107/1 Courses taught in English(107 學年度第 1 學期全英文授課課程表)

No. 編號	Department 開課系所	Course Code 課號	Course Title 科目名稱	Required/ Elective 必修/選修	Credit Points 學分數	Instructor 授課老師	Course Description 課程說明
1.	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2489	Dynamics of Multibody Systems （多體動力學）	Elective 選修	3	Yunn-Lin, Hwang 黃運琳	Course Outline
2.	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2485	Micromachining Technology （微細加工學）	Elective 選修	3	Yunn-Lin, Hwang 黃運琳	Course Outline
3.	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2488	Biofabrication （生醫製造學）	Elective 選修	3	Cho-Pei, Jiang 江卓培	Course Outline
4.	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2483	Practical Transmission Engineering （傳動工程實務）	Elective 選修	3	Long-Chang, Hsieh 謝龍昌	Course Outline
5.	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2484	Biosolid Mechanics （生物力學）	Elective 選修	3	Samuel I-En, Lin 林依恩	Course Outline
6.	Institute of Mechanical and Electro-Mechanical Engineering(動力機械工程系機械與機電工程博士班)	2531	Friction Engineering （摩擦工程）	Elective 選修	3	Jeng-Haur, Horng 洪政豪	Course Outline

7.	Institute of Mechanical Design Engineering(機械設計工程系碩士班)	0255	Applied Flow Control （應用流動控制）	Elective 選修	3	Ching-Min, Hsu 許清閔	Course Outline
8.	Institute of Automation Engineering(自動化工程系碩士班)	0052	Autonomous Unmanned Vehicle System （自動化無人載具系統）	Elective 選修	3	Meng-Tse, Lee 李孟澤	Course Outline
9.	Institute of Automation Engineering(自動化工程系碩士班)	0053	Artifcial Intelligent Robotics （智慧型機器人）	Elective 選修	3	Yeung-Jaw, Jih 季永炤	Course Outline
10.	Institute of Electrical Engineering (電機工程系碩士班)	0135	FPGA Circuits Design FPGA （電路設計）	Elective 選修	3	Chi-Chia, Sun 宋啟嘉	Course Outline
11.	Institute of Electrical Engineering (電機工程系碩士班)	0139	Embedded Systems （嵌入式系統）	Elective 選修	3	HUI-KAI, SU 蘇暉凱	Course Outline
12.	Institute of Electronic Engineering （電子工程系碩士班）	0084	Applied Electric Circuits （應用電路學）	Elective 選修	3	Yu-Sung, Liu 劉育松	Course Outline
13.	Institute of Information Management(資訊管理系碩士班)	0093	Business Intelligence （商業智慧）	Elective 選修	3	Yung-Tsung, Hou 侯雍聰	Course Outline
14.	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）	Elective 選修	3	Nian-Ze, Hu 胡念祖	Course Outline
15.	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士	0364	Marketing Management （行銷管理）	Elective 選修	3	Mam-Shin, Cheng 鄭錳新	Course Outline

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16.	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0367	Business Data Analysis （企業資料分析）	Elective 選修	3	Chih-Chin, Liang 梁直青	Course Outline
17.	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0365	Corporate Financial Management （公司財務管理）	Elective 選修	3	Chi-Lin, Lu 呂麒麟	Course Outline
18.	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0381	Global Marketing （全球化行銷）	Elective 選修	3	Yi Hsu 徐怡	Course Outline
19.	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0380	Motivation and Leadership （激勵與領導）	Elective 選修	3	Ching-Hsiang, Liu 劉慶湘	Course Outline
20.	Master program of Business Management of Department of Business administration (企業管理系經營管理碩士班)	0382	Entrepreneurial Management （創業管理）	Elective 選修	3	Yu-Chun, Chen 陳鈺淳	Course Outline
21.	Institute of Industrial Engineering and Management	0338	Production Management and Practice	Elective 選修	3	Po-Chieng, Hu	Course Outline

