendance will be taken each week. ※Roll will be taken each week and can be used to assess grade in borderline cases. ※Student who leaves class early will be counted absent for that class, unless prior approval has been given by me. ※If you miss a class with a valid excuse and wish to have the absence not counted, you should turn in an absence from with the appropriate documentation. (In advance apply is best) ※I expect you to attend every class meeting except in the event of personal illness or family emergency or official school activities. ※You are responsible for all work whether you attend class or not. ※You must download handout from the E3 platform before class and print them in advance. At the same time, study these materials and take to class.

Courses taught in English

Course title 課程名稱	Research Writing for Science and Technology (科技論文寫作)
Course Description 課程概述	This course is to help students to apply their analytical and rhetorical skills to the discourses of their chosen disciples (multi-disciplinary basis) and to explore how effective academic writing is achieved. It also helps students (as junior researchers) start from small-scale language points to eventually be able to write an article for publication. These skills gained from this course can also be applicable to other tasks such theses, dissertations, conference/journal papers, technical reports, and/or patent writing etc.
Course objective 課程目標	The gist of this course aims to provide overarching knowledge to help students prepare and write their research related documents.
Competence 核心能力	Students expect to possess the skills and knowledge applying in academic writing of their chosen fields.
Prerequisite Course(s) 先修課程或先備能力	Basic English Writing
Teaching Strategies	Lecturing with Slides and Whiteboard

教學方法	
Course Material 課程教材	• Writing Up Research: Experimental Research Report Writing for Students of English,Weissberg and Buker, 2008, 文鶴 (Main Book) • Academic Writing for Graduate Students-Essential Tasks and Skills, Swales and Feak, 2007, 文鶴
Grading 評量方式	Attendance 10% Quiz 20% Mid-Term Exam 30% Final-Term Exam 30% Class Participation 10%
References 參考書目	Experimental Reaearch Report Writing for Students of English
Contact with Teacher 老師聯絡資訊	05-6315598 E-MAIL：ptsai@nfu.edu.tw

Course Outline 課程進度	
Academic Writing - Academic Research Writing	I: Academic Writing
	1. Academic Research Writing
	2. Revisions and Response to Reviewers
	3. Article Search and Library Access
	4. Digital Databases
	5. Academic writing approach
Academic Writing - Revisions and Response to Reviewers	Writing Up Research
	1. Introduction
	2. Method
	3. Materials
	4. Results
	5. Discussion
	6. Abstract

Remarks 備註	

Courses taught in English

Course title 課程名稱	Marketing Management （行銷管理）
Course Description 課程概述	Ch 1 Defining Marketing Ch 2 Developing Marketing Strategies and Plans Ch 3 Scanning the Environment Ch 5 Creating Customer Value Ch 6 Analyzing Consumer Markets Ch 8 Identifying Marketing Segments and Targets Ch 10 Crafting the Brand Position Ch 12 Setting Product Strategy Ch 13 Designing and Managing Services Ch 14 Developing Pricing Strategies and Programs Ch 15 Designing and Managing Integrated Marketing Channels Ch 17 Designing and Managing Integrated Marketing Communications
Course objective 課程目標	1. Understanding Marketing Management 2. Capturing Markketing Insights 3. Connecting with Customers 4. Building Strong Brands 5. Shaping the Marketing Offerings 6. Delivering Value 7. Communicating Value
Competence 核心能力	1. Planning 7 2. Marketing management skill 10 3. Enhancing cooperation 5 4. Innovation 5 5. Problem solving 7 6. Expanding vision 6 7. Business practice 5
Prerequisite Course(s) 先修課程或先備能力	Listen and speak in English
Teaching Strategies 教學方法	ORAL
Course Material 課程教材	Kotler and Keller (2016), Marketing Management, 15th ed., Pearson Education, Inc.
Grading 評量方式	Class Assignment:40%; Presentation of Paper or Marketing Planning:40%; Class Participation:20%.

References 參考書目	Pride and Eerrell (2011), Marketing Management, 4th ed., South-western, Cengage Learning
Contact with Teacher 老師聯絡資訊	mscheng@nfu.edu.tw

Course Outline
課程進度

Ch 1 Defining Marketing	Defining Marketing	
	introduction	
Ch 2 Developing Marketing Strategies and Plans	Developing Marketing Strategies and Plans	
Ch 3 Scanning the Environment	Scanning the Environment	
Ch 5 Creating Customer Value	Creating Customer Value	
Ch 6 Analyzing Consumer Markets	Analyzing Consumer Markets	
Ch 8 Identifying Marketing Segments and Targets	Identifying Marketing Segments and Targets	
Ch 10 Crafting the Brand Position	Crafting the Brand Position	
Ch 12 Setting Product Strategy	Setting Product Strategy	
Ch 13 Designing and Managing Services	Designing and Managing Services	
Ch 14 Developing Pricing Strategies and Programs	Developing Pricing Strategies and Programs	
Ch 15 Designing and Managing Integrated Marketing Channels	Designing and Managing Integrated Marketing Channels	
Ch 17 Designing and Managing Integrated Marketing Communications	Designing and Managing Integrated Marketing Communications	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Business Data Analysis （企業資料分析）
Course Description 課程概述	This course is broken into four main topic areas each covered in approximately one quarter of the course: 1. Introduction to Experimental Design, Causal Analysis, and Data Mining: What is it? Why is it important? Why is it interesting? Definitions and theories and how they apply (or not) to real cases. 2. Modeling: Building modeling through experimental design,

