109/2 Courses taught in English(109 學年度第 2 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	2430	Theory of gearing 齒輪原理	Elective 選修	3	Shinn-Liang Chang 張信良					5-7	(BGB0709) Second Assembly Building 7th floor classroom 綜合工程二館 7F BGB0709 小型教室	Course Outline
2	Department of power mechanical engineering 動力機械工程系	2428	Practical mechanism innovation Design 機構創新設計實務	lective 選修	3	Long-Chang Hsieh 謝龍昌		5-7				(BGB0514)Second Assembly Building 5th floor creation Classroom. 綜合工程二館 5F BGB0514 創意教室	Course Outline
3	Department of power mechanical engineering 動力機械工程系	2427	Advanced enginnring Analysis 高等工程分析	Elective 選修	3	Shou-Yin Yang 楊授印	2-4					(BGB0709) Second Assembly Building 7th floor classroom 綜合工程二館 7F BGB0709 小型教室	Course Outline

4	Department of power mechanical engineering 動力機械工程系	2432	Dynamics of machine System 機器系統動力學	Elective 選修	3	Hwang, Yunn-Lin 黃運琳				2-4		(BGA0760)rst 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
5	Department of power mechanical engineering 動力機械工程系	2433	Advanced in nano/micro tribology 高等微奈米磨潤	Elective 選修	3	Jeng-Haur Horng 洪政豪	7-9					(BGB0709) Second Assembly Building 7th floor classroom 綜合工程二館 7F BGB0709 小型教室	Course Outline
6	Department of Automation Engineering 自動化工程系	0056	Big Data Analysis 巨量資料分析	Elective 選修	3	Kuang-Chyi Lee 李廣齊		8-10				資訊大樓 2F AI A0201 普通教室	Course Outline
7	Department of Automation Engineering 自動化工程系	0054	Engineering Analysis 工程分析	Elective 選修	3	Meng-Tse Lee 李孟澤		2-4				綜合工程一館 3F BGA0340 研討室	Course Outline
8	Department of Automation Engineering 自動化工程系	0051	Creation and Innovation 創意與發明	Elective 選修	3	Roug-Feng Tsai 蔡榮鋒	5-7					綜合工程一館 4F 專業講堂	Course Outline

9	Graduate Institute of Aeronautical and Electronic Technology(飛機工程系航空與電子科技碩士班)	0302	Flight Safety 飛航安全	Elective 選修	3	Wang, Shih-Chia 王士嘉				10-12		Aircraft Hydraulic System Lab. The 3rd Complex Building 7F (BGC0704) 綜合工程三館 7F BGC0704 飛機液氣壓實習工場	Course Outline
10	Graduate Institute of Aeronautical and Electronic Technology(飛機工程系航空與電子科技碩士班)	0301	Aircraft Stability and Control 飛機穩定性與控制	Elective 選修	3	Lu, Wen-Chi 呂文祺			2-4			(ATB0504) 第二期教學大樓 5F ATB0504 普通教室	Course Outline
11	Graduate Institute of Aeronautical and Electronic Technology(飛機工程系航空與電子科技碩士班)	0310	International Aviation Regulation 國際民航法規	Elective 選修	3	Lin, Chung-Yan 林中彥				2-4		The 3rd Complex Building 2F (BGC0205) 綜合工程三館 2F BGC0205 專業教室	Course Outline
12	Graduate Institute of Aeronautical and Electronic Technology(飛	0312	Deep Learning 深度學習	Elective 選修	3	Chao-Yang Lee 李朝陽	5-7					Aircraft Hydraulic System Lab. The 3rd Complex Building 7F (BGC0704) 綜合工程三館 7F	Course Outline

	機工程系航空與電子科技碩士班)											BGC0704 飛機液氣壓實習工場	
13	Department of Mechanical Design Engineering(機械設計工程系碩士班)	0242	Mechanical Vibrations 機械振動學	Elective 選修	3	Hwang, Yunn-Lin 黃運琳			2-4			(BGA0760) Multi-Purpose Engineering Bldg., Reverse and Rapid Protoyping Lab.7F 綜合工程一館 7F BGA0760 逆向快速成型實驗室	Course Outline
14	Department of Electrical Engineering（電機工程系）	0142	Advance SOC FPGA System Integration with Machine Learning 高等 FPGA 系統設計與實務	Elective 選修	3	SUN, CHI-CHIA 宋啟嘉	5-7					BEE0502; Network Application and Chip Design Lab. 5F, Electrical Engineering Building 電機館 5F BEE0502 網路應用與晶片設計實驗室	Course Outline
15	Department of Electrical Engineering（電機工程系）	0145	4G/5G Mobile Broadband Collaborative Network 4G/5G 行動寬頻協同網路	Elective 選修	3	SU, HUI-KAI 蘇暉凱				2-4		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

16	Department of Electrical Engineering（電機工程系）(大學部)	1013	Science and Technology English 科技英文	Elective 選修	3	Wu,Sen-Tung 吳森統	7		6,7			BEE0104;Electric Machinery Lab. 1F, Engineering Building 電機館 1F BEE0104 電機機械實驗室	Course Outline
17	Institute of Department of Finance(財務金融系碩士班)	0305	The Theory and Practice of Investment 投資學理論與實務	Required 必修	3	Lai , Ya-Wen 賴雅雯			2-4			(CMA0201) Seminar Room II, Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0201 財金研討室 II	Course Outline
18	Institute of Department of Finance(財務金融系碩士班)	0037	Financial Program Trading 財金程式交易	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 Department of Finance(財務金融系碩士班)	0038	Financial Econometrics Softwares 財金計量	Elective 選修	3	Wang, Jo-Yu 王若愚		5-7				(CMA0201) Seminar Room II, Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0201 財	Course Outline

												金研討室 II	
20	Institute of Industrial Engineering and Management（工業管理系工業工程與管理碩士班）	0323	Networks and Logistics 網路與運籌	Elective 選修	3	Hsieh , Yi-Chih 謝益智			6-8			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
21	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	Chih-Hsiung 胡智熊				5-7		Business Intelligence Room (CMA0305) Applied Arts, Sciences and Management Building 3F 文理暨管理大樓 3F CMA0305 企業智慧教室	Course Outline
22	Institute of Industrial Engineering and Management（工業管理系工業工程與管理碩士班）	0326	Production Management and Practice 生產管理與實務	Elective 選修	3	Lee, Ying-Lien 李英聯				2-4		Business Intelligence Room (CMA0305) Applied Arts, Sciences and Management Building 3F 文理暨管理大樓 3F CMA0305	Course Outline

												企業智慧教室	
23	Institute of Industrial Engineering and Management（工業管理系工業工程與管理碩士班）	0327	Applied Statistics 應用統計學	Elective 選修	3	Huang, Jyun-Ping 黃俊平	2-4					Business Intelligence Room (CMA0305) Applied Arts, Sciences and Management Building 3F 文理暨管理大樓 3F CMA0305 企業智慧教室	Course Outline
24	Institute of Business and management（經營管理碩士班）	0351	Technology Management 科技管理	Elective 選修	3	Yu-Chun Chen 陳鈺淳	5-7					(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
25	Institute of Business and management（經營管理碩士班）	0349	Behavioral Finance 行為財務	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	Course Outline

												CMA0209 創業管理實驗室	
26	Institute of Business and management（經營管理碩士班）	0350	Strategic Management 策略管理	Elective 選修	3	Yi Hsu 徐怡		5-7				(CMA0206) Market Survey Lab, 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
27	Institute of Business and management（經營管理碩士班）	0348	Information Management 資訊管理	Elective 選修	3	Liang, Chih-Chin 梁直青			2-4			(CMA0208) Applied Arts, Sciences and Management Building 2F 文理暨管理大樓 2F CMA0208 教室	Course Outline
28	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）	0178	Project Discussions (II) 專題討論(二)	Required 必修	0	Siu-Tsen, Shen 沈思岑				3-4		(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗室 CHB0305	Course Outline
29	Graduate Institute of Digital Contents and Creative Industries（多媒	0182	Multimedia Creativity and Performance Research 多媒體創作	Elective 選修	3	Siu-Tsen, Shen 沈思岑				5-7		(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓	Course Outline