	(工業管理系工業工程與管理碩士班)		（生產管理與實務）			胡伯潛	
22.	Institute of Industrial Engineering and Management (工業管理系工業工程與管理碩士班)	0334	Quantitative Research Methodology （數量研究方法）	Required 必修	3	Jyun-Ping, Huang 黃俊平	Course Outline
23.	Institute of Industrial Engineering and Management (工業管理系工業工程與管理碩士班)	0333	Seminar 1 （專題討論（一））	Required 必修	3	Chih-Hsiung, Hu 胡智熊	Course Outline
24.	Graduate School of Digital Contents and Creative Industries （多媒體設計系數位內容創意產業碩士班）	0181	Design Research Methods （研究方法特論）	Required 必修	3	Siu-Tsen, Shen 沈思岑	Course Outline
25.	Graduate School of Digital Contents and Creative Industries （多媒體設計系數位內容創意產業碩士班）	0182	Human-Computer Interation Design （人機介面互動設計）	Elective 選修	3	Siu-Tsen, Shen 沈思岑	Course Outline
26.	Graduate School of Digital Contents and Creative Industries （多媒體設計系數位內容創意產業碩士班）	0191	Digital Media Communication （數位媒體傳播）	Elective 選修	3	Siu-Tsen, Shen 沈思岑	Course Outline
27.	Graduate School of Digital Contents and Creative Industries （多媒體設計系數位內容創意產業碩士班）	0180	Project Discussions(I) （專題討論(一)）	Required 必修	3	Siu-Tsen, Shen 沈思岑	Course Outline

28.	Graduate School of Digital Contents and Creative Industries（多媒體設計系數位內容創意產業碩士班）	0183	Research in Digital Media Arts（數位媒體藝術研究）	Elective 選修	3	wen hwa, Cheng 鄭文華	Course Outline

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	Homework, 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	Micro Machining(微細加工學)
Course Description 課程概述	Fundamental fabrication issues for microscale components used in MEMS/Nanotechnology. Understand and designing microfabrication processes based on photolithography and deposition/etching steps.
Course objective 課程目標	Let students understand “Micro Machining” in the applications of industry.
Competence 核心能力	Tech or other science major graduate students who plan their research based on micro/nano systems approaches.
Prerequisite Course(s) 先修課程或先備能力	Those who want to gain broad knowledge about the new micro/nano technology trends.
Teaching Strategies 教學方法	Lectures in class, Class discussion, Mid-term report, Final report, Home-works.
Course Material 課程教材	Lecture Notes
Grading 評量方式	On class discussion, Home-works, Mid-term reports, Final reports.
References 參考書目	1. Yi Qin, *Micromanufacturing Engineering and Technology - A volume in Micro and Nano Technologies.* 2nd Edition, William Andrew, 2015.
Contact with Teacher 老師聯絡資訊	Yunn-Lin Hwang E-mail: hwang@nfu.edu.tw TEL: +886-56315339

Course Outline 課程進度	
1. MEMS (Micro Electromechanical System) 2. Non-MEMS (Non Micro Electromechanical System) 3. Micro Mechanical Cutting 4. Micro turning 5. Micro Drilling 6. Micro Milling	7. Micro Grinding 8. Micro Punching 9. Micro Laser Cutting 10. Micro Extrusion 11. Micro Embossing 12. Micro Injection 13. Micro moulding

