110/1 Courses taught in English(110 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	Weekly 每週上課節次					Classroom 上課教室	Course Description 課程說明
							Mon	Tue	Wed	Thu	Fri		
1	Department of power mechanical engineering 動力機械工程系	2594	Practical Transmission Engineering 傳動工程實務	Elective 選修	3	Long-Chang, Hsieh 謝龍昌		7-9				(BGB0514) Second Assembly Building 5th floor creation Classroom.綜合工程二館 5F BGB0514 創意教室	Course Outline
2	Department of power mechanical engineering 動力機械工程系	2595	Biosolid Mechanics 生物力學	Elective 選修	3	I-En,Lin 林依恩			7-9			(BGB0703) Second Assembly Building 7th floor Lecture Hall 綜合工程二館 7F BGB0703 階梯教室	Course Outline
3	Department of power mechanical engineering 動力機械工程系	2597	Micro Nano Manufacturing and Testing 微奈米製造與檢測	Elective 選修	3	Chin-Chung,Wei 魏進忠				5-7		(BGB0703) Second Assembly Building 7th floor Lecture Hall 綜合工程二館 7F BGB0703 階梯教室	Course Outline
4	Department of power mechanical engineering 動力機械工程	2599	Nonlinear System Analysis 非線性系統分析	Elective 選修	3	Yunn-Lin, Hwang 黃運琳		2-4				(BGA0760) First Assembly Building 7th floor Reverse rapid prototyping	Course Outline

	系											laboratory 綜合工程一館 7F BGA0760 逆向快速成型實驗室	
5	Department of power mechanical engineering 動力機械工程系	2600	Dynamics of Multibody Systems 多體動力學	Elective 選修	3	Yunn-Lin, Hwang 黃運琳				2-4		(BGA0760) First Assembly Building 7th floor Reverse rapid prototyping laboratory 綜合工程一館 7F BGA0760 逆向快速成型實驗室	Course Outline
6	Institute of Material Science and Green Energy Engineering （材料科學與綠色能源工程研究所碩士班）	0230	Semiconductor Devices and Manufacturing Process 半導體元件與製程	Elective 選修	3	Fang, Jau-Shiung 方昭訓	2-4					3F Building of Mechanical Engineering (AME0324) 機械工程館 3F AME0324 預備教室(三)	Course Outline
7	Institute of Material Science and Green Energy Engineering （材料科學與綠色能源工程研究所碩士班）	0217	Thermodynamics of Solids 固態熱力學	Required 必修	3	Tsai, Chau-Yi 蔡朝伊	5-7					(AME0324) Spare classroom 3, 3F, Mechanical Engineering Building (AME0324) 機械工程館 3F 預備教室(三)	Course Outline
8	Department of Electrical Engineering （電機工程系）	0134	FPGA Circuits Design FPGA 電路設計	Elective 選修	3	SUN, CHI-CHIA 宋啟嘉				2-4		BEE0502; Network Application and Chip Design Lab.	Course Outline

												5F, Electrical Engineering Building 電機館 5F BEE0502 網路應用與晶片設計實驗室	
9	Department of Electrical Engineering （電機工程系）	0138	Embedded Systems 嵌入式系統	Elective 選修	3	SU, HUI-KAI 蘇暉凱	5-7					BEE0402; Intelligent Electronic and Application Lab. 4F, Electrical Engineering Building 電機館 4F BEE0402 智慧電子應用實驗室	Course Outline
10	Department of Electrical Engineering （電機工程系）	0141	Electronic Circuit Design Practice 電子電路設計實務	Elective 選修	3	Wu,Sen-Tung 吳森統		7-9				BEE0105; 1F, Lighting Laboratory 電機館 1F BEE0105 照明實驗室	Course Outline
11	Department of Automation Engineering 自動化工程系	0053	Autonomous Unmanned Vehicle System 自動化無人載具系統	Elective 選修	3	LI ,MENG TSE 李孟澤	2-4					Seminar Room, 3F BGA0340, Hall 1 of Comprehensive Engineering 綜合工程一館 3F BGA0340 研討室	Course Outline
12	Department of Automation Engineering 自動化工程系	0052	Application for Digital Image Processing 數位影像處理實	Elective 選修	3	LEE ,KUANG-CHYI 李廣齊		8-10				AIA0201 Information Building 2F 資訊大樓 2F	Course Outline

			務									AIA0201 普通教室	
13	Electro-Optical and Materials Science (光電工程系光電與材料科技碩士班)	0289	Electro-Optics Semiconductor Devices 光電半導體元件	Elective 選修	3	Fuh-Shyang Juang 莊賦祥				2-4		（BGAB160）Classroom4,First Assembly Building B1 綜合工程一館 B1 BGAB160 預備教室四	Course Outline
14	Institute of Computer Science and Information Engineering（資訊工程系碩士班）	0118	Technical Research Writing 科技論文寫作	Required 必修	3	Po-Hsiang Tsai 蔡柏祥			2-4			BGC0305 Embedded System Software Design Lab. 嵌入式系統軟體實驗室	Course Outline
15	Institute of Information Management(資訊管理系碩士班)	0094	Business Intelligence t 商業智慧	Electives 選修	3	Yung-Tsung Hou 侯雍聰	7-9					(CMA0614)., Applied Arts, Sciences and Management Building 6F 文理暨管理大樓 6F CMA0614 企業電子化實驗室	Course Outline
16	Institute of Information Management (資訊管理系碩士班)	0096	ETL and Modeling for Big data 大數據彙整與建模	Electives 選修	3	Nian-Ze Hu 胡念祖				5-7		(CMA0405)., Applied Arts, Sciences and Management Building 4F 文理暨管理大樓 4F CMA0405 多媒體電腦教室	Course Outline
17	Institute of Information	0097	Web Technology Web 技術	Electives 選修	3	Y-F Lan	2-4					(CMA0405)., Applied Arts, Sciences and	Course Outline

