UNIVERSITY OF THE PHILIPPINES

APPLIED PHYSICS 157
COMPUTATIONAL ANALYSIS AND MODELING IN PHYSICS
2nd Semester AY 2023-2024

COURSE GUIDE

I. COURSE OVERVIEW

Hands-on experience in using numerical/computational techniques for solving problems in applied physics is highlighted in this course. Topics covered include: machine learning, image processing, Monte Carlo methods, and complex network tools.

II. CLASS AND INSTRUCTOR DETAILS

Instructor (Lecture): Reinabelle Reyes (rreyes@nip.upd.edu.ph)
Instructors (Lab): Rene Principe (rprincipe@nip.upd.edu.ph), Sean Fortuna (sjfortuna@nip.upd.edu.ph)
Credit: 3 units
Section(s): THY-TX-1 and THY-TX-2
Mode: F2F
Class Schedule (Lecture): TTh 4-5:30PM
Venue (Lecture): NIP R211

Class Schedule (Lab): TTh 1-4PM
Venue (Lab): CSRC Computer Laboratory 1

Google Classroom:

Class Code: kwffni7
Link: https://classroom.google.com/c/NjU3NDkxOTU2MTcw?cjc=kwffni7
Google Drive Folder:
https://drive.google.com/drive/folders/1a1HWq2i1C015Z07_1eUamCJjxb6T14AB?usp=sharing

Please join the Google Classroom to get class announcements. Course materials will be uploaded to the Class Google Drive Folder.

III. STUDY SCHEDULE

Dates	Topic	Module Set
Feb 6	Orientation	-
Feb 8 & 13	A.1. Classification	A. Machine Learning
Feb 15 & 20	A.2. Regression	
Feb 22 & 27	A.3. Dimensionality Reduction	
Feb 29	Synthesis Session: Machine Learning	
Mar 5	Assessment: Machine Learning	
Mar 7 & 12	B.1. Digital image formation	B. Image Processing
Mar 14, 19, 21	B.2. Fourier Transform applications in image processing	
Lenten & Reading Break (Mar 25 to Apr 6)		
Apr 11	B.2. Fourier Transform applications in image processing (cont.)	B. Image Processing
Apr 16	Synthesis Session: Image Processing	
Apr 18	Assessment: Image Processing	
Apr 23, 25 & 30	C.1. Monte Carlo Methods	C. Monte Carlo Methods and Networks
May 2, 7 & 9	C.2. Networks	
May 14	Synthesis Session: Monte Carlo Methods and Networks	
May 16	Assessment: Monte Carlo Methods and Networks	
May 21 to 30	Coding Project Presentations	-

COURSE REQUIREMENTS

Your final grade will be based on the following course requirements:

- Lab Assignments: **75%**
- Lecture Assessments: **15%**
- Coding Project: **10%**