Remarks 備註	

Courses taught in English

Course title 課程名稱	Biofabrication（生醫製造學）
Course Description 課程概述	*Biofabrication* is a practical guide to the novel, inherently cross-disciplinary scientific field that focuses on biomanufacturing processes and a related range of emerging technologies. These processes and technologies ultimately further the development of products that may involve living (cells and/or tissues) and nonliving (bio-supportive proteins, scaffolds) components. The course introduces students to cell printing, patterning, assembling, 3D scaffold fabrication, cell/tissue-on-chips as a coherent micro-/nano-fabrication toolkit. Real-world examples illustrate how to apply biofabrication techniques in areas such as regenerative medicine, pharmaceuticals and tissue engineering.
Course objective 課程目標	1. Students have the ability to describe the principle of biofabrication and the state of art. 2. Can raise the development tendency of biofabrication and artificial organ that relevant to mechanical and electro-mechanical engineering field 3. Can understand the regulation of FDA and market need 4. Can describe the worldwide current program and major project in medicine development
Competence 核心能力	1. Connection modern manufacturing with biofabrication 2. Integration numerical analysis with tissue flow 3. Novel domain description in biofabrication knowledgement 4. Understand the requirement of FDA for medical device 5. Essential requirement for being a biofabrication engineers
Prerequisite Course(s) 先修課程或先備能力	Manufacturing or Material Science and Engineering.
Teaching Strategies 教學方法	PPT presentation with video demonstration. Invited famous scholar to introduce the real cases and share experience. Students need to make group to discuss the given topic or paper. Students need to make their presentation in English to practice the ability of English oral presentation.
Course Material 課程教材	Text book: Biofabrication, refer to **eBook ISBN:** 9781455730049 PPT slide presentation and group discussion
Grading 評量方式	Oral presentation (two cases, 30%), Mid-term exam (20%) and final-term exam (30%), report twice (two cases, 20%)
References 參考書目	Text book: Biofabrication, **Editors:** Gabor Forgacs Wei Sun
Contact with Teacher 老師聯絡資訊	Dr. Cho-Pei Jiang, E-mail: cpjiang@nfu.edu.tw TEL: 631-5395

Course Outline 課程進度	
Week 1	Overview introduction of biofabrication
Week 2	In vitro biofabrication of tissues and organs (part I)
Week 3	In vitro biofabrication of tissues and organs (part II)
Week 4	Invited scholar to give a speech and group discussion
Week 5	Biomaterials for biofabrication of 3D tissue scaffolds (part I)
Week 6	Biomaterials for biofabrication of 3D tissue scaffolds (part II)
Week 7	Topic discussion and paper reading
Week 8	Mid-term exam
Week 9	Projection Printing of Three-Dimensional Tissue Scaffolds with Tunable Poisson's Ratio (part I)
Week 10	Projection Printing of Three-Dimensional Tissue Scaffolds with Tunable Poisson's Ratio (part II)
Week 11	Invited scholar to give a speech and group discussion
Week 13	Fabrication of Microscale Hydrogels for Tissue Engineering Applications
Week 14	Polymeric Membranes for the Biofabrication of Tissues and Organs
Week 15	Topic discussion and paper reading
Week 16	Group presentation
Week 17	Group presentation
Week 18	Final exam
Remarks 備註	

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**	

2.1 Classification of gears
2.2 Nomenclature
2.3 Fundamentals of gearing
2.4 Standard gear
2.5 Tooth action of involute gears

Chapter 3 Gear trains

3.1 Classification of gear trains
3.2 Ordinary gear train
3.3 Planetary gear train
3.4 Application of planetary gear train
3.5 Assembly of planetary gear train

Chapter 4 Kinematic and Efficiency Analysis of Planetary Gear Trains

4.1 Introduction
4.2 Train Value Equation
4.3 Latent Power Theorem
4.4 Mechanical Efficiency Equations
4.5 Design Example
4.6 Conclusion

Chapter 5 Kinematic Design, Efficiency Analysis, Engineering Design, and Prototype Manufacture of Planetary-Gear Hub for Bicycle

5.1 Introduction
5.2 Existing design
5.3 Train Value Equation
5.4 Kinematic design
5.5 Efficiency analysis
5.6 Conclusion

Chapter 6 Meshing Efficiency of Spur Gear train

6.1 Gear applications
6.2 Sliding velocity
6.3 Meshing Efficiency Equation
6.4 Gear reducer
6.5 Meshing Efficiency analysis
6.6 Conclusion

