②國玄東華大學

教學計劃表 Syllabus

次子可宣化 Oyliabuo							
課程名稱(中文) Course Name in Chinese	AB				學年/學期 Academic Year/Semester		113/1
課程名稱(英文) Course Name in English	Numerical Analysis						
科目代碼 Course Code	AM_5210AB	系級 Department & Year			開課單位 Course-Offering Department		
修別 Type	Requi red	學分數/時間 Credit(s)/Hour(s)			3.0/3.0		
授課教師 Instructor	/						
先修課程 Prerequisite							
課程描述 Course Description							

This course focuses on fundamental numerical methods and advanced iterative approaches for intelligence numerical computation. It will first introduce numerical and symbolic integration, differentiation and iterative approaches respectively for solving hyper-plane fitting, linear systems and nonlinear systems, further addressing on nonlinear function approximation, unconstrained optimizations based on the gradient method, the Newton-Gauss method and the Levenberg-Marquardt method and annealed Kullback-Leibler divergence minimization for solving data clustering, density estimation, independent component analysis, computational self-organization and classification

課程目標 Course Objectives

The course objective is to introduce advanced numerical approaches for unconstrained optimization and constrained optimization and explore applications for solving nonlinear systems, function approximation, integer programming and mixed integer programming.

		課程目標與系專業能 力相關性
	糸專業能力	Correlation between
	Basic Learning Outcomes	Course Objectives and Dept.'s Education Objectives
А	Have well-founded expertise in mathematics and be	
	capable of logical reasoning.	
В	Be able to study other fields of science so as to conduct interdisciplinary research in the future	
С	Be capable of independent thinking and have the problem solving skills.	

圖示說明Illustration : ● 高度相關 Highly correlated ○中度相關 Moderately correlated

授課進度表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	Introduction	
2	Matlab programming	
3	Li near and Nonli near System Solvin	
4	Line fitting, hyperplane fitting, quadratic-surface fitting	

5	Functi on approximati on						
6	Newton method and Newton-Gauss method						
7	Levenberg-Marquardt metho						
8	Recursive function approximation						
9	Midterm Exam						
10	Differential equation approximation						
11	Cl assi fi cati on I						
12	Classifiaction II						
13	Kullback-Leibler divergence minimization						
14	Mean field annealing						
15	Of sutering and density function approximatio						
16	Sel f-organi zati on						
17	Applications						
18	Fi nal Exam						
	教 學 策 略 Teaching Strategies						
✓	Lecture Group Discussion Field Trip						
Mi:	MI scel I aneous:						
	教學創新自評 Teaching Self-Evaluation						
(I nnovati ve Teachi ng)						
	(PBL) (SBL)						
	Flipped Classroom						
((Soci al Responsi bility)						
	Community Practice Industy-Academia Cooperation						
((Transdi sci pl i nary Proj ects)						
	Transdi sci pl i nary Teachi ng Inter-col l egi ate Teachi ng						
Courses Co-taught with Industry Practitioners							
othe	r: 						
ĺ							

學期成績計算及多元評量方式 Grading & Assessments									
配分項目	配分比例	多元評量方式 Assessments							
Items	Percentage	測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
() General Performance (Attendance Record)	10%		~						
Midterm Exam	30%	>							
Fi nal Exam	30%	>							
Homework and/or Assignments	30%		~						
Miscel I aneous									

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目(書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

Numerical mathematics and computing, four Edition, Cheney & Kincaid Numerical methods with MATLAB: Implementation and application, G. Rechtenwal

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

http://134.208.26.59/AdvancedNA/2006.htm#1

其他補充說明	(Supplemental	instructions)
	COUDDICHCHLAI	THOU DUCTIONS