	體設計系數位內容創意產業研究所碩士班）		與表現專題研究									多媒體設計實驗室 CHB0305	
30	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）	0188	Research on social media interaction Integrated 社交媒體互動研究	Elective 選修	3	Siu-Tsen, Shen 沈思岑		5-7				(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗室 CHB0305	Course Outline
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）	0181	Research of Interactive Technology and Applications 互動媒體與創新設計研究	Elective 選修	3	Wen-Hwa , Cheng 鄭文華		2-4				(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗室 CHB0305	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	Creative Industries in Cultural Research 文化創意產業研究	Elective 選修	3	Wu-Haw Jue 朱文浩			5-7			(CHB0305) Multimedia Design Studio, Art and Humanity Building 3F 人文大樓三樓 多媒體設計實驗室 CHB0305	Course Outline

33	Institute of Information Management(資訊管理系碩士班)	0095	Database Management 資料庫管理	Elective 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
34	Institute of Information Management(資訊管理系碩士班)	0099	Machine Learning and Big data 機器學習與大數據	Elective 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
35	Institute of Information Management(資訊管理系碩士班)	0111	Production and Operations Management 生產作業與管理	Elective 選修	3	Wen-Hung Kuo 郭文宏			2-4			(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
36	Institute of Information Management(資訊管理系碩士班)	0097	Web Technology Application and Integration Web 技術應用與整合	Elective 選修	3	Y-F Lan 藍友烽					2-4	(CMA0405) ., Applied Arts, Sciences and Management Building 4F 文理暨管理大樓 4F CMA0406 企業電子化電腦教室	Course Outline
37	Master of Electro-Optical and Materials Science(光電工程系光電與材料科技碩士班)	2464	Organic Electro-Optics Devices 有機光電元件	Elective 選修	3	Fuh-Shyang Juang 莊賦祥			5-7			(BGA0250) classroom1,First Assembly Building 2F 光電系 B1 預備教室 1	Course Outline

38	Graduate Institute of Materials Science and Green Energy Engineering（材料科學與工程系材料科學與綠色能源工程碩士班）	0227	Surface analysis 材料表面分析	Elective 選修	3	Chau-Yi Tsai 蔡朝伊				5-7		（AME0324）Mechanical Engineering Hall 3rd Floor Classroom(三) 機械工程館 3F AME0324 預備教室(三)	Course Outline

Courses taught in English

Course title 課程名稱	Theory of Gearing (齒輪原理)
Course Description 課程概述	Gears are popularly applied in industry. Engineers need the knowledge how to generate the tooth profile according to the manufacturing machines. The tooth contact analysis between the meshing gears is also studied in the class.
Course objective 課程目標	1. Coordinate Transformation 2. Tooth Profile Generation 3. Tooth Contact Analysis
Competence 核心能力	Learn to derive the tooth profile of gears based on the machine and cutter geometry.
Prerequisite Course(s) 先修課程或先備能力	Mechanisms
Teaching Strategies 教學方法	Class Learning and Project Based Learning
Course Material 課程教材	Theory of Gearing, F. L. Litvin
Grading 評量方式	1. Mid-examination 2. Paper Reading and Presentation 3. Project
References 參考書目	Gear Geometry and Applied Theory, F. L. Litvin and Alfonso Fuentes
Contact with Teacher 老師聯絡資訊	05-6315440

Course Outline 課程進度	
1. Coordinate Transformation 2. Transformation of Motion 3. Plane Curves 4. Conjugate Shapes	1. Plane Gearing Analysis 2. Basic Kinematic Relations of Plane Gearings and Their Application 3. Generation of Conjugate Shapes 4. Project Study

Remarks 備註	

Courses taught in English

Course title 課程名稱	Practical Mechanism Innovative Design (機構創新設計實務)
Course Description 課程概述	1. Introduction of mechanisms 2. Basic principles of mechanisms 3. Mobility of mechanisms 4. Creative design methodology 5. Learn how to innovate new mechanisms to avoid the relevant patent.
Course objective 課程目標	Teaching students to understand the basic principles of mechanisms, and further to learn how to innovate new mechanisms to avoid the relevant patent.
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	Creative design of mechanical devices (Hong-Sen Yan, Springer, 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 Design 1.2 Design Peocess 1.3 Creative Design **Chapter 2 Mechanical devices**	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Advanced Engineering Analysis (高等工程分析)
Course Description 課程概述	The teaching objectives of this course can be summarized into two: the first goal is to learn how to model an engineering system, that is, how to build an analytical model; the second goal is to understand the numerical solution obtained after Fluent/Comsol analysis.
Course objective 課程目標	Train graduate students to evaluate engineering problems encountered in numerical analysis and solve engineering problems numerically
Competence 核心能力	Train students to quickly and accurately solve engineering problems encountered in the future workplace
Prerequisite Course(s) 先修課程或先備能力	Mathmatics
Teaching Strategies 教學方法	Oral and group project
Course Material 課程教材	Oral and power point
Grading 評量方式	Mid-exam, final exam and homework
References 參考書目	Fleunt and Comsol Text Book
Contact with Teacher 老師聯絡資訊	PME, 5F. Engineering Building 2,

Course Outline 課程進度	
Introduction	1 week
Matrix Algebra	1 week
Trusses	1 week
Axial Members, Beams and Frames	1 week
One-dimensional Elements	1 week
Analysis of One-dimensional Problems	1 week
Two-dimensional Elements	1 week
More Fluent	1 week
Analysis of Two-dimensional solid	1 week
Mechanics Problems	1 week
Dynamic Problems	1 week

Analysis of Fluid Mechanics Problems Three-Dimensional Elements Design and Material Selection Design Optimization	1 week 1 week 1 week 2 week 2 week
Remarks 備註	

Courses taught in English

Course title 課程名稱	Dynamics of Machine System (機器系統動力學)
Course Description 課程概述	Dynamics of Machine System (Cr./ Hrs.: 3/3) "Dynamics of Machine System" is the study of dynamic behavior of Machine System may undergo large translational and rotational displacements, velocities, accelerations and forces/torques.
Course objective 課程目標	Let students understand "Dynamics of Machine System" 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	Hamilton H. Mabie, Charles F. Reinholtz, 1987, Mechanisms and Dynamics of Machinery, 4th Edition, ISBN: 978-0-471-80237-2, 656 Pages.
Grading 評量方式	Homeworks, Mid-term Examination, Final Examination and Final Project.
References 參考書目	1. Shabana, Ahmed A., 2005, Dynamics of Multibody Systems, Cambridge University Press. 2. Oleg Vinogradov, 2000, Fundamentals of Kinematics and Dynamics of Machines and Mechanisms, CRC Press.
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. Linkage and Mechanism 3. Kinematics of Machine System 4. Dynamic of Machine System 5. Velocity and Acceleration Analysis	6. Constrained dynamics 7. Force Analysis 8. Other topics in spatial dynamics
Remarks 備註	