	survey, data collection, and modeling techniques that the participants can understand how to model the research target. 3. Innovation in Data Analysis: What new ways of doing experimental design, causal analysis, and data mining can be used to enhance business data analysis? 4. Practice: Analyzing business data through a designed experiment, a conducted survey, or a set of prepared data from a case company to find the operation procedures of data analysis.
Course objective 課程目標	Experiments and surveys need statistics to find the useful implications behind to the audiences. Nowadays, the use of structural equation modeling (SEM) and advanced statistics methods have mushroomed in these decades. SEM is widely recognized as one of the most powerful and most comprehensive methods for testing causal relationships among factors. Data mining, or intelligent analysis of information stored in data sets, has recently gained a substantial interest among practitioners in a variety of fields and industries. Nowadays, almost every organization collects data, which can be analyzed in order to make better decisions, conclude customer patterns, improve policies, detect credit fraud, predict important events, monitor, and evaluate reliability, etc. The course will provide conceptual bases of SEM and advance statistics as well as applications necessary to undertake researches. Students will learn to critically think about causal relations, measurement of variables, and testing of theories. There will also be plenty of demonstrations and hands-on exercises using SPSS AMOS version 18. Additionally, this course will provide the participants with understanding of the data mining methodologies, and with the ability of formulating and solving problems with them. Students will have a chance to understand the complicated environment of today's data mining business market.
Competence 核心能力	problem solution, multi-dimension thinking, systematic analysis, and business analysis.
Prerequisite Course(s) 先修課程或先備能力	N/A
Teaching Strategies 教學方法	Oral presentation, case discussion
Course Material 課程教材	Barbara M. Byrne（2001）.Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming. Lawrence Erlbaum Associates. Handbook of partial least squares (2016). Springer Berlin Heidelberg.
Grading 評量方式	Presentation 20% Homework and Discussion 40% mid-exam/report 20% final-exam/report 20%
References 參考書目	
Contact with Teacher	chihchin@nfu.edu.tw

老師聯絡資訊	

Course Outline
課程進度

Research Framework	Foundations of Information systems in business competing with information technology
	How to build up a research framework
How to Build up Research Motivation	What is research motivation. How to write a rational motivation.
Discussion of Managerial Implications	1. What are the scholar's concerns? 2. What are the manager's concerns?
Logical thinking and writing	1. What is a logical thinking? 2. debate and argument? 3. claims or a theoretical argument? 4. How to convince the audiences?
Discussion of Questionnaire	What is survey? what is data mining? What do we concern about the development of a questionnaire? How to form your question items? A logical thinking about question items? What do you want to measure?
Discussion of Causality Relationship Analysis	The introduction of CB-SEM. What do we concerns about the analysis using CB-SEM application? Tests and checks are always needed after an analysis.
Discussion of PLS-SEM	What is PLS-SEM? What is the difference between CB-SEM and PLS-SEM? What is the research implications behind? How to use PLS-SEM to measure causality relationship?
Experimental Design	What is experimental design? Why we need the experimental design? small samples? large samples? Why we need to perform an experiment with multiple times? Do we need the outside effect?
Data Mining	Why do we need data mining? What do we do about the mining? Algorithm and its performance?

Remarks 備註	

Courses taught in English

Course title 課程名稱	Corporate Financial Management （公司財務管理）
Course Description 課程概述	The course introduce most areas of corporate finance which a manger need to know, including the financial statements, valuation of financial assets, capital budgeting, risk management, long term financial policy, short term financial planning, cash management and dividend policy.
Course objective 課程目標	This course studies fundamentals of corporate finance and capital markets, emphasizing the financial aspects of managerial decisions. The course draws also focus on empirical research to help guide managerial decisions, so students have to read some journal papers on the same times.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	oral
Course Material 課程教材	Principle of corporate finance, by Brealey, Myers and Allen, 2nd concise edition.
Grading 評量方式	mid-exam 30% final exam 40% presentation and participation 30%
References 參考書目	Journal of corporate finance
Contact with Teacher 老師聯絡資訊	chilin@nfu.edu.tw

Course Outline
課程進度

1.financial background 2.financial analysis 3.time value of money	1An Overview of Finance	
	2Financial Background	
	3Cash flow and financial analysis	

4.valuation of bond 5.valuation of stock	4financail sysytem	
	5time value of money	
	6the valuation of bonds	
	7the valuation of stocks	
	8risk and return	
1.risk and return 2.capital budgeting 3.cost of capital 4.capital structure 5.dividends	9.capital budgeting	
	10.cash flow estimation	
	11.cost of capital	
	12capital sturcture	
	13coporate restructuring	
Remarks 備註		

Courses taught in English

Course title 課程名稱	Global Marketing (全球化行銷)
Course Description 課程概述	To understand trade distortions and marketing barriers, culture, consumer behavior, International Marketing Research, foreign market entry strategies, product and branding strategies, promotion and pricing strategies, and currencies and foreign exchange
Course objective 課程目標	1. To understand and implement a variety of International Marketing research designs and measurement techniques. 2. To practice critical evaluation of International Marketing research articles. 3. To facilitate the independent conduction and report of International Marketing research and case study.
Competence 核心能力	1. Planning 9 2. Marketing management skill 9 3. Enhancing cooperation 9 4. Innovation 9 5. Problem solving 9 6. Expanding vision 9 7. Business practice 9
Prerequisite Course(s) 先修課程或先備能力	English
Teaching Strategies	Lecture; Case Discuss; Field Trip

教學方法	
Course Material 課程教材	Global Marketing Management
Grading 評量方式	Lecture; Case Discuss; Field Trip
References 參考書目	
Contact with Teacher 老師聯絡資訊	CMA0722 Research Room

