

# 光電數值計算 Computational Methods for Optoelectronics, IPT 526000

Time: **T2T3T4** (09:00-12:00, Tuesday), at Room **210**, EECS bldg.

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- **Course Description** 課程資訊:

- 對許多光電問題而言，我們常常無法由數學方法得到其解析解。這類的問題便須要使用各種不同的數值技巧來求解，因此，在本課程中，我們將以光電領域中的實際問題作為例子，教授學生如何用數值技巧來解問題。
- Fundamental numerical simulation techniques for solving Optoelectronics related problems.
- Taking this course you are asked to program by yourself.
- Although this course is given primarily for the first year graduate students, those who are undergraduates or senior graduates are encouraged to take this course.
- Background: No required but you must learn how to program in C/C++, Fortran, Matlab, Mathematica, or Maple (at least one of these programming languages).

- **Text Books and References** 教科書及參考書:

1. W. H. Press et al., "Numerical Recipes (in C, C++, or Fortran)," Cambridge University Press (1992).
2. W. Y. Yang et al., "Applied Numerical Methods Using MATLAB," Wiley (2005).
3. T.-C. Poon and T. Kim, "Engineering Optics with Matlab," World Scientific (2006).

- **Teaching Method** 授課方式:

in-class lectures with examples and projects studies.

- **Syllabus** 教學進度:

1. Introduction and Demonstration,
2. interpolation, Curve Fitting, and Integration,
3. Ordinary Differential Equations,  
Homework # 1: two-weeks to finish,
4. Partial Differential Equations,
5. Nonlinear Equations and Nonlinear PDE,  
Homework # 2: two-weeks to finish,
6. Eigenvalues and Eigenvectors,
7. Finite Element Method,
8. Monte Carlo Method,
9. Optimization,  
Project: one-month to finish,
10. Case studies,

- **Evaluation** 評分方式:

1. Two Homeworks, 70%;
2. One Projects, 30%.

- **Office hours** 諮詢時間:

13:30-15:30, Tuesday at Room 523, EECS bldg.

- **More information:**

<http://mx.nthu.edu.tw/~rklee>

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