Courses taught in English

Course title 課程名稱	Advanced in Nano/Micro Tribology (高等微奈米磨潤)
Course Description 課程概述	This course focuses on learning the expertise of adhesion; microfriction and microwear for understanding the phenomena of macro components in friction and wear so that as the goal of improving component performance.
Course objective 課程目標	Objective for educating students to know the application of microscopic friction, wear, lubrication and with learning the correlation between Macro-Tribology and Micro/Nano-Tribology.
Competence 核心能力	1. Develop students' inter-disciplinary knowledge in Mechanical and Electro- Mechanical (Microtribology Engineering). 2. Develop students' capabilities in writing academic articles. 3. Develop students' capabilities in innovative thinking and problem-analysis with structural and systematic. 4. Develop students' capabilities in data application, international trend of mechanical technology comprehension, research and innovation.
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	Teaching materials: Self-made Teaching methods: Teaching in the classroom and laboratory Teaching resources: Laboratory equipment in teaching and learning
Course Material 課程教材	Self-made teaching materials
Grading 評量方式	Quiz, Mid-term exam, Final exam
References 參考書目	Introduction to Tribology (Writer: Bharat Bhushan ; ISBN: 0471158933)
Contact with Teacher 老師聯絡資訊	05-6315428 jhhorng@gmail.com

Course Outline 課程進度	
CHAPTER 1 ADHESION 1.1 Introduction 1.1.1 What is adhesive force? 1.1.2 What is the adhesive? 1.2 Solid-solid contact 1.3 Liquid-mediated contact CHAPTER 2 SURFACE FILM 2.1 Soft film 2.2 Hard film CHAPTER 3 CONTACT ANALYSIS 3.1 Surface roughness 3.2 Microcontact model 3.3 Adhesion model 3.4 Application of microcontact CHAPTER 4 MICRO/NANOTRIBOLOGY 4.1 Micro-friction 4.2 Micro-wear 4.3 Static dynamic, and shear properties of molecularly thin liquid film 4.4 Smooth sliding and stick-slip	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Big Data Analysis (巨量資料分析)
Course Description 課程概述	The course completely self-contained and heavily illustrated this introduction to basic concepts and methodologies for data mining and big data analytics truly is suitable for seniors and first-year graduate students in almost any technical discipline. The course explores the concepts and techniques of data mining, a promising and flourishing frontier in data and information systems and their applications. Data mining, also popularly referred to as knowledge discovery from data (KDD), is the automated or convenient extraction of patterns representing knowledge implicitly stored or captured in large databases, data warehouses, the Web, other massive information repositories, or data streams.

Course objective 課程目標	Introducing the concepts of data mining and big data analysis.
Competence 核心能力	Progamming about the data mining and big data analysis.
Prerequisite Course(s) 先修課程或先備能力	Computer Programming Languages (計算機程式)
Teaching Strategies 教學方法	Oral Teaching, Practice in computer and Testing
Course Material 課程教材	Jiawei Han & Micheline Kamber, Data Mining: Concepts and Techniques, 2nd edition, Elsevier: Morgan Kaufmann Publishers.
Grading 評量方式	◆attendance rate：10 % ◆The usual assessment：30 % ◆Midterm assessment：25 % ◆Final assessment：25 %　◆The others：10%
References 參考書目	Hand-Out and Web-site Materials
Contact with Teacher 老師聯絡資訊	Kuang-Chyi Lee, kclee@nfu.edu.tw, 05-6315379

Course Outline 課程進度	
Introduction to Data Mining and Knowledge Discovery from Data Data Preprocessing Binary image Data Warehouse and Technology Data Cube Computation and Data Generalization Mining Frequent Patterns, Associations and Correlations	Classification Prediction Accuracy and Error Measures Cluster Analysis Mining Stream Time-Series Sequence Data
Remarks 備註	

Courses taught in English

Course title 課程名稱	Engineering Analysis (工程分析)
Course Description 課程概述	If an engineer asked to solve an engineering problem (usually a physical nature), they first have to formulate the problem as a mathematical expression in terms of variable, functions, equations…and so on. Such an expression is known as a “mathematical model” to the given problem.
Course objective 課程目標	In this course, engineering analysis, it is a training to establish the connection between “real physic phenomenon” and its “mathematical model” in order to solve (and to analyze) engineering problems. It requires all four phases: 1.Obsvering- Observe the target’s behavior and make assumptions

	2. Modeling- The transition from physical situation to its mathematical formulations 3. Solving- The solution by a mathematical method (skill) 4. Examination- The physical interpretation of the result
Competence 核心能力	Transfer a engineering problem into mathematical model then solve it
Prerequisite Course(s) 先修課程或先備能力	Physics, Calculus, Engineering Mathematics
Teaching Strategies 教學方法	In-class notes and Case studies
Course Material 課程教材	Tailor-made teaching materials
Grading 評量方式	In-class Exams 15%*2, Mid-term Exam 30%, Final Exam 30%, Roll call 10%
References 參考書目	Advanced Engineering Mathematics, 10th edition, Erwin Kreyszig, Wiley
Contact with Teacher 老師聯絡資訊	mtlee@nfu.edu.tw, 05-6315388

Course Outline 課程進度	
Part-1: The Introduction to “Modeling” Part-2: 1st Order ODE Models Part-3: 2nd Order Homogeneous ODE Part-4: 2nd Order Homogeneous ODE Models – Free Oscillations	Part-5: Non-homogeneous ODE Part-6: Non-homogeneous ODE Models – Forced Oscillations Part-7: Linear System of ODE Part-8: Linear System of ODE Models – Multi-Systems Interaction

Remarks 備註	

Courses taught in English

Course title 課程名稱	Creation and Innovation (創意與發明)
Course Description 課程概述	The course allows flexible options in different aspects of innovation and recreation.Three ~ five student may organize a group and focuses a subject to present the history, development, future application on ECO, energy saving, 3D printing, and engineering, commercial & practical application in present and future life.The course starts from important existing inventions to discover the research background, theory, difficulty in marketing etc.The theories of TRIZ will be mentioned to summarize the invention principles.
Course objective 課程目標	to describe the properties of existing problems to discover the disadvantage of existing product or problems to summarize existing solutions to organize a group to discuss the problems in different aspects to think with TRIZ theoreyI to integrate the possible suggestions
Competence 核心能力	■Problem describition ■Communication in and between the groups。 ■Group coordination 。 ■Innovation thinking of existing technique or products (TRIZ)
Prerequisite Course(s) 先修課程或先備能力	NONE
Teaching Strategies 教學方法	The course concentrates on the team project in observation, information collection, reports, and Q&A, especially on discussion and suggestions.
Course Material 課程教材	Purposely prepared
Grading 評量方式	1.Group project 2.Presentation 3.Discussion 4.Feed Back
References 參考書目	NONE
Contact with Teacher 老師聯絡資訊	X5385 Room 1593

Course Outline 課程進度	
Chapter 1 : Introduction Chapter 2 : Case studies i: bicycle, instant noodle, Walkman, MP3 Chapter 3 : Case studies ii: airplane, submarine	Chapter 10 : Iot and its application I Chapter 11 : Iot and its application II Chapter 12 : Iot and its application III Chapter 13 Final report and discussion I

Chapter 4 : Case studies iii: Development of car and its accessories Chapter 5 : Case studies iv: Air conditioner and refrigerator Chapter 6 : Discussion I Chapter 7 : TRIZ I: daily living tool Chapter 8: TRIZ II: stationary Chapter 9 : Discussion II	Chapter 14 Final report and discussion II Chapter 15 Final report and discussion III Chapter 16Final report and discussion IV Chapter 17 Summary and Feedback I Chapter 18 Summary and Feedback II
Remarks 備註	