	Management (資訊管理系碩士班)					藍友烽						Management Building 4F 文理暨管理大樓 4F CMA0406 企業電子化電腦教室	
18	Department of Finance (財務金融系碩士班)	0036	Programming for Securities Trading 證券交易程式設計	Elective 選修	3	Tsai, Feng-Tse 蔡豐澤	5-7					(CHB0207) Certificate Center, Art and Humanity Building 2F 人文大樓 2F CHB0207 證照中心	Course Outline
19	Institute of Business and Management （經營管理碩士班）	0357	Marketing Management 行銷管理	Elective 選修	3	Mam-Shin Cheng 鄭錳新		6-8				(CMA0209) Management of Entrepreneurial &Technology Lab., Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0209 創業管理實驗室	Course Outline
20	Institute of Business and Management （經營管理碩士班）	0358	Business Data Analysis 企業資料分析	Elective 選修	3	Liang, Chih-Chin 梁直青			2-4			CMA0206)Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0206 市場調查實驗室	Course Outline

21	Institute of Business and Management（經營管理碩士班）	0355	Corporate Financial Management 公司財務管理	Elective 選修	3	Chi-Lin Lu 呂麒麟					2-4	(CMA0209) Management of Entrepreneurial &Technology Lab., Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0209 創業管理實驗室	Course Outline
22	Institute of Business and Management（經營管理碩士班）	0372	Global Marketing 全球化行銷	Elective 選修	3	Yi Hsu 徐怡			5-7			(CMA0206) Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0206 市場調查實驗室	Course Outline
23	Institute of Business and Management（經營管理碩士班）	0373	Entrepreneurship 創業管理	Elective 選修	3	Yu-Chun Chen 陳鈺淳	2-4					(CMA0209) Management of Entrepreneurial &Technology Lab., Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0209 創業管理實驗室	Course Outline
24	Institute of Business and Management	0371	Motivation and Leadership 激勵與領導	Elective 選修	3	Ching-Hsiang Liu 劉慶湘			2-4			(CMA0209) Management of Entrepreneurial &Technology Lab.,	Course Outline

	（經營管理碩士班）											Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0209 創業管理實驗室	
25	Institute of Industrial Engineering and Management（工業管理系工業工程與管理碩士班）	0322	Seminar(一) 專題討論(一)	Required 必修	0	Hu ,Chih-Hsiung 胡智熊		3-4				Seminar Room III (CMA0806) Applied Arts, Sciences and Management Building 8F 文理暨管理大樓 8F CMA0806 專業教室（三）	Course Outline
26	Institute of Industrial Engineering and Management（工業管理系工業工程與管理碩士班）	0323	Quantitative Research Methodology 數量研究方法	Required 必修	3	Hu ,Chih-Hsiung 黃俊平		2-4				Seminar Room III (CMA0806) Applied Arts, Sciences and Management Building 8F 文理暨管理大樓 8F CMA0806 專業教室（三）	Course Outline
27	Institute of Industrial Engineering and Management	0325	Data Mining 資料探勘	Elective 選修	3	Ying-Lien Lee 李英聯		2-4				Business Intelligence Room (CMA0305) Applied Arts,	Course Outline

	（工業管理系 工業工程與管理碩士班）											Sciences and Management Building 3F 文理暨管理大樓 3F CMA0305 企業智慧教室	
28	Institute of Industrial Engineering and Management （工業管理系 工業工程與管理碩士班）	0324	Simulation 模擬學	Elective 選修	3	Hu ,Chih-Hsiung 胡智熊			2-4			Seminar Room III (CMA0806) Applied Arts, Sciences and Management Building 8F 文理暨管理大樓 8F CMA0806 專業教室（三）	Course Outline
29	Graduate Institute of Digital Contents and Creative Industries (多媒體設計系 數位內容創意產業研究所碩士班)	0170	Project Discussions (I) 專題討論(一)	Required 必修	2	Shen, Siu-Tsen 沈思岑				3-4		(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗	Course Outline
30	Graduate Institute of Digital Contents and Creative	0171	Design Research Methods 研究方法特論	Required 必修	3	Shen, Siu-Tsen 沈思岑		5-7				(CHB0305) Multimedia Design Studio, Art and Humanity	Course Outline

	Industries (多媒體設計系數位內容創意產業研究所碩士班)											Building 3F 人文大樓三樓 多媒體設計實驗	
31	Graduate Institute of Digital Contents and Creative Industries (多媒體設計系數位內容創意產業研究所碩士班)	0172	Human-Computer Interaction Design 人機介面互動設計研究	Elective 選修	3	Shen, Siu-Tsen 沈思岑				5-7		(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗	Course Outline
32	Graduate Institute of Digital Contents and Creative Industries (多媒體設計系數位內容創意產業研究所碩士班)	0179	Digital Media Communication 數位媒體傳播	Elective 選修	3	Shen, Siu-Tsen 沈思岑		2-4				(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗驗室 CHB0305	Course Outline
33	Graduate Institute of Digital Contents and Creative Industries	0173	Research in Digital Media Arts 數位媒體藝術研究	Elective 選修	3	Wen-Hwa ,Cheng 鄭文華	2-4					(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F	Course Outline