Course Outline 課程進度	
Global Environment	Introduction to Global Marketing Global Economic Environment Political and Legal Environment Cultural Environment
Global Marketing Management	Global Customerst Global Marketing Research Global Segmentation and Position Global Marketing Strategy Global Market Entry Modes Global Product Development,Marketing Products and Services Global Pricing Communication with the World Consumer Sales Management
Global Logistics, Distribution and Export, Import Management	Global Logistics and Distribution and Global Marketing Channels Export and Import Management

Remarks 備註	

Courses taught in English

Course title 課程名稱	Entrepreneurial management (創業管理)
Course Description 課程概述	This course is designed to provide knowledge in the field of entrepreneurial management. The course combines lectures, case analyses, guest speakers and student presentations. Students will learn the critical issues of new venture strategy and business planning through reading. At the end of the semester, students will be able to

	become a successful entrepreneur or an effective entrepreneurial team member.
Course objective 課程目標	1. A familiarity with current topics in entrepreneurial management. 2. A familiarity with the entrepreneurial process. 3. The ability to apply these concepts directly to real world situations.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	
Teaching Strategies 教學方法	Lectures, presentations, and discussion
Course Material 課程教材	Barringer, B. R., & Ireland, R. D. (2018). ***Entrepreneurship: Successfully Launching New Ventures: 6th Edition***. New York: Pearson
Grading 評量方式	Class Participation ..... 10% Case Presentation (by group)..... 30% Mid-term exam ..... 30% Final Project (by group)..... 30% Innovation Bonus..... 5~10%
References 參考書目	Journal of Business Venturing, Strategic Entrepreneurship Journal, Inc., Entrepreneur, and Fast Company.
Contact with Teacher 老師聯絡資訊	ycchen@nfu.edu.tw
Course Outline 課程進度	
Chapter 0: Entrepreneurial Trends Chapter 1: Introduction to Entrepreneurship Chapter 2: Recognizing Opportunities and Generating Ideas Chapter 3: Feasibility Analysis Chapter 4: Developing an Effective Business Model Chapter 5: Industry and Competitor Analysis Chapter 6: Writing a Business Plan Chapter 8: Assessing a New Venture's Financial Strength and Viability Chapter 9: Building a New-Venture Team Chapter 10：Getting Financing or Funding Chapter 11：Unique Marketing Issues	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Motivation and Leadership 激勵與領導
Course Description 課程概述	This course is designed for graduate students that give attention to research findings about leadership, leadership practice, and skill development.
Course objective 課程目標	This course is intended to provide students a comprehensive understanding of foundation of motivation and leadership development by offering theoretical background, practical information and an opportunity of self-assessment.
Competence 核心能力	Motivation and Leadership concepts, Communication and team work skills
Prerequisite Course(s) 先修課程或先備能力	Management
Teaching Strategies 教學方法	The course will consist of lecture, self-assessment, discussion, cases and application through experiential exercises for both the individual and group. Student-led exercises will be a major part of the student learning experience. Students are required to read the assigned text and any supplemental material before class. Appropriate and supportive behavior is critical for this class. Therefore, students have to listen actively and respectfully to whoever is speaking.
Course Material 課程教材	Principles of Leadership, 7th Edition by Andrew J. DuBrin, South-Western Cengage Learning.
Grading 評量方式	Presentation 30% Participation 30% Final Project 40%
References 參考書目	Effective Leadership, Achua and Lussier
Contact with Teacher 老師聯絡資訊	graceliu@nfu.edu.tw

Course Outline
課程進度

Introduction	Introduce the class requirements and format
Motivation Theories	Understanding the contemporary motivation theories
The Nature and Importance of Leadership	The meaning of leadership
	The impact of leadership on organizational performance

	Leadership roles
Traits, Motives, and Characteristics of Leaders	Personality traits of effective leaders
	Leadership Motives
Charismatic and Transformational Leadership	The meanings of charisma
	Types of charismatic leaders
	Characteristics of charismatic leaders
	Transformational leadership
Leadership Behaviors, Attitudes, and Styles	Task-related attitudes and behaviors
	Relationship-oriented attitudes and behaviors
Contingency and Situational Leadership	Situational influences on effective leadership behavior The path-goal theory of leadership effectiveness
Leadership Ethics and Social Responsibility	Principles and practices of ethical and moral leadership
Power, Politics, and Leadership	Sources and types of power Factors that contribute to organizational politics
Influence Tactics of Leaders	A model of power and influence
Developing Teamwork	Leader's action that foster teamwork
Motivation and Coaching Skills	Expectancy theory and motivation skills
Communication and Conflict Resolution Skills	Inspirational and powerful communication Listening as a leadership skill
Creativity, Innovation, and Leadership	Characteristics of creative leaders Overcoming traditional thinking as a creative strategy
International and Culturally Diverse Aspects of Leadership	Cultural factors influencing leadership practice
Strategic Leadership and Knowledge Management	The nature of strategic leadership Knowledge management and the learning organization
Leadership Development and Succession	Development through self-awareness and self-discipline Development through education, experience, and mentoring
Final Project	Present the final project

Remarks 備註	

Courses taught in English

Course title 課程名稱	Financial Statements Analysis (財務報表分析)
Course Description 課程概述	This is a graduate-level course about analysis of financial statements and applications of financial statement analysis to practical cases. The major topics cover introduction to financial statements, how financial statements are used in valuation, viewing the business through financial statements, the analysis of balance sheet, income statement, cash flow statement, profitability, growth and earnings.
Course objective 課程目標	The objective of this course is to introduce the knowledge required for financial statement analysis and to help students understand the techniques to solve the problems in financial statement analysis. Students will learn how to forecast, evaluate and analyze business strategies from case studies.
Competence 核心能力	Professional skills, business ethics
Prerequisite Course(s) 先修課程或先備能力	A basic understanding on accounting will be helpful but is not required
Teaching Strategies 教學方法	Lecture, case study, and discussions
Course Material 課程教材	Financial Statement Analysis and Security valuation, Stephen H. Penman, 5 edition, McGraw Hill.
Grading 評量方式	Mid-term Exam. 35% Final Exam. 35% Homework and Presentation 15% Regular attendance 15%
References 參考書目	Business Analysis and Valuation, Palepu, K.G., P. M. Healy and E. Peek, Cengage Learning, 3rd, 2013.
Contact with Teacher 老師聯絡資訊	Email: fengtset@icloud.com