Chapter 7 The Innovative Design of Automatic

Transmission for Electric Motorcycles 7.1 Introduction 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	Friction Engineering(摩擦工程)
Course Description 課程概述	This course focuses on learning the expertise of friction and microfriction for understanding the phenomena of components in friction so that as the goal of improving and controlling component performance.
Course objective 課程目標	Objective for educating students to know the basic friction characteristics and its application in surface engineering of component, and with learning the correlation between Macro-Friction and Micro-Friction.
Competence 核心能力	1. Develop students' interdisciplinary knowledge in friction and Engineering design. 2. Develop students' capabilities in innovative thinking and problem-analysis with structural and systematic. 3. Develop students' capabilities in international trend and innovation application of friction technology.
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	Teaching materials: Self-made Teaching methods: Teaching in the classroom and laboratory Teaching resources: Laboratory equipment in teaching and learning
Course Material 課程教材	Self-made teaching materials
Grading 評量方式	Quiz, Mid-term exam, Final exam
References 參考書目	Friction Engineering (Writer: L. Blaw ; ISBN: 0471158933)
Contact with Teacher 老師聯絡資訊	05-6315428 jhhorng@gmail.com

Course Outline 課程進度	
Ch.1. Introduction 1.1. What is the friction. 1.2. Word of friction phenomena 1.3. Dry and lubrication friction 1.4. Friction control and impacts **Ch.2. Fundamental of sliding friction** 2.1. Macrocontact, microcontact and nanocontact 2.2. Static friction and stick-slip 2.3. Rolling friction	

2.4. Sliding friction 2.3.1.Models for sliding friction 2.3.2.Statistical approaches for sliding friction 2.5. Friction heating **Ch.3. Effects of tribosystem variables on friction** 3.1. Surface finish and topography 3.2. Load and contact pressure 3.3. Sliding velocity 3.4. Type of sliding motion 3.5. Temperature **Ch.4. Running-in and other friction transition** 4.1. Understanding and interpreting friction transition 4.2. Friction transitions during running-in 4.3. Friction process diagrams 4.4. Friction and wear 4.5. Future development of friction	
Remarks 備註	

Courses taught in English

Course title 課程名稱	Applied Flow Control（應用流動控制）
Course Description 課程概述	This course is intended as a one semester course for graduate students on fundamentals and applications of flow control techniques. Topics to be covered include basic flow control concepts of turbulent shear layer, separated boundary layer, and flow mixing. The improvements of drag force induced by fluid flow, combustion performance, and aerodynamics are going to be investigated and discussed by means of applying flow control techniques.
Course objective 課程目標	The objective is to develop the ability to use appropriate flow control methods to solve fundamental and industrial problems. As a result of taking this course, student should be able to (1) understand basic concept of flow control techniques (2) select and design actuator and sensor (3) understand how to control shear layer and boundary layer separation (4) select appropriate methods for enhancement of mixing and combustion (5) select appropriate methods for reduction of fluid dynamics drag
Competence 核心能力	(1) Ability to analyze system of thermal science and fluid mechanics. (2) Ability to conduct design of flow control actuator. (3) Ability to improve performance of thermal and fluid engineering.
Prerequisite Course(s) 先修課程或先備能力	Fluid Mechanics
Teaching Strategies 教學方法	(1) Lecture Notes (2) Experimental measurements in fluid mechanics (3) Report analysis and improvement of fluid mechanics.
Course Material 課程教材	Self-made materials
Grading 評量方式	(1) Assignments (30 %) (2) Mid-term Examination (30%) (3) Final Project (40%)
References 參考書目	(1) Gad-El-Hak, M., Flow control: passive, active, and reactive flow management, Edinburgh Building, Cambridge University press, Cambridge, 2000. (2) Koumoutsakos, P. and Mezic, I., Control of fluid flow, Berlin, Springer-Verlag, Heidelberg, 2006. (3) Gad-El-Hak, M., Pollard, A., Bonnet, J-P., Fundamentals and applications of modern flow control, Reston, American Institute of Aeronautices and Astronautices, Virginia, 2009.
Contact with Teacher 老師聯絡資訊	Ching Min Hsu/許清閔 cmhsu@nfu.edu.tw TEL: 05-6315345
Course Outline 課程進度	(1) Introduction of flow control (2) Actuator and sensor (3) Control of shear layer (4) Separation control (Boundary layer) (5) Mixing control (Jet) (6) Reduction of fluid dynamic drag (Cylinder) (7) Combustion enhancement (Combustion) (8) Aerodynamic flow control (Airfoil)
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	Artifcial Intelligent Robotics(智慧型機器人)
Course Description 課程概述	This course covers the topics of programming paradigms of an artificially intelligent robot for applications involving sensing, navigation, path-planning, and navigating with uncertainty. Fundamental theories and architectures of the AI robot would be discussed in the class. The student will be asked to do the real robot programming project in the laboratory and evaluated. Pre-AI or Robotics courses are not required. Some basic programming skill and knowledge on microprocessor will be helpful in the learning and implementing the contents of this course although it is not necessary
Course objective 課程目標	1. Fundamental concepts of AI 2. Developing and programming an AI robotic system
Competence 核心能力	Mathematics 40, Science 40, Engineering 20
Prerequisite Course(s) 先修課程或先備能力	English comprehensive ability
Teaching Strategies 教學方法	Course lecture and Lab. Project
Course Material 課程教材	Introduction to AI Robotics, Robin R. Murphy, The MIT Press, ISBN 0-262-13383-0
Grading 評量方式	Projects and report Assignment: 30%; Midterm Examine:30%; Final Examine :40%.
References 參考書目	
Contact with Teacher 老師聯絡資訊	5383 josephj@nfu.edu.tw