Courses taught in English

Course title 課程名稱	Introduction of Aviation Safety (飛航安全)
Course Description 課程概述	Air transport will continue to grow. It has a good relative safety record but public perception focuses on total accidents rather than relative safety. This has led to the setting of ambitious new safety targets for air transport, whose attainment will require improved knowledge of causes of accidents and better understanding of the effects of new technologies and procedures. Human factors and operational environments are key elements while aircraft design, construction and maintenance, together with operations and accident mitigation, also play important roles. During the lectures a variety of projects relating to these matters were presented.
Course objective 課程目標	Understand and implement the process of accident investigation and • This course covers all aspects of investigation from applicable rules and regulations through investigation technology, analysis and reports. • The participant develops an understanding of the entire investigation process and is well prepared to participate in future investigations.
Competence 核心能力	The abilities and skills a student should learn in accident investigation of all aspects of industries – but they are beneficial to apply, and sometimes originate, in the workplace.
Prerequisite Course(s) 先修課程或先備能力	This course is for individuals who may wish becoming involved in future accident investigations in any capacity and need to understand basic investigation technology.
Teaching Strategies 教學方法	Oral Lecture, Case Method and Panel Discussion

Course Material 課程教材	Aircraft Accident Investigation, April 24, 2006by Richard Wood (Author), Robert Sweginnis (Author)
Grading 評量方式	Case study presentation and group report writing
References 參考書目	Lecturer's hand out.
Contact with Teacher 老師聯絡資訊	Arnold Wang, Phone (O)05-631-5538, E-mail: arnold@nfu.edu.tw

Course Outline 課程進度	
1. Introduction of aircraft accident investigation 2. The Civil Investigation Process 3. International Investigation Procedures (ICAO) 4. Preparing for Investigation 5. Safety at the Crash Site 6. Priorities and Initial Actions 7. Investigation Techniques for: Engines, Structures, Fire, Aircraft Systems, Instruments, and Recording Devices 8. Wreckage Recovery and Reconstruction	9. Interviewing Witnesses 10. Behavior of Materials 11. Using the Global Positioning Satellite (GPS) System 12. Aircraft Performance Factors 13. Computers and Simulation 14. Human Factors and Accident Pathology 15. Analytical Techniques 16. Reporting Requirements 17. Construction of Reports 18. Investigation Management.

Remarks 備註	

Courses taught in English

Course title 課程名稱	Aircraft Stability and Control (飛機穩定性與控制)
Course Description 課程概述	This course gives a preliminary knowledge for further investigation in flight dynamic analysis and control law design of fixed-wing aircraft. The material covers the basic knowledge of aerodynamics, aircraft dynamics and generic flight control design issues. Flight mechanics is the major topics in this course.
Course objective 課程目標	1. Familiar with aircraft dynamics with configurations 2. Understanding flight dynamics in equations

	3. Analyzing aircraft dynamics with software tools
Competence 核心能力	The abilities and skills should be learned in this course are to apply physics and mathematics to understand the dynamics of aircraft, and evaluate their stability with classical control theory.
Prerequisite Course(s) 先修課程或先備能力	1. Dynamics 2. Advanced mathematics 3. Classic control theory
Teaching Strategies 教學方法	Oral Lecture, Case Method and Panel Discussion
Course Material 課程教材	Flight Stability and Automatic Control, 2nd Ed., Robert C. Nelson, McGraw-Hill, ISBN 978-0070462731. 1992.
Grading 評量方式	Home assignments, mid-term report and final report and oral presentation.
References 參考書目	Lecturer's hand out.
Contact with Teacher 老師聯絡資訊	Wen-Chi Lu Phone (O)05-631-5545, E-mail: luwenchi@nfu.edu.tw
Course Outline 課程進度	
1. Introduction to aircraft dynamics and stability (1 week) 2. The Atmosphere and Aerodynamics (1 weeks) 3. Static Stability and Control (3 weeks) 4. Mid-term report (1 week) 5. Rigid Equations of Motion and Stability Derivatives (3 weeks) 6. Flying Qualities (1 week) 7. Stability Augmentation (1 week) 8. Autopilot Design (1 week) 9. Final Report (1 week)	
Remarks 備註	

Courses taught in English

Course title 課程名稱	International Aviation Regulation (國際民航法規)
Course Description 課程概述	In the class, we will focus on aviation regulations; 1. Basic concepts of regulation 2. Civil Aviation Regulation System 3. Air rights and air traffic 4. FAR/EASA/International Civil Aviation Organization's historical origins and evolution 5. Evolution and current status of unmanned aircraft related regulations 6. Airport development and related regulations
Course objective 課程目標	Understand the regulation system and their development history in EASA/FAA and Taiwan
Competence 核心能力	Understand the regulation system and their development history in EASA/FAA and Taiwan
Prerequisite Course(s) 先修課程或先備能力	none
Teaching Strategies 教學方法	Class Lecture and Student Project Presentation
Course Material 課程教材	Provided by Instructor
Grading 評量方式	Mid-Term Exam and Student Project Presentation
References 參考書目	民航法規 楊政樺 著 揚智出版社
Contact with Teacher 老師聯絡資訊	**Instructor:** C Y Lin **Office Hours:** by appointment or any time I'm in the office & available **Contact** me @ Frank.Lin@nfu.edu.tw

Course Outline 課程進度	
Basic Concepts of Regulation Civil Aviation Regulation System Air Navigation and Airline The origin and historical evolution of FAR/EASA	Evolution and current status of unmanned aerial vehicle regulations Airport Development and Related Regulations FAR91/135 regulations

Remarks 備註	

Courses taught in English

Course title 課程名稱	Deep Learning (深度學習)
Course Description 課程概述	This course will establish students' basic concepts of deep learning. In addition, this course will introduce the applications of deep learning, through which students can understand deep learning more easily. Through the implementation of the project, students learn how to apply deep learning to solve problems. This course introduces the concepts of deep learning and the applications of deep learning. Moreover, the project implementation allows students to learn how to apply deep learning to solve problems.
Course objective 課程目標	Enable students to understand the theories and methods of deep learning Provide students with the ability to design deep learning Enable students to apply deep learning to solve problems
Competence 核心能力	AI
Prerequisite Course(s) 先修課程或先備能力	Programing
Teaching Strategies 教學方法	Learn by doing
Course Material 課程教材	
Grading 評量方式	Paper Presentation 20% Project Plan 20% Report Presentation 60%
References 參考書目	
Contact with Teacher 老師聯絡資訊	chaoyang@nfu.edu.tw

Course Outline 課程進度	
1. Course Introduction 2. Introduction to Deep learning 3. Deep feedforward network, convolutional network 4. Convolutional Neural Network 5. Recurrent neural network, combining CNN and LSTM 6. Self-Driving Drones, Deep learning for autonomous Driving Drones	

7. Analytics for autonomous driving with ROS 8. Challenges of Deep learning in the automotive Industry and Autonomous Driving 9. Deep learning basics Introduction and overviews with Tensorflow 10. End-to-End Machine learning stacks 11. Generalizable Autonomy in Robotics 12. Deep Reinforcements learning 13. Paper Presentation 14. Paper Presentation 15. Student project plan 16. Student project plan 17. Student report demo 18. Student report demo	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Mechanical Vibrations (機械振動學)
Course Description 課程概述	Mechanical Vibrations is the study of the vibration behavior of flexible bodies, each of which may undergo external exciting forces.
Course objective 課程目標	Let students understand “Mechanical Vibrations” in 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 A. A., 1991, *Theory of Vibration - Volume I: An Introduction*, Springer-Verlag, New York.
Grading 評量方式	Quiz, Mid-term Examination, Final Examination, and Final Project.
References 參考書目	1. Meirovitch L., 1987, Element of Vibration Analysis, 2nd edition, McGraw-Hill Book Company, New York. 2. Inman D. J., 1994, Engineering Vibration, Prentice-Hall International, New York.