Course Outline 課程進度	
Introduction to Financial Statements, Investing, and Valuation Cash Accounting, Accrual Accounting, and Discounted Cash Flow Valuation Viewing the Business Through the Financial Statements The Analysis of the Balance Sheet and Income Statement	

The Analysis of the Cash Flow Statement Mid-term Exam The Analysis of Profitability The Analysis of Growth and Sustainable Earnings Full-Information Forecasting, Valuation, and Business Strategy Analysis Analysis of the Quality of Financial Statements The Analysis of Equity Risk and Return The Analysis of Credit Risk and Return Final Exam	
Remarks 備註	Course website

Courses taught in English

Course title 課程名稱	Seminar 1 (專題討論(一))
Course Description 課程概述	First, all students must introduce themselves, and then present some features of their countries or the countries they select all in English. Secondly, some English IE-related articles from News or Magazines are provided, and students must present the review in English. Finally, some English IE-related research papers are provided, and students also present the review in English.
Course objective 課程目標	1. Students are going to understand more about other countries. 2. Students are going to do literature review and discuss in English.
Competence 核心能力	English Communication Capability Global Understanding Capability of Literature Review
Prerequisite Course(s) 先修課程或先備能力	Basic English Communication Capability
Teaching Strategies 教學方法	Lecture Student Presentation Discussion
Course Material 課程教材	News/Magazine articles Research papers
Grading 評量方式	Presentation 70% Participation 30%
References 參考書目	None

Contact with Teacher 老師聯絡資訊	chh@nfu.edu.tw 05-631-5720 05-631-5004

Course Outline 課程進度	
Introduction Introduce yourself Introduce the education system of your country Introduce the demography of your country Introduce the culture of your country Introduce the economy of your country	Introduce the tourism of your country Introduce optional title of your country Presentation and discussion of Industrial Engineering Related Articles Presentation and discussion of Research papers

Remarks 備註	

Courses taught in English

Course title 課程名稱	Quantitative Research Methodology （數量研究方法）
Course Description 課程概述	An introducing course of quantitative mathematical models.
Course objective 課程目標	To learn the mathematical tools for management problems.
Competence 核心能力	Application of quantitative mathematical models.
Prerequisite Course(s) 先修課程或先備能力	None.
Teaching Strategies 教學方法	Lecture.
Course Material 課程教材	Quantitative Analysis for Management by Barry Render, Ralph M. Stair, Jr. Michael E. Hanna. ISBN-13 978-0-273-75286-8
Grading 評量方式	Homework assignment 30%, Mid-term exam. 30%, Final exam. 40%
References 參考書目	1. Mathematical statistics with applications by Wackerly, Mendenall and Scheaffer. 2. Linear programming and network flows by Bazaraa, Jarvis and Sherali.
Contact with Teacher	Email:jphuagn@nfu.edu.tw Tel:05-6315714

老師聯絡資訊	
Course Outline 課程進度	
Ch2 Probability and Statistics Ch3 Decision Making Ch4 Regression Models Ch 9 Transportation and assignmrnt models Ch 10 Network models Ch 12 Waiting and Queuing models	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Data Mining (資料探勘)
Course Description 課程概述	This course introduces students to Data Mining with the emphasis on analytical methods and the use of computerized tools.
Course objective 課程目標	1. To understand the theoretical basis and concepts of Data Mining 2. To be familiar with the analytical methods and their applications in the realm of industrial and service sectors
Competence 核心能力	● Practical skill set for the job of business analytics ● Good command of computerized tools
Prerequisite Course(s) 先修課程或先備能力	None
Teaching Strategies 教學方法	1. Lecturing and discussion 2. Utilization of computerized tools 3. Student presentation and discussion of assigned cases, readings and problems
Course Material 課程教材	Data Mining for Business Analytics: Concepts, Techniques and Applications in Python, 1st ed., Galit Shmueli, John Wiley & Sons, Inc.
Grading 評量方式	● Midterm exam: 30% ● Presentation: 30% ● Final exam: 30% ● Participation: 10%

References 參考書目	None
Contact with Teacher 老師聯絡資訊	yinglienlee@gmail.com

Course Outline 課程進度	
● Introduction ● Overview of the Data Mining process ● Data Visualization ● Dimension reduction ● Evaluating predictive performance	● Prediction and Classification methods ● Mining relationships among records ● Forecasting Time Series ● Data Analytics ● Cases

Remarks 備註	

Courses taught in English

Course title 課程名稱	Business Intelligence （商業智慧）
Course Description 課程概述	This course aims at giving students an understanding of basic BI concepts, terminologies and technologies. This course serves as a comprehensive introduction to the various aspects of BI, including the business impacts, management and relevant information technology.
Course objective 課程目標	The student will learn the theoretical and practical knowledge from both the technical and organization perspectives.
Competence 核心能力	System Management, Information Technology
Prerequisite Course(s) 先修課程或先備能力	NA
Teaching Strategies 教學方法	Lectures, discussions, presentation, and HW assignments
Course Material 課程教材	1. Business Intelligence (2nd Edition) by Efraim Turban, Ramesh Sharda, Dursun Delen, and David King (Jul 28, 2010) 2. The Kimball Group Reader: Relentlessly Practical Tools for Data Warehousing and