Course Outline 課程進度	
Chapter 1: Artificial Intelligence and Robotics Chapter 2: Robot Paradigms Chapter 3: The Hierarchical Paradigm. Chapter 4: Biological Foundations of the Reactive Paradigm.	Chapter 5: The Hybrid Deliberative/Reactive Paradigm. Chapter 6: Multi-agents.

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

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

Remarks 備註	

Courses taught in English

Course title 課程名稱	Applied Electric Circuits（應用電路學）
Course Description 課程概述	This course of 18 weeks long discussing the advanced topics about the Electric Circuits helps students to be familiar with the basic concepts and analyzing skills of electric circuits. Included in this course are the basic circuit elements and their mathematical models, circuit analysis, network functions, network theorems. Throughout the semester, theoretical and mathematical models will be stressed first and then applied to solving the practical and complicated electric circuit problems.
Course objective 課程目標	The main objective of this course is to provide the students with useful information about the following topics: • Understand the mathematical models of basic circuit elements • Solve the complicated circuits and their equivalent circuits and mathematical equations • Compute the system function of a circuit • Evaluate the frequency response of a linear time-invariant circuit • Understand the concepts of network functions and theorems
Competence 核心能力	1. Ability to find the Thevenin and Norton equivalents of two-terminal subnetworks and use those to simplify circuits 2. Ability to find the poles and zeros of a linear circuit 3. Ability to ascertain the output response of a circuit to a pulse-type input by exploiting linearity and time invariance 4. Ability to relate the key features of the impulse and step responses of a first- or second- order circuit to the locations of its poles and zeros 5. Ability to find the spectrum of the output of a linear circuit from the spectrum of the input and the frequency response of the circuit 6. Ability to apply basic network functions and theorems
Prerequisite Course(s) 先修課程或先備能力	Prerequisite material will be reviewed briefly at the beginning of each course. Basic understanding of using Mathematics is necessary.
Teaching Strategies 教學方法	1. Lectures in class 2. Interactive discussion learning 3. Experiment and operation 4. Project study
Course Material 課程教材	Basic Circuit Theory, Charles A. Desoer and Ernest S. Kuh/ McGraw-Hill
Grading 評量方式	1. Quiz and Homework: 20%. 2. Midterm Exam. and/or report: 30%.