	(多媒體設計系數位內容創意產業研究所碩士班)											人文大樓三樓 多媒體設計實驗	
34	Leisure Recreation Institute (休閒遊憩系碩士班)	0190	Sustainable Tourism 永續觀光	Elective 選修	3	Lin,Chung-Hsien 林宗賢		5-7				(CMA0103) Community Empowering Classroom Arts, Science and Management Building 1F 文理暨管理大樓 1F 社區營造教室	Course Outline
35	Institute of Department of Biotechnology (生物科技系)	2243	Analysis Chemistry 分析化學	Required 必修	2	Jenn-Feng Sheen 沈振峯			3-4			ATB0204, General Classroom, 2nd Teaching Building 2F 第二期教學大樓 2F ATB0204	Course Outline
36	Institute of Department of Biotechnology (生物科技系)	2256	Analysis Chemistry 分析化學	Required 必修	2	Jenn-Feng Sheen 沈振峯		3-4				ATB0204, General Classroom, 2nd Teaching Building 2F 第二期教學大樓 2F ATB0204	Course Outline
37	Institute of Department of	2242	Biostatistics 生物統計學	Required 必修	2	Chia-Hsiang Lai 賴嘉祥				1-2		ATB0403, General Classroom,2nd	Course Outline

	Biotechnology (生物科技系)											Teaching Building,4F 第二期教學大樓 4F ATB0403	
38	Institute of Department of Biotechnology (生物科技系)	2255	Biostatistics 生物統計學	Required 必修	2	Chia-Hsiang Lai 賴嘉祥					7-8	ATA0402, General Classroom, 1st Teaching Building 4F 一期大樓 4F ATA0402	Course Outline
39	Institute of Department of Biotechnology (生物科技系)	2247	Food Microbiology 食品微生物學與實習	Elective 選修	3	Chung-Yi Wang 王鐘毅					2-4	(AME0415) Biotechnology Lab. ,Mechanical engineering Building 4F 機械工程館 4F 生物技術實驗室 AME0415	Course Outline
40	Institute of Department of Biotechnology (生物科技系碩士班)	0156	Principle and Technology of Molecular Biology 分生技術與原理	Elective 選修	3	Chi-Chung Peng 彭及忠			5-7			(AGR0429) Seminar Room III, Red Building 4F 紅樓二樓 專題討論室(三) (AGR0429)	Course Outline

Courses taught in English

Course title 課程名稱	Practical Transmission Engineering （傳動工程實務）
Course Description 課程概述	1. Introduction of transmission systems. 2. Basic principles of transmission systems. 3. Kinematics of transmission systems. 4. Learn how to design the transmission systems for special purpose.
Course objective 課程目標	Teaching students to understand the basic principles of transmission systems, and further to learn how to design the transmission systems for special purpose.
Competence 核心能力	1. Understand the basic principles of mechanisms. 2. Have the ability of innovate new mechanisms to avoid the relevant patent.
Prerequisite Course(s) 先修課程或先備能力	Mechanisms 機構學
Teaching Strategies 教學方法	1. Classroom teaching 2. Case study 3. Problem-guided learning 4. Project-guided learning
Course Material 課程教材	Mechanisms and dynamics of machinery (Hamilton F. Mabie and Charles F. Reinholtz, John Wiley & Sons, Singapore.)
Grading 評量方式	1. Test (50%) 2. Paper reading and presentation (20%) 3. Project presentation (30%)
References 參考書目	Mechanisms-Theory and applications (Hong-Sen Yan, McGraw Hill, Singapore.)
Contact with Teacher 老師聯絡資訊	Long-Chang Hsieh (謝龍昌) Professor 0910-764467

Course Outline 課程進度	
Chapter 1 Introduction 1.1 Belts and chains 1.2 Gear transmission 1.3 Fluid transmission 1.4 Frictional transmission 1.5 Clutches and Brakes **Chapter 2 Gear mechanism**	

7.2 Existing design 7.3 Innovative design 7.4 Kinematic design 7.5 Conclusion **Chapter 8 The Systematic Design of Planetary-Type Grinding Devices for optical fiber ferrules and wafers** 8.1 Introduction 8.2 Grinding Devices 8.3 Kinematic Equations 8.4 Area Ratio 8.5 Design examples 8.7 Conclusion	
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) 先修課程或先備能力	Stress Analysis, Advance Engineering Mathematics, Finite Element Analysis
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	Micro-Nano Fabrication and Measurement (微奈米製造與檢測)
Course Description 課程概述	Micro and nano scale fabrication are became more important in applications and technologies. Thin film is wildly used on sensors, tools, and composite materials. These applications gradually change our life in transmission devices, intelligent control, energy… etc. The course will introduce applications and methods of micro-nano fabrication, and how to measure relative properties.
Course objective 課程目標	The purpose of the course is to build the basic concept of micro-nano fabrication and measurement for graduates and PHD students. How to process fabrication and properties measurements. Industry application and experiments are also included in order to strengthen the studying effect.
Competence 核心能力	Basic physical and chemical concepts.
Prerequisite Course(s) 先修課程或先備能力	Basic physics and chemistry
Teaching Strategies 教學方法	1. Teaching by slides 2. Video 3. Practice (solar cell, hardness measuring) 4. Laboratory visit
Course Material 課程教材	Self-edition material
Grading 評量方式	1. regular test 20% 2. Mid test 30% 3. Homework 20% 4. Final presentation and report 30%
References 參考書目	Non
Contact with Teacher 老師聯絡資訊	Dr. Chin-Chung Wei Email: ccwei@nfu.edu.tw Phone:+88656315414