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

Remarks 備註	

Courses taught in English

Course title 課程名稱	Advance SOC FPGA System Integration with Machine Learning (高等 FPGA 系統設計與實務)
Course Description 課程概述	This course is designed for graduate students who are interested in advanced SoC FPGA design concepts, design methodology, and basic concept of Machine Learning. In the meantime, several Labs about the Xilinx PYNQ tutorials related to AI and Machine Learning will be demonstrated. After that, several lectures with the related topics to OpenCL FPGA tutorials 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 or PYNQ FPGA.
Course objective 課程目標	The objective of Advance SOC FPGA System Integration with Machine Learning is a guidance how 21's century SOC FPGA 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)	HDL Language (VHDL or Verilog) CPLD/FPGA Implantation

先修課程或先備能力	
Teaching Strategies 教學方法	Lectures and Labs
Course Material 課程教材	● Power Point Slides ● FPGA labs ● PYNQ Labs ● Machine Learning 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	● Kastner R., Matai J. and Neuendorffer S. “Parallel Programming for FPGAs”, Kastner Research Group 2018 ● The Zynq Book, http://www.zynqbook.com/ 2018. ● S. Palnitkar, “Verilog HDL: A Guide to Digital Design and ● Synthesis”, Prentice Hall, 2003, Second Edition
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 SoC FPGA 2. Introduction of Machine Learning 3. Xilinx PYNQ Labs 4. Colloquium and Mid-Report 5. OpenCL@SDSOC 6. Colloquium 7. Final-Project and Presentation	

Remarks 備註	

Courses taught in English

Course title 課程名稱	4G/5G Mobile Broadband Collaborative Network
Course Description 課程概述	This course is designed for graduate students who are interested in 4G and 5G mobile broadband networks. The students will know the fundamental of 4G/5G mobile network and network collaborative access technology. Moreover, several labs about 5G-like technologies by using SDR (Software Defined Radio) are included in this course, such as small base station establishment, mobile collaborative network, etc. The students will obtain the skills of 4G/5G mobile network implementation and measurement analysis. Finally, the students will discuss and present their final projects.

Course objective 課程目標	1. Let students to have the fundamental of 4G/5G mobile network and network collaborative access technology. 2. Train students to have the skills of 4G/5G mobile network implementation and measurement analysis.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	
Teaching Strategies 教學方法	Lectures and Labs
Course Material 課程教材	The course materials of the Ministry of Education - 4G/5G mobile broadband collaborative network.
Grading 評量方式	1. Attendance: 10% 2. Lab reports: 40% 3. Mid-term exam: 20% 4. Final project: 30%
References 參考書目	
Contact with Teacher 老師聯絡資訊	+886-5-6315619 hksu@nfu.edu.tw Prof. Hui-Kai Su

Course Outline 課程進度	
1. Introduction to 5G Mobile Network 2. LTE-A System Architecture 3. 5G System Architecture: NSA and SA 4. Dual Connectivity (DC) Technology 5. Service-Based Architecture (SBA) Technology 6. Network Cooperative Access Technology 7. Open-Source Mobile Communication and 5G Simulation Platform 8. Final Project and Report	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Science and Technology English (科技英文)
Course Description 課程概述	The main idea of this course is to help students for oral presentation about engineering topics, especially for EE background. Besides, the practices of interview with foreign companies, conference call meetings, self-introduction, and skills of cooperate with foreigners are covered.
Course objective 課程目標	1. Students can have a short talk for engineering topics in English freely. 2. Students can communicate with exchanged students in English easily. 3. Student can hold and join a group meeting in English.

Competence 核心能力	Speaking and listening abilities are expected
Prerequisite Course(s) 先修課程或先備能力	1. Basic English grammar and vocabulary are required. 2. “Speaking without fear” is the key factor and basic criterion for the lesson.
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. Journal papers from website 2. ICRT radio station 3. Textbook
Grading 評量方式	1. 60% Participation, personal speaking practice, and group involving level 2. 20% Assignments 3. 20% Final Projects
References 參考書目	英語簡報演說技巧 English Public Speaking and Presentation ISBN：9789575324834
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.Reading skills for international science journals
2.Browsing skills for international science websites
3.Simulations of poster for international conferences
4.Freestyle oral speaking practice
5.Native/Non-native speakers’ listening practices
6.Simulation of industrial group meeting with speaking and listening skills
7.Simulation of industrial conference calls with speaking and listening skills
8.Self introduction
9.Interview skills for applying jobs in foreign industries
10.Connection with foreign exchanged students. Information delivering with speaking and drawing.
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 humble for other’s corrections in class. Also, they have to speak without any fears.

The course is suitable for students with engineering back ground only (this course is also suitable for graduated students).

Remarks 備註	

Course title 課程名稱	The Theory and Practice of Investment (投資學理論與實務)
Course Description 課程概述	This course is a graduate-level investment course that focuses on practical applications as well as analytical analyses of investment theories. The major topics include portfolio theory, factor pricing models and investment evaluation.
Course objective 課程目標	Students will understand how to build a well-diversified investment portfolio, how to select securities among each asset classes, and how to evaluate the portfolio performance.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	A basic understanding on statistics will be helpful but is not required
Teaching Strategies 教學方法	
Course Material 課程教材	Zvi Bodie, Alex Kane, and Alan J. Marcus (2013), Essentials of Investments, ninth Edition, McGraw-Hill.
Grading 評量方式	Mid-term Exam. 35% Final Exam. 35% Homework and Presentation 15% Regular attendance 15%
References 參考書目	
Contact with Teacher 老師聯絡資訊	Email: yawenlai@nfu.edu.tw

Course Outline 課程進度	
Course Introduction Portfolio Theory: Risk and Return Portfolio Theory: Diversification Portfolio Theory: CAPM and APT Portfolio Theory: EMH Portfolio Theory: Behavior Finance Equity Valuation Portfolio performance evaluation	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Financial Program Trading (財金程式交易)
Course Description 課程概述	This course introduces accessing financial data, machine learning techniques and algorithms that can be used to build and train algorithmic models. Students will be able to adopt algorithmic trading to implement smart investing strategies.
Course objective 課程目標	The objective of this course is to apply available and diverse data in algorithmic trading strategies. Through backtesting these developed strategies, students will apply them to virtual trading.
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, quiz, assignments, homework, projects, exams
Course Material 課程教材	Handouts, some online material
Grading 評量方式	Mid-term exam 30%, Final exam & projects 40%, participation, quiz, assignments 30%
References 參考書目	Python for Algorithmic Trading
Contact with Teacher 老師聯絡資訊	ftsai@nfu.edu.tw

Course Outline 課程進度	
	● Set up a proper Python environment for algorithmic trading ● Learn how to retrieve financial data from public and proprietary data sources ● Explore vectorization for financial analytics with NumPy and pandas ● Master vectorized backtesting of different algorithmic trading strategies ● Generate market predictions by using machine learning and deep learning ● Tackle real-time processing of streaming data with socket programming tools ● Implement automated algorithmic trading strategies

Remarks 備註	

Courses taught in English

Course title 課程名稱	Financial econometrics (財金計量)
Course Description 課程概述	Financial Econometrics is a one-semester course taught to the first year students of the NFU Master programme in financial managemen. Particularly, this course is designed to international students who'd like to study the essential knowledge and tools for working with financial data, including the return forecasting, volatility and econometrics of asset pricing, such as testing the market models. This course focuses on the empirical techniques which are mostly used in the analysis of financial markets and how they are applied to actual data. The course starts with the overview of financial data. It covers the event-study methodology, and continues with testing market models and factor models. We then proceed to analyze return predictability, volatility effects of the market data (asymmetric GARCH), and market interdependence. A special attention is paid to nonlinear models, from basic threshold formulations to more advanced techniques like Markov switching model and Kalman filter. All the models are accompanied with real-data examples in standard computer packages.
Course objective 課程目標	1. Understand how to analyze financial data properly. 2. Understand how to apply software to perform a analysis
Competence 核心能力	Data analysis and explanation
Prerequisite Course(s) 先修課程或先備能力	Statistics
Teaching Strategies 教學方法	Taught-based course with a term project by using real financial data from TEJ
Course Material 課程教材	Tsay, R. (2010) Analysis of financial time series, Cambridge, Mass.Wiley.
Grading 評量方式	Assignmnet, Course attendance and participation 30% Midterm report: 30% Term project and presentation: 40%
References 參考書目	Enders, W. (2010) Applied econometric time series, Hoboken, NJ :Wiley.
Contact with Teacher 老師聯絡資訊	jywang@nfu.edu.tw