	3. Final Exam. and/or report: 30%. 4. Class Attendance and Discussion: 20%.
References 參考書目	Engineering Circuit Analysis, Willian H. Hayt, Jack Kemmerly, Steven M. Durbin/ McGraw-Hill
Contact with Teacher 老師聯絡資訊	E-mail: ysliu@nfu.edu.tw Tel: +886-966333666 Office: DEPARTMENT OF ELECTRONICS ENGINEERING / Room ATC401-1
Course Outline 課程進度	
W1 W2 W3~W4 W5~W6 W7~W8 W9 W10~W11 W12~W13 W14 W15~16 W17 W18	• *Ch1 Circuit Elements and Models* • *Ch2 First-order Circuits* • *Ch3 Second-order Circuits* • *Ch4 Introduction to Linear Time-invariant Circuits* • *Ch5 Coupling Elements and Coupled Circuits* *Midterm Examination* • *Ch6 Node and Mesh Analysis* • *Ch7 Loop and Cut-set Analysis* • *Ch8 State Equations* • *Ch9 Network Functions* • *Ch10 Network Theorems* *Final Examination*
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	Week 12	Big Data Introduction I Week 13
Indicators			Big Data Introduction II Week 14
Week 4	Dimensional Modeling and Data		BI and Big Data System I Week
Warehousing		15	BI and Big Data System II Week
Week 5	Information Retrieval and	16	Advance BI Analytical tools
Transformation		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	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

Global Marketing Management	Cultural Environment 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	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	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	Production Management and Practices(生產管理與實務)
Course Description 課程概述	This course is intended as an introduction to the field of operations management with the emphasis in production management and practice that covers forecasting, process selection and facility layout, scheduling.
Course objective 課程目標	1. Understand the theoretic basis and basic concept of production management. 2. Understand the mathematical applications to the simplified cases in the practical world.
Competence 核心能力	The skill of handling the production management related works in the real world.
Prerequisite Course(s) 先修課程或先備能力	No
Teaching Strategies 教學方法	1. Text book lecturing and discussing. 2. Scheduling cases presentation and discussion
Course Material 課程教材	Operations Management, 12 ed, by William J. Stevenson
Grading 評量方式	Midterm Exam. 40%, Case Report 45%, Attendance 15%
References 參考書目	No
Contact with Teacher 老師聯絡資訊	pchu@nfu.edu.tw

Course Outline 課程進度	
Chap. 1. Introduction to Operations Management Chap. 2. Competitiveness, Strategy, and Productivity Chap. 3. Forecasting Chap. 6. Process Selection and Facility Layout Midterm Exam.	Scheduling case study and illustration Scheduling case study and discussion Scheduling case study and report (Cases 1 and 2) Scheduling case study and report (Case 3) Scheduling case study and report (Case 4) Scheduling case study and report (Case 5) Scheduling case study and report (Case 6)

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	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	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	1. You will identify and solve challenging communication problems through: visualization of gathered data and solutions and the creation of prototypes for evaluation. 2. 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. 3. 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	1. 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	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	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 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

Lecture Week 6-7: Visualization Techniques Lecture • Lecture Week 8: Visualizing and finalizing the work • Week 9: Mid Term Exam	intended presentation • Lecture 16-17: Visualising and finalizing the work Week 18 Final Term Exam
Remarks 備註	

Courses taught in English

Course title 課程名稱	Human-Computer Interaction Design(人機介面互動設計)
Course Description 課程概述	Human-Computer Interaction (HCI) is concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. On the practical side, this means the principles and methods with which one builds effective user interfaces. A basic precept of HCI is that users should be able to get things done through the computer, without having to pay attention to the intricacies of complex software. Interfaces must be accessible, meaningful, visually consistent, comprehensive, accurate, and oriented around the tasks that users tend to perform. The course will provide a balance of practical and theoretical knowledge, giving students experience ordinarily not provided by other courses in the field of multimedia design. Practical concerns will be balanced by discussion of relevant theory from the literature of computer science, cognitive psychology, and industrial design. You will solve problems in homework assignments and on-campus students will participate in group projects to design, implement, and evaluate user interfaces. On completion of this course, you should have (a) practical skills for user interface design, (b) an understanding of the human side of computing, (c) the background to apply theoretical and empirical techniques in HCI, and (d) a good overview of the field.
Course objective 課程目標	On completion of this course according to course **goals**, the student should be able to: • understand the basics of human and computational abilities and limitations. • understand basic theories, tools and techniques in HCI. • understand the fundamental aspects of designing and evaluating interfaces. • practice a variety of simple methods for evaluating the quality of a user interface. • apply appropriate HCI techniques to design systems that are usable by people.
Competence 核心能力	*Definition*: students will be able to recognize and recall terminology, facts and principles For example, students can define 'direct manipulation' and list some of its strengths and weaknesses as an interaction style. *Concept Understanding*: students will be able to determine the relationships between specific instances and broader generalizations. For example, students can determine which parts of a system exhibit direct manipulation features and can explain why a