Course Outline 課程進度	
A. Fabrication Technology (Before Mid test) B. Measuring Technology (After Mid test)	1. Introduction to nano technology 2. Atomic force microscopy measurement and fabrication 3. Coating and modification 4. MEMS process 5. Mechanical properties measurement by micro-nano method 6. Surface morphology and residual stress measurement 7. Material structure and elements measurement
Remarks 備註	

Courses taught in English

Course title 課程名稱	Nonlinear System Analysis (非線性系統分析)
Course Description 課程概述	This course covers model generation, parameter identification, balancing of mechanical systems, torsional and bending vibrations, vibration isolation, and the dynamic behaviors of drives and machine frames as complex systems.
Course objective 課程目標	Let students understand “Nonlinear System Analysis” in the applications of industry.
Competence 核心能力	Mature, Stable and Computational abilities.
Prerequisite Course(s) 先修課程或先備能力	Dynamics and Mechanics of Materials.
Teaching Strategies 教學方法	Course Notes, Computer Simulation, and Report Writing.
Course Material 課程教材	Lecture notes.
Grading 評量方式	Quiz, Mid-term Examination, Final Examination, and Final Project.

References 參考書目	1. Shabana, Ahmed A., 1991, Theory of Vibration Volume II: Discrete and Continuous Systems , Springer-Verlag, Inc.
Contact with Teacher 老師聯絡資訊	Yunn-Lin Hwang/黃運琳 hwang@nfu.edu.tw TEL: 05-6315339

Course Outline 課程進度	
1. Introduction 2. Solutions of the Nonlinear Vibration Equations 3. Free Vibration of Single Degree of Freedom Nonlinear Systems 4. Forced Vibration of Single Degree of Freedom Nonlinear Systems	5. Response to Nonharmonic Forces of Nonlinear Systems 6. Multi-Degree of Freedom Nonlinear Systems 7. Introduction of vibration measurements

Remarks 備註	

Courses taught in English

Course title 課程名稱	Dynamics of Multibody Systems (多體動力學)
Course Description 課程概述	Multibody system is the study of the dynamic behavior of interconnected rigid or flexible bodies, each of which may undergo large translational and rotational displacements.
Course objective 課程目標	Let students understand “dynamics of multibody systems” in the applications of industry.
Competence 核心能力	Mature, Stable and Computational abilities.
Prerequisite Course(s) 先修課程或先備能力	Statics, Dynamics and Mechanics of Materials.
Teaching Strategies 教學方法	Course Notes, Computer Simulation, and Report Writing.
Course Material 課程教材	Shabana, Ahmed A., 2005, *Dynamics of Multibody Systems*, Cambridge University Press.
Grading 評量方式	Quiz, Mid-term Examination, Final Examination, and Final Project.

References 參考書目	1. Wittenburg, Jens, 2008, *Dynamics of Multibody Systems*, Springer-Verlag Berlin Heidelberg. 2. Nikravesh, Parviz E., 1988, *Computer-Aided Analysis of Mechanical Systems*, Prentice-Hall, Inc. 3. Shabana, Ahmed A., 2001, *Computational Dynamics*, John Wiley & Sons, Inc.
Contact with Teacher 老師聯絡資訊	Yunn-Lin Hwang/黃運琳 E-mail: hwang@nfu.edu.tw TEL: 05-6315339
Course Outline 課程進度	
Outline: 1. Introduction 2. Reference kinematics 3. Analytical techniques 4. Mechanics of deformable bodies 5. Classical approximation methods 6. Finite-element formulation 7. Computer implementation	
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	Lecturing in class

教學方法	
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	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	Explaining, describing and demonstration in class

教學方法	
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	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) 先修課程或先備能力	HDL Language (VHDL or Verilog) CPLD/FPGA Implantation
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	1. Training the basic concepts of embedded system development. 2. Training the basic skills of driver programming and application programming for

課程目標	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	Electronic Circuit Design Practice (電子電路設計實務)
Course Description 課程概述	The main purpose of this course is to help master students for electrical circuits design. The field of this course will not only focus on circuit analysis, but also includes some specific protection circuit and sensors applications. This course is

	suitable for EE background, especially for hardware circuit designers.
Course objective 課程目標	1. Students can design an electrical circuit for a system. 2. Students can use sensors to extend the function of circuits. 3. Student can study datasheets and related information to create a system or circuit .
Competence 核心能力	Analysis and logical ability are expected.
Prerequisite Course(s) 先修課程或先備能力	1. Electronics 2. Electrical Circuits
Teaching Strategies 教學方法	1. Group discussion(小組討論) 2. Learn by practices(實作練習) 3. Didactic Teaching(講述式教學) 4. Team Teaching(協同教學)
Course Material 課程教材	1. SCI Journal papers 2. Technical books 3. Textbook
Grading 評量方式	1. 60% Participation, Assignments 2. 20% Midterm 3. 20% Final term
References 參考書目	Engineering Circuit Analysis ISBN：9781118960639
Contact with Teacher 老師聯絡資訊	e-mail:stwu@nfu.edu.tw Phone:05-631-5613

Course Outline 課程進度

1.Basic theory for electrical circuits
2.Components stress and characteristics
3.Power amplifier circuit
4.Filter design
5.Protection circuit
6.AC circuits
7.DC circuits
8.Sensors circuits
9.Commercial integrated circuits
10.Switch driver
11.Final project

The schedule above is adjustable with the studying progress.