Course Outline 課程進度	
1. Financial Time Series and Their Characteristics (2 weeks) How to obtain the data from database, and how	

to identify the goodness of the data. 2. Linear Time Series Analysis and Its Applications (2 weeks) To understand how to examine the fratures of time series data, and identify the stationary of the financial data. 3. How to use Eviews in basic analysis (2 weeks) Application of empirical data by using Eviews. 4. Conditional Heteroscedastic Models (3-4 weeks) Introduction of ARCH and GARCH-related models is presented in the weeks, and software application of the models are shown. 5. Asignment and test (1 week) 6. High-freqncncy data analysis and market microstructure (2 weeks) Introduction of high-frequency data and how to wash the data are exhibited. 7. Multivariate Time Series Analysis and Its Applications (2 weeks) 8. Markov Chain Monte Carlo Methods with Applications (2 weeks) Why do we need to apply markov switching model in the empirical data? How do we use it to explain the real financial data? 9. Extreme value theory and risk management (2 weeks) The insight of extreme value theory. The application of extreme value to risk management. 10. Final project and presentation	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Networks and Logistics (網路與運籌)
Course Description 課程概述	Study mathematical programming models, methods and applications for networks and logistics
Course objective 課程目標	To apply mathematical programming models and methods for solving practical networks and logistics problems
Competence 核心能力	1. Mathematic methods and statistical techniques 2. Decision-making and planning techniques 3. Innovative thinking and the ability to solve problems independently 4. Applying industrial engineering and management knowledge to analyze and solve practical problems 5. International language communication skills
Prerequisite Course(s) 先修課程或先備能力	none
Teaching Strategies 教學方法	Lecture, computer practice, paper discussion
Course Material 課程教材	Class notes
Grading 評量方式	Midterm 30%, Homework and paper discussion 30%, Final 40%
References 參考書目	none
Contact with Teacher 老師聯絡資訊	yhsieh@nfu.edu.tw http://sparc.nfu.edu.tw/~yhsieh/3w.htm

Course Outline 課程進度	
（Part 1: week 1 to week 9） **1. Introduction of Graphs & Networks** A preview of graph & network problems to be studied in this course **2. Network Models** Transportation problem Linear assignment problem Airline crew assignment Generalized assignment problem Quadratic assignment problem **3. Set Covering Problem** Mathematical model Applications （Part 2: week 10 to week 18）	**4. Location Problems** Location without calculus Webers Problem (location in the plane) Location of multiple facilities in the plane Median problem in a network Center problem in a network Simple (uncapacitated) plant location **5. Assembly Line Balancing** Math programming model & methods: Kilbridge & Wester Ranked positional weight method Reversed ranked positional weight method COMSOAL Genetic algorithm

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	Production Management and Practice (生產管理與實務)
Course Description 課程概述	This course introduces students to Production Management 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 basic concepts of Production Management 2. To be familiar with the analytical methods and their applications in the realm of products and services
Competence 核心能力	● Practical skill set for the job of Production Management ● 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	Operations Management, 13rd ed., William J. Stevenson, McGraw Hill
Grading 評量方式	● Midterm exam: 40% ● Presentation: 45% ● Participation: 15%
References 參考書目	None
Contact with Teacher 老師聯絡資訊	yinglienlee@gmail.com
Course Outline 課程進度	

● Chapter 1 Introduction to Operations Management ● Chapter 2 Competitiveness, Strategy, and Productivity ● Chapter 3 Forecasting ● Chapter 5 Strategic Capacity Planning for Products and Services ● Chapter 6 Process Selection and Facility Layout	● Chapter 8 Location Planning and Analysis ● Chapter 11 Aggregate Planning and Master Scheduling ● Chapter 12 MRP and ERP ● Chapter 13 Inventory Management ● Chapter 16 Scheduling
Remarks 備註	

Courses taught in English

Course title 課程名稱	Applied Statistics (應用統計學)
Course Description 課程概述	1. Introduction of statistical theory. 2. Computer software coding.
Course objective 課程目標	Application of statistical models for solving management problems.
Competence 核心能力	Statistical models and computer coding.
Prerequisite Course(s) 先修課程或先備能力	None.
Teaching Strategies 教學方法	Lecture and computer software application.
Course Material 課程教材	Probability and Statistics with Integrated Software Routines by Deep, Ronald. ISBN: 9780080480381
Grading 評量方式	Homework assignment 30%, Mid-term exam. 30%, Final exam. 40%
References 參考書目	Mathematical statistics with applications by Wackerly, Mendenall and Scheaffer.
Contact with Teacher 老師聯絡資訊	Email:jphuagn@nfu.edu.tw Tel:05-6315714

Course Outline 課程進度	
1. Coding on Excel. 2. Statistical estimation. 3. Statistical tests. Mid-term exam. 4. Analysis of Variance. 5. Chi-squares tests. 6. Regression models. 7. Data clustering. Final exam.	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Technology Management （科技管理）
Course Description 課程概述	This course provides a series of strategic frameworks for managing high-technology businesses. The emphasis throughout the course is on managing technology-oriented established firms, or starting technology-driven startups. The class consists of lectures, case studies, and discussion among students. As result, students will be asked to analyze, discuss, and present the selected articles during the class.
Course objective 課程目標	After this class, students will be able to (1) select and apply disciplinary knowledge in discussing and creating innovative technological solutions; (2) research, analyze and propose solutions to technology business issues; (3) prepare written professional reports; and (4) deliver well-structured presentations.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	Lectures, presentations, and discussion

Course Material 課程教材	• Schilling, M. A. (2012). Strategic Management of Technological Innovation (4th ed), US: McGraw-Hill Education. • Assigned articles and cases
Grading 評量方式	Classroom participation.....30% Mid-term exam.....20% Final Project .....30% Final Exam 20%
References 參考書目	Fortune; Harvard Business Review; Sloan Management Review; California Management Review; Bloomberg; Inc.; Fast Company
Contact with Teacher 老師聯絡資訊	

Course Outline 課程進度	
I. The nature of technological innovation II. The strategic impact of technological change III. Technology and competitive advantage IV. Innovation patterns V. Emerging vs. established technologies VI. Technological innovation and strategic management VII. Managing technology strategies and the innovation process VIII. Technological innovation and entrepreneurship IX. Lessons from technological firms	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Behavioral Finance (行為財務)
Course Description 課程概述	Behavioral finance plays a more and more important role in the development of financial management and investment. This course focused on the behavioral factors which influence financial markets and investors. People are all prone to having psychological preconceptions or biases that make us behave in certain ways. These biases influence how we assimilate the information we come in contact with on a daily basis.
Course objective 課程目標	This course targets the link between the peculiarities of human behavior and aspects of financial and investment management, as well as corporate and risk management. Students should understand and develop skills for taking into account behavioral factors in various aspects of financial markets and operation of corporations.
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 and discussion
Course Material 課程教材	Nofsinger, R. John, 2001,*Investment Madness*, Prentice Hall, 2001 Journal of behavioral finance
Grading 評量方式	mid-exam 30% final exam 40% presentation and participation 30%
References 參考書目	Montier, James, 2002, *Behavioral Finance: Insight into irrational Minds and Markets*, John Wiley & Sons, Ltd
Contact with Teacher 老師聯絡資訊	chilin@nfu.edu.tw