	change in the system produced different properties. *Directed Application*: students will be able to use concepts and principles to explain, analyze and solve specific situations, often with the applicable concepts implicit in the setting. For example, students can redesign part of an interface to exhibit direct manipulation style and predict the likely effects of the change. *Realistic Problem Solving*: students will be able to apply course content in coping with real life situations. These differ from directed applications by having less structured questions and issues, no direction as to which concepts will be applicable and a range of potentially acceptable answers. For example, students can design an interface for real tasks and users which incorporates direct manipulation in appropriate ways (and evaluate/defend their choices).
Prerequisite Course(s) 先修課程或先備能力	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	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: 2. Authoring and maintaining a WordPress blog throughout the semester on a specific topic of his/her choice 3. Applying concepts learned in class to self-promote his/her blogs using social media 4. Completing assessments on topics explained in lecture and online materials 5. Utilizing skills explained in online and in-class tutorials, like HTML and iMovie to complete digital media projects

	6. Writing a reflection on his/her course experience 7. Creating an effective online brand and presence 8. A collection of writing samples and multimedia projects to be used in a senior portfolio
Prerequisite Course(s) 先修課程或先備能力	N/A
Teaching Strategies 教學方法	• Oral presentations and interactive discussions
Course Material 課程教材	Baym, N. (2010). Personal Connections in the Digital Age. Cambridge, UK: Polity
Grading 評量方式	This digital media communication course is designed to build skill, and an essential part of that skill-building is practicing and questioning. Your participation during the class lectures, and your reading of other students' participatory questions and trials, is therefore an essential element of learning. In the weekly schedule for our class contained at the bottom of this syllabus, you'll notice that I ask you to participate by answering questions and posting information during each lecture. To gain credit for that participation, you should make your contributions *during the week that a lecture is introduced*: the specific due date for participation is listed in each week's schedule. Informed, prepared, thoughtful, active participation in class activities and discussion, in a manner that is respectful of and responsive to your peers, will result in a high class participation grade. Carelessness, lack of preparation, inactivity, unresponsiveness and disrespect toward peers will lead to a lower class participation grade. You must positively engage to earn a score. Scores will range from 100 (Outstanding) to 90 (Excellent) to 80 (Good) to 70 (Acceptable) to 60 (Unacceptable) to 0 (None).
References 參考書目	N/A
Contact with 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 10: Performing identity though social media, continued. • Lecture 11: Youth and discourse about social media • Lecture 12: Gender and sexuality issues

• 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 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	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: 4. Develop and initially determine and exemplify a design programme based on their own selected project brief (What). 5. Develop and initially reflect on methods and working processes with reference to the planning and determination of a design programme (How). 6. Present, justify and critically discuss students' own proposed design programme (Why).
Competence 核心能力	9. Planning and development of a design programme 10. 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	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	
Contact with Teacher 老師聯絡資訊	My research office is located in A&H building 5TH Floor. Office telephone: 05-631-5878 Email: stshen@nfu.edu.tw

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

Remarks 備註	

Courses taught in English

Course title 課程名稱	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: Chapter1- New Aesthetics 3. Week3: Lecture/ Lecture & Discussion: Chapter1-	10. Week10: Lecture/ Lecture & Discussion: Chapter3- New Education 11. Week11: Lecture/ Lecture & Discussion: Chapter3- New Body

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	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	