	Business Intelligence by Ralph Kimball, Margy Ross, Warren Thornthwaite, and Joy Mundy (Feb 8, 2010)
Grading 評量方式	Presentation Midterm & Final report
References 參考書目	NA
Contact with Teacher 老師聯絡資訊	Dept. of Information Management, Yung-Tsung Hou 05-6315731

Course Outline 課程進度			
Week 1	Business Intelligence Introduction	Week 10	BI with Balanced Score Card
Week 2	BI Architecture	Week 11	BI and Big Data
Week 3	Business Strategies and Performance Indicators	Week 12	Big Data Introduction I
		Week 13	Big Data Introduction II
Week 4	Dimensional Modeling and Data Warehousing	Week 14	BI and Big Data System I
		Week15	BI and Big Data System II
Week 5	Information Retrieval and Transformation	Week16	Advance BI Analytical tools
		Week 17	BI and Big Data Application
Week 6	Information Handling	Week 18	Final Report
Week 7	Cube and Business Analytics		
Week 8	OLAP		
Week 9	Midterm		

Remarks 備註	

Courses taught in English

Course title 課程名稱	ETL and Modeling of Big Data (大數據彙整與建模)
Course Description 課程概述	This introductory course gives an overview of many concepts, techniques, and processes in Big Data, beginning with topics such as business process and data business matrix and ending up with more recent topics such as slowly changing dimension, bridge tables and some advance fact table techniques.. The course will give the students the basic ideas and intuition behind modern data modeling methods as well as a bit more formal understanding of how, why, and when they work. The underlying theme in the course is ETL method as it provides the data flow for most of the scenarios covered.
Course objective 課程目標	The goal of this course is to give an introduction to the modeling technique of Big Data. The course will teach student basic skills to decide which approaches to use for

	what scenarios, build up your own data warehouse structure.
Competence 核心能力	Data Integration, Data Processing, Data Modeling
Prerequisite Course(s) 先修課程或先備能力	Database fundamental and Business Intelligence
Teaching Strategies 教學方法	Hands-on training
Course Material 課程教材	The Data Warehouse Toolkits second edition
Grading 評量方式	Midterm 20%, Final 20%, Class Practice 30%, Project 30%
References 參考書目	The Data Warehouse ETL Toolkit, Ralph Kimball
Contact with Teacher 老師聯絡資訊	Office Hours: Monday 11-12am. Contact by email.

Course Outline 課程進度	
Introduction to Big Data Architecture Database fundamental Data Modeling Dimensions Modeling Myths	Fact Table Techniques Dimension Table Techniques Design for various Scenarios ETL Modeling ETL Plan ETL Implmentation
Remarks 備註	

Courses taught in English

Course title 課程名稱	Web Technology (Web 技術)
Course Description 課程概述	The Web Technology course is designed to prepare students for professional web design work. The class will be a mix of not only theoretical and soft skills, but also practical front-end and back-end techniques in web design. Upon completion of this course, students should have a thorough knowledge of all areas of web page design. Topics of front-end techniques include the knowledge of HTML5 and CSS3,

	JavaScript, jQuery, ReactJS, Harp.js and Bootstrap 4. In terms of back-end techniques, topics include building web servers, PHP scripting language, and MySQL database. By the end of this course, students should have a solid understanding of the web design industry and modern web design techniques.
Course objective 課程目標	This course presents the process of designing and developing web sites from conception through the publication. Students gain valuable hands-on lab experience using web authoring software. The objectives of course are as follows: 1. Advanced use of HTML5 and CSS3 for web design 2. Understand the basics of computer programming languages using JavaScript 3. Apply jQuery, HTML5, and CSS3 effectively to create interactive and dynamic websites 4. Building responsive web pages with Bootstrap 4 5. Integrating client-side and server-side scripting into a website 6. Understanding of the framework of ReactJs and Harp.js in site development
Competence 核心能力	1. Logical Thinking and Analysis Competency : 8 point 2. Problem Solving Competency : 8 point 3. Information System Application and Integration Competency : 8 point 4. Internationalization and Foreign Language Competency : 9 point
Prerequisite Course(s) 先修課程或先備能力	We may suggest that students should have a basic working knowledge of HTML5 and CSS3 coding as well as uploading websites via FTP.
Teaching Strategies 教學方法	Material for this course will be presented using multiple teaching approaches, including lecture and discussion, exploration and inquiry, field experiences, cooperative group work, demonstrations, role plays, and/or presentations.
Course Material 課程教材	Title: Bootstrap 4 – Responsive Web Design Publisher: Packt Publishing Ltd. ISBN: 978-1-78839-731-5 Author: Silvio Moreto、Matt Lambert、Benjamin Jakobus、Jason Marah
Grading 評量方式	Students are evaluated on the basis of their timely and effective completion of homework assignments and projects. The detailed items are summarized as follows: 1. Class Participation* 30% 2. Project 35% 3. Homework 35% *Participation includes: presence in class (chat, responses to questions, actively engaged, etc.), attendance, and Discussion Board activity (postings and comments).
References 參考書目	● HTML5 & CSS3 Visual QuickStart Guide (7th Edition) by Elizabeth Castro, Bruce Hyslop ONLINE VERSION ● HTML5: Up and Running by Mark Pilgrim ONLINE VERSION ● Bootstrap Essentials by Snig Bhaumik ● Learning Web Development with React and Bootstrap by Harmeet Singh and Mehul

	Bhatt
Contact with Teacher 老師聯絡資訊	Yu-Feng Lan Email: yflan@nfu.edu.tw Office: C-MA-0912 Office Phone: 05-6315745 Cell Phone: 0960-060-989