Course Rules need to obey

1. Smart phones and laptops are available for vocabularies searching in class. Gaming is NOT ALLOWED in class. 2. Students need to be concentrated in class. The appropriate discussion is allowable. 3. The course is suitable for students with engineering background only (this course is also suitable for graduated students).	
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)	Calculus, Engineering Mathematics

先修課程或先備能力	
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	Electro-Optics Semiconductor Devices （光電半導體元件）
Course Description 課程概述	This course introduces the theorems in Electro-Optics Semiconductor Devices, such as the basic understanding of Semiconductor Science and Light-Emitting Diodes, Energy Band Diagrams, Density of States, Fermi–Dirac, *n*-Type and *p*-Type Semiconductor, *pn* Junction Band Diagram, Light-Emitting Diodes: Principle Homojunction LEDs, Heterostructure High-Intensity LEDs, Quantum Well High-Intensity LEDs.
Course objective 課程目標	The students will understand the principle and applications of Electro-Optics Semiconductor Devices. They also will learn LED Materials and Structures, Light extraction from a bare LED chip, LED Efficiencies and Luminous Flux, LED brightness, Basic LED Characteristics.
Competence 核心能力	Semiconductor Physics and Light-Emitting Diodes, Technology of LED Lighting and mini LED display.

Prerequisite Course(s) 先修課程或先備能力	Semiconductor devices and physics
Teaching Strategies 教學方法	General lecturing and inquiry-based learning
Course Material 課程教材	Optoelectronics and Photonics-Principle and Practice, the Second edition, S. O. Kasap, Pearson Education Limited 2013
Grading 評量方式	1. Midterm exam (30%), 2. Oral Presentation (40%), 3. Final report (40%)
References 參考書目	1. Semiconductor Physics and Devices Basic Principles, Third Edition Donald A. Neamen University of New Mexico, McGraw-Hill Higher- Education, 2003. 2. Semiconductor Optics, Claus Klingshirn, University of Karlsruhe Institute of Applied Physics Wolfgang, Springer-Verlag Berlin Heidelberg 2005.
Contact with Teacher 老師聯絡資訊	TEL: 05-6315678 (Office) Email: fsjuang@nfu.edu.tw

Course Outline
課程進度

1. Review of Semiconductor Concepts and Energy Bands
2. Semiconductor Statistics
3. Extrinsic Semiconductors
4. Direct and Indirect Bandgap Semiconductors: E–k Diagrams
5. *pn* Junction Principles
6. *pn* Junction Reverse Current
7. *pn* Junction Dynamic Resistance and Capacitances
8. Recombination Lifetime
9. *pn* Junction Band Diagram
10. Heterojunctions
11. Light-Emitting Diodes: Principles
12. Quantum Well High-Intensity LEDs
13. LED Materials and Structures
14. LED Efficiencies and Luminous Flux
15. Basic LED Characteristics
16. LEDs for Optical Fiber Communications
17. Phosphors and White LEDs

Remarks 備註	

Courses taught in English

Course title 課程名稱	Technical Research Writing (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 教學方法	Lecturing with Slides and Whiteboard
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	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	Programming for Securities Trading (證券交易程式設計)
Course Description 課程概述	This course introduces programming knowledge and techniques adopting Python that can be used to particularly in algorithmic trading. Students will be able to write Python codes to complete algorithmic tasks in finance and securities trading.
Course objective 課程目標	The objective of this course is to help students understand the logic of algorithm using Python. Through coding, students will learn how to solve financial problems with Python.
Competence 核心能力	Programming
Prerequisite Course(s) 先修課程或先備能力	None
Teaching Strategies 教學方法	Lecture, practice, assignments, projects, exams
Course Material 課程教材	Handouts, some online materials
Grading 評量方式	Mid-term exam 30%, Final exam & projects 40%, participation, assignments 30%
References 參考書目	Python for Finance
Contact with Teacher 老師聯絡資訊	05-6313353 ftsai@nfu.edu.tw
Course Outline	

課程進度	
Week 1 Week 2-6 Week 7-8 Week 10 12 Week 13 15 Week 16-18	1.Set up a proper Python environment for programming 2.Learn program syntax by examples 3.Handle exceptions and errors 4.Write functions and classes 5.Use packages: NumPy and Pandas 6.Work on projects
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 (2012), Marketing Management, 14th 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 老師聯絡資訊	chihchin@nfu.edu.tw

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 4.valuation of bond 5.valuation of stock	1An Overview of Finance	
	2Financial Background	
	3Cash flow and financial analysis	
	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 教學方法	Lecture; Case Discuss; Field Trip
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. At the end of the semester, students are asked to team up to participate entrepreneurial competitions which will help students to integrate and apply theoretical tools in a practical way.
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	Blank, S., & Dorf, B. (2012). The startup owner's manual: The step-by-step guide for building a great company.
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	Fortune, Forbes, Harvard Business Review, Sloan Management Review, California Management Review, Bloomberg Businessweek, Inc., Entrepreneur, and Fast Company.

