


**國立東華大學**  
**教學計劃表 Syllabus**

課程名稱(中文) Course Name in Chinese	光電數值分析與計算			學年/學期 Academic Year/Semester	112/1
課程名稱(英文) Course Name in English	Numerical analysis and calculation for Opto-electronics				
科目代碼 Course Code	OE_10350	系級 Department & Year	學四	開課單位 Course-offering Department	光電工程學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/李政誼				
先修課程 Prerequisite					
課程描述 Course Description					
課程分為兩部分：上部分介紹matlab程式語言的撰寫方式與程式邏輯、資料處理與分析。下部分介紹常用的數值方法解決光電工程問題。					
課程目標 Course Objectives					
以程式語言及數值方法處理光電領域的計算問題					
系專業能力 Basic Learning Outcomes					課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	具有光電相關的物理、化學、材料及數學的知識。Physics, chemistry, material, and math knowledge related to opto-electronic engineering				●
B	具有光電工程的專業知識及應用能力。Professional knowledge and application ability of opto-electronic engineering				●
C	具有設計與執行實驗、報告撰寫與數據解釋之能力。Abilities to design and execute experiment, write reports, and explain data				●
D	使用儀器進行物件的分析及測試。Analysis and test of devices by instruments				○
E	具備適當的英文能力，應用於學習與交流。English language ability to study and interact				○
F	具有良好的溝通與團隊合作的能力。Ability to communicate and teamwork				●
G	具有創新思維及終身學習的能力。Creative thinking and life-long learning ability				○
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	Environments of matlab, Script-M file, and Basic operation				
2	Basic operation, array, and matrix calculation				
3	Basic 2D/3D graphics				
4	Basic 2D/3D graphics & Structured programming				

5	Structured programming	
6	M Function files	
7	Data input/output and symbol calculation	
8	Optoelectric application	
9	期中考試週 Midterm Exam	
10	Computing integrals	
11	Computing integrals and Application: Diffraction theory and Ordinary differential equations	
12	Ordinary differential equations and application: Laser rate equation	
13	Nonlinear algebra equations and Optimization	
14	Nonlinear algebra equations and Optimization	
15	Curve fitting	
16	Numerical Solution of the Schrödinger Equation	
17	期末考試週	
18	Numerical Solution of the Schrödinger Equation	

教學策略 Teaching Strategies

- 課堂講授 Lecture
  分組討論 Group Discussion
  參觀實習 Field Trip  
 其他 Miscellaneous:

教學創新自評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

- 問題導向學習(PBL)
  團體合作學習(TBL)
  解決導向學習(SBL)  
 翻轉教室 Flipped Classroom
  磨課師 Moocs

社會責任(Social Responsibility)

- 在地實踐 Community Practice
  產學合作 Industry-Academia Cooperation

跨域合作(Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching
  跨院系教學 Inter-collegiate Teaching

- 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

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學期成績計算及多元評量方式 Grading & Assessments

配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		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
平時成績 General Performance	10%								
期中考成績 Midterm Exam	25%								
期末考成績 Final Exam	25%								
作業成績 Homework and/or Assignments	20%								
其他 Miscellaneous (小考4次)	20%								

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.)

PPT Lectures

References:

1. matlab 設計入門,

<http://mirlab.org/jang/books/matlabprogramming4beginner/>

2. Programming for Computations - MATLAB/Octave, A Gentle Introduction to Numerical Simulations with MATLAB/Octave

Authors: Svein Linge and Hans Petter Langtangen

Free for download: <https://link.springer.com/book/10.1007%2F978-3-319-32452-4>

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.)

課程講義放置於東華e學苑 <http://www.elearn.ndhu.edu.tw/moodle/>

線上教學連線資訊, 也會一併公布在東華e學苑 <http://www.elearn.ndhu.edu.tw/moodle/>

其他補充說明 (Supplemental instructions)