Course Outline 課程進度	
1. Getting Bootstrap and setting up the framework 2. Understanding the grid system 3. Creating a landing page for different devices 4. Forming the forms and customizing buttons dropdown 5. Building a Web App 6. Working with JavaScript 7. Customizing a Bootstrap component	8. Project and team group discussion 9. Using Bootstrap Build Tools: Harp.js and Node.js 10. Flexbox basics and terminology 11. Using multiple containers on a single page 12. Reboot defaults and basics of content 13. Playing with components (Part I) 14. Playing with components (Part II) 15. Project and team group discussion

Remarks 備註	

Courses taught in English

Course title 課程名稱	Project Discussions (I) (專題討論(一))
Course Description 課程概述	• *Course content:* What is the basic content of the course and what makes it important or interesting? How does the course fit into the context of the discipline? • *Learning objectives:* What should students be able to do by the end of the course? Objectives are most helpful when they are expressed in terms of knowledge and skills that can be readily identified and assessed. For example, the ability to recognize, differentiate, apply or produce is much more readily identifiable than the ability to appreciate or understand. • *Characteristics of class meetings:* What types of activities should students be prepared for? Discussion? Lecture? Small groups? Student presentations?

Course objective 課程目標	The course aims to prepare, develop, determine and initially exemplify a design programme. The course also aims to develop the ability to document and justify design work. Once the course has been passed, students should be able to: 1. Develop and initially determine and exemplify a design programme based on their own selected project brief (What). 2. Develop and initially reflect on methods and working processes with reference to the planning and determination of a design programme (How). 3. Present, justify and critically discuss students' own proposed design programme (Why).
Competence 核心能力	1. Planning and development of a design programme 2. Experimental work in studio, workshops and laboratories Read two articles from a professional journal and write a one page report in unbound format and other formats.
Prerequisite Course(s) 先修課程或先備能力	1. All the participants would have to attend my undergraduate courses in the past 2. All the participants would be familiar with multimedia design relevant professional skills such as Photoshop, Illustrator, Flash, 3D Max, Uniity etc. 3. Only for Multimedia Design Department students
Teaching Strategies 教學方法	Oral presentations and interactive discussions
Course Material 課程教材	Teacher's prepared materials
Grading 評量方式	1. Grades will be determined by a student's performance on a midterm (15%), a final (20%), individual written assignments (20%), and a group project and assignments (45%). The project grades will be as a result of 1) individual presentations, 2) demos, 3) project write-ups, and 4) ratings given by the other members of the project team. The class will *not* be graded on a curve. The final grades will be determined by the standard scale of 90% = A-, 80% = B-, etc. 2. Individual homework should be done independently. It is fine to discuss the general techniques and methods required, but you must do your own work in solving the problems and writing up the solutions. *Cheating will not be excused* and will lead to failure in the course. After you turn in your individual homework, you may use this information in the group, combined with others homework, to aid in the project redesigns.
References 參考書目	
Contact with Teacher 老師聯絡資訊	My research office is located in A&H building 5TH Floor. Office telephone: 05-631-5878 Email: stshen@nfu.edu.tw
Course Outline 課程進度	

Lecture Week 1-2: Course Introduction Lecture Week 3: Fundamental Concepts Lecture Week 4: Studying Individuals based on each pupil's chosen topic Lecture Week 5: Analysing the detailed contents and structures Lecture Week 6-7: Preparing and Working with the intended presentation Lecture Week 8: Visualizing and finalizing the work Week 9 Mid Term Exam	Lecture 10-11: Discussions and feedbacks Lecture 12: Studying the second chosen topic Lecture 13: Analysing detailed contents and structures Lecture 14-15: Preparing and Working with the intended presentation Lecture 16-17: Visualising and finalizing the work Week 18 Final Term Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Design Research Methods (研究方法特論)
Course Description 課程概述	• This course will prepare you to successfully utilize design as a catalyst for innovation and change. Along the way, you will investigate the world of innovation, creativity and design thinking. In this class you will venture into the world of "fuzzy" or unstructured situations where problems are yet undefined but within a larger context. You will use design research methods to sort through and tackle complex conditions— where you must identify and define those unstated needs for design—possibly utilizing design that goes outside the classic concerns of traditional visual communication. Application and integration of theory, methods and skills for design analysis in the context of cross disciplinary collaborative processes for innovation. Identifying patterns and framing insights. Emphasis on defining problems in fuzzy situations. Surveying, performing and evaluating design analysis methodologies from multiple disciplinary perspectives. Several techniques will be explored within each phase of the design research process.