Contact with Teacher 老師聯絡資訊	

Course Outline 課程進度	
Module 1: Exploring innovation Module 1.1 Dynamics of technological innovation Module 1.2 Industrial implications of technological innovation Module 1.3 Competitive implications of market and technology dynamics **Module 2: The process of entrepreneurship** Module 2.1 Opportunities recognition Module 2.2 Develop business concept and business model Module 2.3 Market evaluation and risk assessment Module 2.4 Company life cycle **Module 3: The variety of entrepreneurship** Module 3.1 Cases of Entrepreneurs in Silicon Valley Module 3.2 Cases of Entrepreneurs in Israel Module 3.3 Cases of Entrepreneurs in Taiwan Module 3.4 Cases of Entrepreneurs in China **Module 4: Practice of entrepreneurship** Module 4.1 Resources for Entrepreneurs in Taiwan Module 4.2 Entrepreneurial Competition	

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	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 老師聯絡資訊	Email:jphuagn@nfu.edu.tw Tel:05-6315714

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	Simulation (模擬學)
Course Description 課程概述	This course is intended to give an up-to-date treatment of all the important aspects of simulation modeling study and applications, including discrete event simulation methodology, introduction of simulation languages, and statistical aspects of simulation. About 40% of class time will be devoted to simulation software learning.
Course objective 課程目標	1. To be able to do simulation 2. To understand the development of simulation and simulation-related research.
Competence 核心能力	Simulation Programming Ability Problem Formulation Ability
Prerequisite Course(s) 先修課程或先備能力	Statistics Any programming Language
Teaching Strategies 教學方法	Lecture Software Practice Literature Review
Course Material 課程教材	Getting start with Automod Computer Simulation in Management Science
Grading 評量方式	Homework 60% Final Project 30% Participation 10%
References 參考書目	
Contact with Teacher 老師聯絡資訊	chh@nfu.edu.tw

Course Outline 課程進度	
Introduction Simulation Package-AutoMod	Computer Simulation in Management Science Simulation Literature Review

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 Week 10-11: Discussions and feedbacks Lecture Week 12: Studying the second chosen topic Lecture Week 13: Analysing detailed contents and structures Lecture Week 14-15: Preparing and Working with the intended presentation Lecture Week 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	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

the work Week 9: Mid Term Exam	Week 18 Final Term Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Human-Computer Interaction Design Research （人機介面互動設計研究）
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 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 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 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	Oral presentations and interactive discussions

教學方法	
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 Teacher 老師聯絡資訊	My research office is located in A&H building 5TH Floor. Office telephone: 05-631-5871 Email: stshen@nfu.edu.tw

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

Courses taught in English

Course title 課程名稱	Research in Digital Media Arts (數位媒體藝術研究)
Course Description 課程概述	1. Introduction to applications of digital media arts. 2. Case study of digital media arts exhibition in Taiwan via book "Taiwan Digital Art E-Files" .
Course objective 課程目標	1. Exploring new media arts in Taiwan. 2. Museum exhibition case study. 3. The purpose of this course is to provide students new media arts knowledge and cross-disciplinary thinking.
Competence 核心能力	Developing knowledge of digital art and new media
Prerequisite Course(s) 先修課程或先備能力	Multimedia presentation skills required
Teaching Strategies 教學方法	Lecture and discussion
Course Material 課程教材	Taiwan Digital Art E-Files Author: Pey-Chwen Lin http://www.books.com.tw/products/0010558514
Grading 評量方式	1. participation in class: 40% 2. midterm exam 30%: implementation of project work and through written examination 3. final exam 30%: implementation of project work and through written examination (or written report or presentation)
References 參考書目	
Contact with Teacher 老師聯絡資訊	whcheng@nfu.edu.tw

Course Outline 課程進度	
1. Week 1: Syllabus 2. Week 2: Lecture/ Lecture & Discussion:	10. Week10: Lecture/ Lecture & Discussion: Chapter3- New Education

Chapter1- New Aesthetics 3. Week3: Lecture/ Lecture & Discussion: Chapter1- New Aesthetics 4. Week4: Lecture/ Lecture & Discussion: Chapter2- New Vision 5. Week5: Lecture/ Lecture & Discussion: Chapter2- New Vision 6. Week6: Field trip Art Museum 7. Week7: Presentation 8. Week8: Presentation 9. Week9: Midterm exam	11. Week11: Lecture/ Lecture & Discussion: Chapter3- New Body 12. Week12: Lecture/ Lecture & Discussion: Chapter4- New Body 13. Week13: Lecture/ Lecture & Discussion: Chapter4- New Media 14. Week14: Guest speech / New Media Arts 15. Week15: Lecture/ Lecture & Discussion: Chapter4- New Exhibition 16. Week16: Presentation 17. Week17: Presentation 18. Week18: Final Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Sustainable Tourism (永續觀光)
Course Description 課程概述	The aim of this course is to provide students with the knowledge and evolution of the theoretical foundations of sustainable tourism. The course focuses on the environmental, economic and social impacts of tourism development and related issues to promote the sustainable development of destinations.
Course objective 課程目標	A. To introduce the relationship between tourism and sustainable development B. To develop interesting and important research questions based on the research findings of sustainable tourism
Competence 核心能力	A. Be able to understand the theories of sustainable tourism B. Be able to explain the impacts of leisure, recreation, and tourism development
Prerequisite Course(s) 先修課程或先備能力	Multivariate Statistics, Foundations of Tourism & Travel
Teaching Strategies 教學方法	Classroom instruction, Extensive reading, Oral report
Course Material 課程教材	Weaver, D. (2006). Sustainable tourism: Theory and practice. Oxford, UK: Butterworth-Heinemann.
Grading 評量方式	A. Leading Discussion 15% B. Participation Discussion 15% C. Midterm Exam 30% D. Term Project 40%
References 參考書目	Journal articles published in Journal of Sustainable Tourism and other Tourism & Travel Journals

Contact with Teacher 老師聯絡資訊	Chung-Hsien Lin, Professor Phone: 886-5-6315893 Email: linchh@nfu.edu.tw
Course Outline 課程進度	
01	Introduction to Course
02	Foundations of Leisure and Recreation
03	Foundations of Tourism and Travel
04	Emergence of sustainable tourism
05	Issues in sustainable tourism
06	Alternative tourism
07	Conventional mass tourism
08	Term project presentation I
09	Midterm Exam
10	The facilitating sectors
11	Attractions
12	Quality control
13	Tourist destinations
14	Spatial strategies for destinations
15	Visitor management strategies for destinations
16	Ecotourism: the conscience of sustainable tourism
17	Term project presentation II
18	Final Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Analytical Chemistry (分析化學)
Course Description 課程概述	The contents contains basic conpcents of the classical chemical analysis.It include qualitative and quantitative analysis, errors, simple statitics, chemical equilibrium, gravimetric, volumetric methods. The preciptation, titration methods are introduced.
Course objective 課程目標	The objetive of this course is to give basic concepts of analytical chemistry to the studients.
Competence 核心能力	Concepts in chemical analysis. Titration methods. Data satistics, Preciptation, Chemical equilibrium calculations.