Course Outline 課程進度	
X. Your Behavior matter	XVIII. Mental accounting and diversification
XI. Overconfidence	XIX. That's not the way I remember it
XII. Overconfidence and investing	XX. What I know is better
XIII. Status quo- or what I own is better	XXI. The internet investor
XIV. Seeking pride and avoiding regret	XXII. Exuberance on the net
XV. Double or nothing	XXIII. Self-control or the lack of it

XVI. Social aspects of investing XVII. Mental accountingr	XXIV. Battling your biases
Remarks 備註	

Courses taught in English

Course title 課程名稱	Strategic Management (策略管理)
Course Description 課程概述	Lecture and case study will be used primarily. First of all, Professor will introduce overall content of each chapter by power point presentation. Then students will be assigned to do case study. Besides, paper work will be completed after class.
Course objective 課程目標	This course aims to introduce the topics of strategic management, including the introduction of strategic management, external environment analysis, international resources analysis, business-level strategy (strategic positioning and competitive advantages, etc.), corporate-level strategy (growth strategy and diversification, etc.), strategic alliance, merger and acquisition strategy, international strategic management, strategy innovation and entrepreneurship and strategy implementation. Students can comprehend the importance and impacts of strategic management on the operations of contemporary firms, and learn to formulate an appropriate strategy of a company. In addition, by discussing real cases, the students also can understand the practices of strategy of firms. By doing so, the students can apply the concepts of strategy in analyzing real cases.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	Lecturing, Case Analysis, Field trip, and Interview with entrepreneur
Course Material 課程教材	Hill, Schilling, and Jones (2017), Theory of Strategic Management with cases, 13 th edition, South-Western Cengage Harvard Business Review, Journal of Strategy Management
Grading 評量方式	Case analysis 30%、Participation 30%、Final Project 40%

References 參考書目	Hill, Schilling, and Jones (2017), Theory of Strategic Management with cases, 13 th edition, South-Western Cengage
Contact with Teacher 老師聯絡資訊	evehsu@ms22.hinet.net

Course Outline 課程進度	
Introduction to the cause Ch1 Strategic Leadership Case 1: GE's Ecomagination Strategy Ch2 External Analysis Case 2: The U.S. Airline Industry Ch3 Internal Analysis Case 3: Competitive Advantage at Starbucks Ch4 Building Competitive Advantage Through Functional-Level Strategy Case 4: Lean Production at Virginia Mason Ch5 Building Competitive Advantage Through Business-Level Strategy Case 5: Lululemon Ch6 Business- Level Strategy and the Industry Environment Case 6: Consolidating Dry Cleaning	Ch7 Strategy and Technology Case 7: The Rise of Cloud Computing Ch8 Global Strrategy Case 8: Avon Products Ch9 Corporate-Level Strategy: Horizontal Integration, Vertical Integration, and Strategic Outsourcing Case 9: The Rapid Consolidation of the U.S. Airline Industry Ch10 Corporate-Level Strategy: Formulating and Implementing Related and Unrelated Diversification Case 10: VF Corp. Acquires Timberland to Realize the Benefits from Related Diversification

Remarks 備註	

Courses taught in English

Course title 課程名稱	Information Managemen (資訊管理)
Course Description 課程概述	a. IT/IS and strategic advantage- strategy formulation for IT/IS; conceptual models for identifying strategic IT/IS opportunities and applications, e.g. stage hypotheses, applications portfolio, strategic grid, critical success factors. b. Analysis and review of some major decisions to be taken with regard to deployment of IS/IT resources- e.g. rightsizing, end-user computing, outsourcing, business process re-engineering. c. Management of IT/IS investment- issues related to information value and IT/IS value; management if IT/IS costs and benefits; review of traditional and recent investment appraisal techniques; risk in IT/IS projects. d.Structure and control of IT/IS activities- location in the organization; organization of the IS/IT department; steering committees; IT/IS director; spending patterns; appraisal of IS/IT projects; responsibility accounting for IT/IS projects.
Course objective 課程目標	a.To enable perception of why, where and how information technology/systems should be linked with formulation of business strategy. b.To examine from the strategic perspective the organization, control, monitoring and evaluation of information technology/systems activities. c.To understand the main issues concerned with the economics aspects of information technology/systems.
Competence 核心能力	
Prerequisite Course(s) 先修課程或先備能力	
Teaching Strategies 教學方法	Oral presentation, case discussion
Course Material 課程教材	Business Driven Information Systems, the fifth edition
Grading 評量方式	Presentation 40% Participation and Discussion 20% mid-exam/report 20%

	final-exam/report 20%
References 參考書目	
Contact with Teacher 老師聯絡資訊	lgcwow@gmail.com
Course Outline 課程進度	

Foundation Concepts	Foundations of Information systems in business competing with information technology
	information technology
information technology	computer hardware computer software data resource management telecommunications and networks
business applications	e-business system enterprise business system electronic commerce systems decision support systems
development process	developing business/IT strategies developing business/IT solutions
Manaement Challenges	security and ethical challenges enterprise and global management of information technology

Remarks 備註	

Courses taught in English

Course title 課程名稱	Project Discussions (II) 專題討論(二)
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. Design Research Methods 2. Project Discussions (I)
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	Lecture 10-11: Discussions and feedbacks Lecture 12: Studying the second chosen topic Lecture 13: Analysing detailed contents and structures Lecture 14-15: Preparing and Working with the intended presentation Lecture 16-17: Visualising and finalizing the work Week 18 Final Term Exam

Week 9 Mid Term Exam	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Research in Interactive Media and Innovation (互動媒體與創新設計研究)
Course Description 課程概述	1.Doing research and discussion on the new media application. 2.Learning design thinking approach 3.To explore and find out the possibilities of new media application for innovation
Course objective 課程目標	On completion of this course according to course goals, the student should be able to: 1.Doing research and discussion on new media application. 2.Learning design thinking approach 3.To explore and find out the possibilities of new media application for innovation
Competence 核心能力	Digital Technology 數位技術 Communication and Integration 溝通整合
Prerequisite Course(s) 先修課程或先備能力	Basic capabilities: Design authoring tool
Teaching Strategies 教學方法	Lecture, paper discussion and project practice
Course Material 課程教材	Design & Thinking 設計與思考 **2018-5 Publisher: Basic Books**
Grading 評量方式	Assessments:: 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)

	平時：40% 期中報告：30% 期末報告：30%
References 參考書目	
Contact with Teacher 老師聯絡資訊	whcheng@nfu.edu.tw

Course Outline 課程進度	
Week 1: Syllabus and brief introduction to new media Week 2: Discussion for new media and related technology terminology Week 3: Doing research and discussion on the new media application. Week 4: Paper reading: visual communication Week 5: Paper reading: interaction design and psychology Week 6: Discussion theory of design thinking approach Week 7: Mid-term: Presentation for Case study Week 8: Mid-term: Presentation for Case study Week 9: Mid-term: Presentation for Case study Week 10: Discussion theory of design thinking approach Week 11: To explore and find out the possibilities of new media application for innovation Week 12: Donald Norman theory: good design Week 13: Donald Norman theory: bad design Week 14: To do research on the new media application for arts, products or any possibility application Week 15: To do research on the new media application for arts, products or any possibility application Week 16: Final exam: Case study practice Week 17: Final exam: Case study practice Week 18: Final exam: Case study practice	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Creative Industries in Cultural Research （文化創意產業研究）
Course Description 課程概述	Cultivation of cultural and creative industries based design ability
Course objective 課程目標	Understand the meaning of design and methods
Competence 核心能力	Visual cultural and creative design
Prerequisite Course(s) 先修課程或先備能力	Photoshop and Illustrator
Teaching Strategies 教學方法	Project Work & class discussion
Course Material 課程教材	Visual Communications Design
Grading 評量方式	Project Work report
References 參考書目	Visual Communications Design Creative Industries in Cultural Research
Contact with Teacher 老師聯絡資訊	Tel:0988390795 Mail:juewuhaw@yahoo.com.tw