Course objective 課程目標	4. You will identify and solve challenging communication problems through: visualization of gathered data and solutions and the creation of prototypes for evaluation. 5. You will use techniques and strategy tools to manage complex communication issues by: (a) extracting maximum information from facts; (b) using strategies to break down problems into manageable parts; (c) identifying likely causes of problems; (d) recognizing the patterns that are present within given situations. 6. You will use techniques for effective decision making by: (a) looking at a decision from all points of view; (b) selecting the most important changes to make; (c) weighing pros and cons of a decision and by projecting likely outcomes.
Competence 核心能力	3. Upon completion of this course, you will be equipped to: (a) understand the theory, practice and outcomes of various design-led innovation methods. (b) determine appropriate methods to gather useful data for the task at-hand. (c) synthesize and present process, finding, and reflection about practiced methods in a meaningful way. (d) develop a research plan to drive innovation in a defined area. (e) demonstrate an ability to work collaboratively and facilitate participatory activities. (f) visually communicate process, outcomes and insights through info graphics and/or data visualizations. (g) collaborate with others and show respect for their differences. (h) express civic identity and how service integrates into his or her larger identity.
Prerequisite Course(s) 先修課程或先備能力	4. All the participants would have to attend my undergraduate courses in the past 5. All the participants would be familiar with multimedia design relevant professional skills such as Photoshop, Illustrator, Flash, 3D Max, Uniity etc. 6. Only for Multimedia Design Department students
Teaching Strategies 教學方法	Oral presentations and interactive discussions
Course Material 課程教材	Teacher’s prepared materials
Grading 評量方式	3. Grades will be determined by a student's performance on a midterm (15%), a final (20%), individual written assignments (20%), and a group project and assignments (45%). The project grades will be as a result of 1) individual presentations, 2) demos, 3) project write-ups, and 4) ratings given by the other members of the project team. The class will *not* be graded on a curve. The final grades will be determined by the standard scale of 90% = A-, 80% = B-, etc. 4. Individual homework should be done independently. It is fine to discuss the general techniques and methods required, but you must do your own work in solving the problems and writing up the solutions. *Cheating will not be excused* and will lead to failure in the course. After you turn in your individual homework, you may use this

	information in the group, combined with others homework, to aid in the project redesigns.
References 參考書目	1. 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization by Vijay Kumar 2. Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions by Bruce Hanington and Bella Martin
Contact with Teacher 老師聯絡資訊	My research office is located in A&H building 5TH Floor. Office telephone: 05-631-5878 Email: stshen@nfu.edu.tw

Course Outline 課程進度	
Lecture Week 1-2: Course Introduction Lecture Week 3: Discussion about Design Thinking/Methods Lecture Week 4: Discussion about Design Thinking/Methods Lecture Week 5: Visualization Techniques Lecture Week 6-7: Visualization Techniques Lecture Lecture Week 8: Visualizing and finalizing the work Week 9: Mid Term Exam	Lecture 10-11: Intro to Analysis phase (I) Lecture 12: Intro to Analysis phase (II) Lecture 13: Intro to Evaluation phase Lecture 14-15: Preparing and Working with the intended presentation Lecture 16-17: Visualising and finalizing the work Week 18 Final Term Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Human-Computer Interaction Design (人機介面互動設計)
Course Description 課程概述	Human-Computer Interaction (HCI) is concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. On the practical side, this means the principles and methods with which one builds effective user interfaces. A basic precept of HCI is that users should be able to get things done through the computer, without having to pay attention to the intricacies of complex software. Interfaces must be accessible, meaningful, visually consistent, comprehensive, accurate, and oriented around the tasks that users tend to perform. The course will provide a balance of practical and theoretical knowledge, giving students experience ordinarily not provided by other

	courses in the field of multimedia design. Practical concerns will be balanced by discussion of relevant theory from the literature of computer science, cognitive psychology, and industrial design. You will solve problems in homework assignments and on-campus students will participate in group projects to design, implement, and evaluate user interfaces. On completion of this course, you should have (a) practical skills for user interface design, (b) an understanding of the human side of computing, (c) the background to apply theoretical and empirical techniques in HCI, and (d) a good overview of the field.
Course objective 課程目標	On completion of this course according to course **goals**, the student should be able to: • understand the basics of human and computational abilities and limitations. • understand basic theories, tools and techniques in HCI. • understand the fundamental aspects of designing and evaluating interfaces. • practice a variety of simple methods for evaluating the quality of a user interface. • apply appropriate HCI techniques to design systems that are usable by people.
Competence 核心能力	*Definition*: students will be able to recognize and recall terminology, facts and principles For example, students can define 'direct manipulation' and list some of its strengths and weaknesses as an interaction style. *Concept Understanding*: students will be able to determine the relationships between specific instances and broader generalizations. For example, students can determine which parts of a system exhibit direct manipulation features and can explain why a change in the system produced different properties. *Directed Application*: students will be able to use concepts and principles to explain, analyze and solve specific situations, often with the applicable concepts implicit in the setting. For example, students can redesign part of an interface to exhibit direct manipulation style and predict the likely effects of the change. *Realistic Problem Solving*: students will be able to apply course content in coping with real life situations. These differ from directed applications by having less structured questions and issues, no direction as to which concepts will be applicable and a range of potentially acceptable answers. For example, students can design an interface for real tasks and users which incorporates direct manipulation in appropriate ways (and evaluate/defend their choices).
Prerequisite Course(s) 先修課程或先備能力	7. All the participants would have to attend my undergraduate courses in the past 8. All the participants would be familiar with multimedia design relevant professional skills such as Photoshop, Illustrator, Flash, 3D Max, Uniity etc. 9. Only for Multimedia Design Department students

Teaching Strategies 教學方法	Oral presentations and interactive discussions
Course Material 課程教材	Teacher's prepared materials
Grading 評量方式	5. Grades will be determined by a student's performance on a midterm (15%), a final (20%), individual written assignments (20%), and a group project and assignments (45%). The project grades will be as a result of 1) individual presentations, 2) demos, 3) project write-ups, and 4) ratings given by the other members of the project team. The class will *not* be graded on a curve. The final grades will be determined by the standard scale of 90% = A-, 80% = B-, etc. 6. Individual homework should be done independently. It is fine to discuss the general techniques and methods required, but you must do your own work in solving the problems and writing up the solutions. *Cheating will not be excused* and will lead to failure in the course. After you turn in your individual homework, you may use this information in the group, combined with others homework, to aid in the project redesigns.
References 參考書目	3. Dix A. et al., Human-Computer Interaction. Harlow, England: Prentice Hall, 2004, ISBN-10: 0130461091 4. Yvonne Rogers, Helen Sharp, Jenny Preece, Interaction Design: Beyond Human Computer Interaction, 3rd Edition, Wiley, 2011, ISBN-10: 0470665769
Contact with Teacher 老師聯絡資訊	My research office is located in A&H building 5TH Floor. Office telephone: 05-631-5878 Email: stshen@nfu.edu.tw