Prerequisite Course(s) 先修課程或先備能力	Genernal chemistry
Teaching Strategies 教學方法	Powpoint slides, oral presentation
Course Material 課程教材	Text Book: Introduction to Analytical Chemistry, Douglas A Skoog, et al. 2011, 1st ed.
Grading 評量方式	30% Daily, 30% Mid.Test, 40% Final Test
References 參考書目	NA
Contact with Teacher 老師聯絡資訊	05-6315495 紅樓二樓 Teacher Office

Course Outline
課程進度

Analytical Chemistry 英語課程大綱:

01. What is Analytical Chemistry?
02. Important Chemical Concepts and a Basic Approach to Chemical Equilibrium.
03. Errors, Random Errors, and Statistical Data in Chemical Analyses.
04. Gravimetric Methods of Analysis.
05. Electrolyte Effects and Equilibrium: Calculations in Complex Systems.

Mid. Test.

06. Titrations: Taking Advantage of Stoichiometric Reactions.
07. Principles of Neutralization Titrations: Determining Acids, Bases, and the pH of Buffer Solutions.
08. Titrating Polyfunctional Acids and Bases.
09. Applying Neutralization Titrations.
10. Complexation and Precipitation Titrations: Taking Advantage of Complexing and Precipitating Agents.

Final Test

Remarks 備註	

Courses taught in English

Course title 課程名稱	Analytical Chemistry (分析化學)
Course Description 課程概述	The contents contains basic conpcents of the classical chemical analysis.It include qualitative and quantitative analysis, errors, simple statitics, chemical equilibrium, gravimetric, volumetric methods. The preciptation, titration methods are introduced.
Course objective 課程目標	The objetive of this course is to give basic concepts of analytical chemistry to the studients.
Competence 核心能力	Concepts in chemical analysis. Titration methods. Data satistics, Preciptation, Chemical equilibrium calculations.
Prerequisite Course(s) 先修課程或先備能力	Genernal chemistry
Teaching Strategies 教學方法	Powpoint slides, oral presentation
Course Material 課程教材	Text Book: Introduction to Analytical Chemistry, Douglas A Skoog, et al. 2011, 1st ed.
Grading 評量方式	30% Daily, 30% Mid.Test, 40% Final Test
References 參考書目	NA
Contact with Teacher 老師聯絡資訊	05-6315495 紅樓二樓 Teacher Office

Course Outline
課程進度

Analytical Chemistry 英語課程大綱:

01. What is Analytical Chemistry?
02. Important Chemical Concepts and a Basic Approach to Chemical Equilibrium.
03. Errors, Random Errors, and Statistical Data in Chemical Analyses.
04. Gravimetric Methods of Analysis.
05. Electrolyte Effects and Equilibrium: Calculations in Complex Systems.

Mid. Test.

06. Titrations: Taking Advantage of Stoichiometric Reactions.
07. Principles of Neutralization Titrations: Determining Acids, Bases, and the pH of Buffer Solutions.
08. Titrating Polyfunctional Acids and Bases.
09. Applying Neutralization Titrations.
10. Complexation and Precipitation Titrations: Taking Advantage of Complexing and Precipitating Agents.

Final Test

Remarks 備註	

Courses taught in English

Course title 課程名稱	Biostatistics （生物統計學）
Course Description 課程概述	The course is divided into three parts. The first part introduces sampling method and presentation of data. The next part focus on descriptive statistics and probability. Finally, the course distinguishes between populations and samples and begin to introduce the variation of data, thus progressing to inference.
Course objective 課程目標	Principles of Biostatistics is aimed at students in the biological and health sciences who wish to learn research methods and application.
Competence 核心能力	Professional and cross-cutting capacity with capability of using biostatistics in making multi-discipline analysis of biotechnology and studies.
Prerequisite Course(s) 先修課程或先備能力	Mathematics
Teaching Strategies 教學方法	Lecturing English as a medium of instruction
Course Material 課程教材	Pagano, M., & Gauvreau, K. (2018). Principles of biostatistics. 2nd Edition, CRC Press. ISBN 9781138593145.
Grading 評量方式	1.Homework 40% 2.midterm exam 30% 3.Term exam 30%
References 參考書目	
Contact with Teacher 老師聯絡資訊	Email: chlai@nfu.edu.tw

Course Outline 課程進度	
1. Introduction of biostatistics 2. Sampling theory 3. Survival data and data presentation	