Course Outline 課程進度	
1. Set a theme of cultural and creative 2. Collection of cultural and creative information 3. Cultural and creative industries field visits 4. Midterm report 5. Creative design 6. analysis Creative Industries in Cultural Research 7. Creative design work 8.Final Report	

Remarks 備註	

Courses taught in English

Course title 課程名稱	Database Management (資料庫管理)
Course Description 課程概述	This course aims at giving students an understanding of advanced database concepts, terminologies and technologies.
Course objective 課程目標	The student will learn the theoretical and practical knowledge about data processing from both the technical and organization perspectives.
Competence 核心能力	Database management, data processing, big data analysis.
Prerequisite Course(s) 先修課程或先備能力	NA
Teaching Strategies 教學方法	Lectures, discussions
Course Material 課程教材	Ref: Jeffrey D. Ullman, Jennifer Widom, A First Course in Database Systems.
Grading 評量方式	Exams, projects.
References 參考書目	NA
Contact with Teacher 老師聯絡資訊	ythou@nfu.edu.tw (侯雍聰)

Course Outline 課程進度	
Week 1 Database System Introduction Week 2 Overview of a Database Management System Week 3 Relational Model of Data Week 4 Algebraic Query Language Week 5 Design Theory of Relational Database Week 6 Database Schema Week 7 High-Level Database Model Week 8 E/R Model Week 9 Midterm	Week 10 Advanced Data processing Week 11 Big Data I Week 12 Big Data II Week 13 Big Data III Week 14 Big Data analysis Week 15 Map and Reduce Week 16 RDD Week 17 Spark system Week 18 Final Exam

Remarks 備註	

Courses taught in English

Course title 課程名稱	Machine Learning and Big Data (機器學習與大數據)
Course Description 課程概述	The course will discuss recent applications of machine learning, such as to robotic control, data mining, autonomous navigation, speech recognition, and text and web data processing.
Course objective 課程目標	Help students obtain the skills of: 1. Processing of Big Data 2. Ability to adopt algorithms, such as linear regression, decision trees, neural network, etc.
Competence 核心能力	Data processing, Algorithms
Prerequisite Course(s) 先修課程或先備能力	Knowledge of basic computer science principles and skills, at a level sufficient to write a reasonably non-trivial computer program.
Teaching Strategies 教學方法	Instructor introduces the concepts and provides some workshop for students.
Course Material 課程教材	Data Science from Scratch, Joel Grus, O'Reilly
Grading 評量方式	Attendance 20%, Workshop 20%, Midterm exam 30%, Final-term project 30%
References 參考書目	
Contact with Teacher 老師聯絡資訊	05-6315742 drhu@nfu.edu.tw

Course Outline 課程進度	
Big Data • Data Source • Data Quality • Data Integration • Open Data • Data Modeling Machine Learning	• Python fundamental • Visualizing Data • k_-Nearest Neighbors • Linear Regression • Decision Trees • Neural Networks • Clustering
Remarks 備註	

Courses taught in English

Course title 課程名稱	Web Technology Application and Integration (Web 技術應用與整合)
Course Description 課程概述	The Application and Integration of 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 back-end techniques in web design. Upon completion of this course, students should have a thorough knowledge of all areas of web page design. Topic of back-end techniques includes building IIS web servers, ASP.NET scripting language, and MSSQL database. By the end of this course, students should have a solid understandingof 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. Integrating HTML5 and CSS3 with ASP.NET MVC into web page design 2. Understanding computer programming languages using C# 3. Advanced use of 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 ASP.NET MVC 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 : 9 point 4. Internationalization and Foreign Language Competency : 9 point
Prerequisite Course(s) 先修課程或先備能力	We strongly suggest that students should have a basic working knowledge of HTML5 and CSS3 coding as well as RWD web design.
Teaching Strategies	Material for this course will be presented using multiple teaching

教學方法	approaches, including lecture and discussion, exploration and inquiry, field experiences, cooperative group work, and demonstrations.
Course Material 課程教材	Title: ASP.NET MVC 5 with Bootstrap and Knockout.js Publisher: O'Reilly Media, Inc. ISBN: 978-1-78839 -731- Author: Jamie Munro
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 30% 3. Homework 40% *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 ● Bootstrap By Example by Silvio Moreto ● Learning Bootstrap 4 by Matt Lambert
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

Course Outline 課程進度	
1. Introduction to MVC	9. URL Routing Using Attributes
2. Introduction to Bootstrap	10. Fat Model, Skinny Controller
3. Introduction to Knockout.js	11. Building a Shopping Cart
4. Working with a Database	12. Building the Data Model

5. Listing, Sorting and Paging Through Tables 6. Working with Forms 7. Server-Side ViewModels 8. Introduction to Web API	13. Implementing the Layout 14. Lists of Books 15. Adding Items to the Cart 16. Project and team group discussion
Remarks 備註	

Courses taught in English

Course title 課程名稱	Organic Electro-Optics Devices （有機光電元件）
Course Description 課程概述	This course introduces the theorems in organic electro-optic devices, such as the basic understanding of charge carrier injection, transport and recombination in organic thin films; device architectures of organic light emitting diodes (OLED); the physics of OLED; metal/organic contact engineering; fabrication of organic electroluminescence device; measurement of device characteristics; improvement of lifetime; and the application of OLEDs in display panel.
Course objective 課程目標	The students will understand the principle and applications of organic electro-optics devices. They also will learn how to fabricate the OLED devices and measure the device characteristics by semiconductor processes and technology.
Competence 核心能力	Physics of organic electro-optics devices Technology of organic electro-optics devices, such OLED lighting and 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	OLED Fundamentals: Materials, Devices and Processing of OLEDs Edited by Daniel J. Gaspar, Evgueni Polikarpov CRC Press, Taylor & Francis Group, 2015
Grading 評量方式	1. Midterm exam (30%), 2. Oral Presentation (40%), 3. Finial report (40%)

References 參考書目	1. Efficient Organic Light-Emitting Diodes, Yi-Lu Chang, 2015 2. Organic Light Emitting Diodes: Principles, characteristics, and processes Jan Kalinowski, New York Marcel Dekker, 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. Introduction of flat panel display technology 2. Theorem of organic light-emitting diodes 3. Fluorescence organic emitting materials 4. Phosphorescence organic emitting materials 5. Luminance efficiency and lifetime of the organic light-emitting diodes	6. Design of the organic light-emitting diode 7. Organic light-emitting diode display technology 8. Introduction of organic solar cells 9. Introduction of organic thin film transistors
Remarks 備註	

Courses taught in English

Course title 課程名稱	Surface Analysis of Materials （材料表面分析）
Course Description 課程概述	This course will review important surface analysis techniques and their principles of materials to establish related background knowledge for master students.
Course objective 課程目標	Let students who take this course have concepts of various surface analysis techniques of materials in mind and could apply the knowledge to researches and works in the future.
Competence 核心能力	Concepts along with principles and applications of various surface analysis techniques.
Prerequisite Course(s) 先修課程或先備能力	Materials Analysis
Teaching Strategies 教學方法	Explaining, describing and demonstration in class

Course Material 課程教材	Self-made
Grading 評量方式	mid-term exam 25%, final exam 25%, topic report 30%, 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 3rd week	AES, XPS and HREELS
4th to 5th week	SIMS and FIB
6th to 8th week	STEM, STM and AFM
10th to 12th week	LEED, RHEED and GIXRD
13th to 17th week	Topic reports

Remarks 備註	