Course Outline 課程進度	
Lecture Week 1-2: Introduction to Human-Computer Interaction/Semester project and student teams Lecture Week 3: Task-centred system design: task-centered process, development of task examples, evaluation of designs through a task-centered walk-through Lecture Week 4-5: User-centred design and prototyping: assumptions, participatory design, methods for involving the user, prototyping, low fidelity prototypes, medium fidelity prototypes, wizard of Oz examples Lecture Week 5-6: Methods for evaluation of interfaces with users: goals of evaluation, approaches, ethics, introspection, extracting the conceptual model, direct observation, constructive	Lecture Week 10-11: Beyond screen design: characteristics of good representations, information visualization, Tufte's guidelines, visual variables, metaphors, direct manipulation Lecture Week 12-13: Graphical screen design: graphical design concepts, components of visible language, graphical design by grids Lecture Week 14-15: Design principles and usability heuristics: design principles, principles to support usability, golden rules and heuristics, HCI patterns Lecture Week 16: HCI design standards: process-oriented standards, product-oriented standards, strengths and limitations of HCI Standards

interaction, interviews and questionnaires, continuous evaluation via user feedback and field studies, choosing an evaluation method Lecture Week 7-8: Psychology of everyday things: psychopathology of everyday things, examples, concepts for designing everyday things Week 9: Mid Term Exam	Lecture Week 17: Past and future of HCI: the past, present and future, perceptual interfaces, context-awareness and perception Lecture Week 18 Final Term Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Digital Media Communication (數位媒體傳播)
Course Description 課程概述	This course will examine "social media" from a cultural perspective, with a focus on how media technologies figure in practices of everyday life and in the construction of social relationships and identities. We will work from an expansive definition of what constitutes "social media," considering social network sites, smartphone apps, and online games, among other technologies. Questions we will consider include: What tools can we use to study the place of social media in culture? How can social media enable the formation of community? How is identity performed in/with social media? How are constructions of youth, gender, race, ethnicity, and sexuality mediated through social media technologies? Can social media technologies be a vehicle for political activism? What are the commercial uses of social media? What are the ethical issues associated with social media technologies? Is it possible to refuse social media? The course itself will involve communication in social media channels in addition to the traditional seminar format, thus we will be actively participating in the phenomena under study as we go.
Course objective 課程目標	Upon the successful completion of this course, students should be able to: • Identify and critique instances of technological determinism in popular discourse on social media technologies • Critically evaluate methodologies employed by studies of social media use Describe social media practices among various social groups, differentiated by age, gender, race, and sexual identity, among others • Understand performances of identity in social media • Critically evaluate the potential for social media technologies to facilitate the formation of identities, communities, activist movements, and consumer markets • Articulate some of the ethical problems posed by emerging social media

	technologies Apply each of the above skills and concepts to their own real-life observations of social me
Competence 核心能力	Upon completing this course, students can expect to gain digital skills and knowledge, as demonstrated by: 4. Authoring and maintaining a WordPress blog throughout the semester on a specific topic of his/her choice 5. Applying concepts learned in class to self-promote his/her blogs using social media 6. Completing assessments on topics explained in lecture and online materials 7. Utilizing skills explained in online and in-class tutorials, like HTML and iMovie to complete digital media projects 8. Writing a reflection on his/her course experience 9. Creating an effective online brand and presence 10. A collection of writing samples and multimedia projects to be used in a senior portfolio
Prerequisite Course(s) 先修課程或先備能力	N/A
Teaching Strategies 教學方法	Oral presentations and interactive discussions
Course Material 課程教材	Baym, N. (2010). Personal Connections in the Digital Age. Cambridge, UK: Polity
Grading 評量方式	This digital media communication course is designed to build skill, and an essential part of that skill-building is practicing and questioning. Your participation during the class lectures, and your reading of other students' participatory questions and trials, is therefore an essential element of learning. In the weekly schedule for our class contained at the bottom of this syllabus, you'll notice that I ask you to participate by answering questions and posting information during each lecture. To gain credit for that participation, you should make your contributions *during the week that a lecture is introduced*: the specific due date for participation is listed in each week's schedule. Informed, prepared, thoughtful, active participation in class activities and discussion, in a manner that is respectful of and responsive to your peers, will result in a high class participation grade. Carelessness, lack of preparation, inactivity, unresponsiveness and disrespect toward peers will lead to a lower class participation grade. You must positively engage to earn a score. Scores will range from 100 (Outstanding) to 90 (Excellent) to 80 (Good) to 70 (Acceptable) to 60 (Unacceptable) to 0 (None).
References 參考書目	N/A
Contact with	My research office is located in A&H building 5TH Floor.

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Course Outline 課程進度	
Lecture Week 1-2: Course Introduction Lecture Week 3: Define personal connections in the digital age and its history Lecture Week 4: Studying social media networks Lecture Week 5: Forming relationships and community through social media Lecture Week 6-7: Forming relationships and community, continued. Lecture Week 8: Performing identity through social media Week 9 Mid Term Exam	Lecture 10: Performing identity though social media, continued. Lecture 11: Youth and discourse about social media Lecture 12: Gender and sexuality issues Lecture 13: Race, ethnicity, and class Lecture 14: Ethical issues Lecture 15: Social media activism Lecture 16: Social media and political participation Lecture 17: Learning about and reaching customers Week 18 Final Term Exam

Remarks 備註	Only for Multimedia Design Department’s students