4. Descriptive statistics 5. Probability distributions 6. Estimation and hypothesis testing 7. Comparison of two means 8. Analysis of variance (ANOVA) 9. Chi-squared distribution 10. Correlation and regression analysis	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Biostatistics (生物統計學)
Course Description 課程概述	The course is divided into three parts. The first part introduces sampling method and presentation of data. The next part focus on descriptive statistics and probability. Finally, the course distinguishes between populations and samples and begin to introduce the variation of data, thus progressing to inference.
Course objective 課程目標	Principles of Biostatistics is aimed at students in the biological and health sciences who wish to learn research methods and application.
Competence 核心能力	Professional and cross-cutting capacity with capability of using biostatistics in making multi-discipline analysis of biotechnology and studies.
Prerequisite Course(s) 先修課程或先備能力	Mathematics
Teaching Strategies 教學方法	Lecturing English as a medium of instruction
Course Material 課程教材	Pagano, M., & Gauvreau, K. (2018). Principles of biostatistics. 2nd Edition, CRC Press. ISBN 9781138593145.
Grading 評量方式	1.Homework 40% 2.midterm exam 30% 3.Term exam 30%
References 參考書目	
Contact with Teacher 老師聯絡資訊	Email: chlai@nfu.edu.tw

Course Outline 課程進度	
11. Introduction of biostatistics 12. Sampling theory 13. Survival data and data presentation 14. Descriptive statistics 15. Probability distributions 16. Estimation and hypothesis testing 17. Comparison of two means 18. Analysis of variance (ANOVA) 19. Chi-squared distribution 20. Correlation and regression analysis	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Food Microbiology (食品微生物學與實習)
Course Description 課程概述	This course aims to introduce the microorganisms in various foods, and explain the problems of food poisoning in terms of the existence and living conditions of microorganisms in food, the types of microorganisms in different food categories, the living conditions and their effects, and the adverse consequences of food caused by various microorganisms. Maintain the established quality of food, control measures and standards in microbiology, detailed discussion of several important and common fermentation products of microbes in food manufacturing, and common analysis methods of microbes.
Course objective 課程目標	Cultivate students' practical application skills such as the knowledge of using microorganisms and the prevention of disease-causing microorganisms when engaged in food-related fields.
Competence 核心能力	Food microbiological knowledge and experimental practices.
Prerequisite Course(s) 先修課程或先備能力	Microbiological background

Teaching Strategies 教學方法	Lecture and experimental practices.
Course Material 課程教材	Textbook, powerpoint.
Grading 評量方式	Middle exam Final exam
References 參考書目	Ray, B., Bhunia, A.Fundamental Food Microbiology. CRC Press, Taylor & Francis Group.
Contact with Teacher 老師聯絡資訊	Chung Yi Wang cywang@nfu.edu.tw 05-6313479

Course Outline
課程進度

Week 1 Introduction
Week 2 Microbial growth response in the food environment
Week 3 Factors influencing microbial growth in foods
Week 4 Microorganisms used in food fermentation
Week 5 Microbial food spoilage
Week 6 Microbial food diseases
Week 7 Control of microorganism in foods
Week 8 Microbial detection
Week 9 Midterm exam
Week 10 Hazard analysis critical control points (HACCP)
Week 11 Experiment grouping, introduction, and medium preparation
Week 12 Experiment 1: Total bacterial count
Week 13 Experiment 2: E. coli count
Week 14 Experiment 3: beer brewing
Week 15 Experiment 4: coco bean fermentation
Week 16 Experiment 5: Spectrophotometer detection method
Week 17 Experiment 6: API: bacterial identification
Week 18 Final exam

Remarks 備註	

Course title 課程名稱	Principle and Technology of Molecular Biology (分生技術與原理)
Course Description 課程概述	This course covers the basic principles of molecular biology and technology, in both prokaryotic and eukaryotic cells. Course involve the theories and methods that drive the fields of biology, biotechnology and medicine, comprehensively covering both the techniques students will encounter in lab classes and those that underpin current key advances and discoveries. The contents have been updated to include both traditional and cutting-edge techniques most commonly used in current life science research. Emphasis is placed on understanding the theory behind the techniques, as well as analysis of the resulting data. New chapters cover proteomics, genomics, metabolomics, and bioinformatics, as well as data analysis and visualization.
Course objective 課程目標	Our goal was to train students to acquire, understand, and communicate new scientific knowledge in the field. The main feature of our new teaching methodology was progressive training in scientific practices associated with a back-and-forward interplay between activities and assessments
Competence 核心能力	1. Introduce the student into the world of Molecular Biology, to understand the transfer of genetic information from nucleic acid till protein synthesis and cell function. 2. Help the student to know the general structure, organization and function of eukaryotic cells. We aim to transmit the student how morphology, structure and function are connected. 3. Teach to student the bases of basic research in molecular and cellular biology, and help them reaching the correct conclusions from their experimental results.
Prerequisite Course(s) 先修課程或先備能力	Molecular Biology:
Teaching Strategies 教學方法	1. Giving students opportunities to think and talk about molecular biology 2. Encouraging, demanding, and actively managing the participation of all student 3. Monitoring behavior to cultivate divergent molecular biological thinking
Course Material 課程教材	Gene Cloning ; By (author) Julia Lodge , By (author) Peter Lund , By (author) Steve Minchin
Grading 評量方式	Usual performance：30％ Midterm exam：30％ Final Exam：40％
References 參考書目	Molecular Biotechnology: Principles and Applications of Recombinant DNA , 5th Edition
Contact with Teacher 老師聯絡資訊	Chi-Chung Pen 05-6315505

Course Outline 課程進度	
1. Gene cloning technology 2. Protein purification technology 3. Gene editing (CRISPR Capse 9) 4. Real time PCR 5. Molecular diagnostics (a. gene chip, GeXP, SNP, Sequenom Mass ARRAY System, antibody) Midterm exam	6. Antibody Drug 7. Gene Therapy 8. Phage display 9. ImmunoTherapy Final Exam
Remarks 備註	