

Computational Methods in Physics (PHY4605) - Course Introduction

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Overview

This course covers numerical methods for solutions in integration, differentiation and matrix operation. The use of numerical analyses techniques in classical and quantum physics are also discussed. At the end of the course, students are expected to attain the following learning outcomes:

1. Assessing numerical methods related to physics
2. Organizing various numerical methods in solving physics problems
3. Explains the potential of computational methods for commercialization purposes

Time and Place

Activity	Day & Time	Venue
Lecture	Thursday, 9.00 - 11.00 a.m.	Computer Lab, Department of Physics
Practical	Monday, 02:00 - 05:00 p.m.	Computer Lab, Department of Physics

Lecturer



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Fields: [Seismo-electromagnetics \(earthquake precursors\)](#), [space science](#), [data science](#)

Lesson Plan

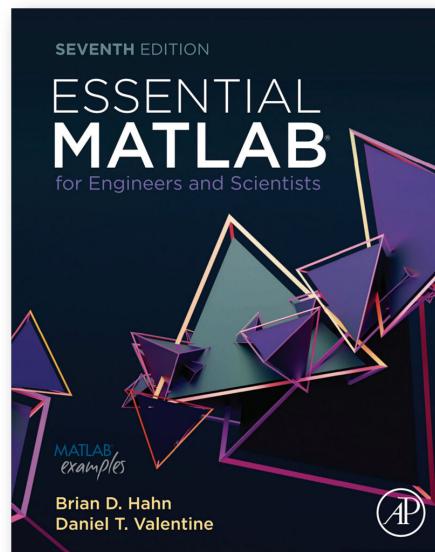
Week	Topic/Assessment
1	Programming Fundamentals
2	Arrays and Matrices
3	Data Types
4	Logic and Conditional Statements
5	Loops
6	Algorithm and Errors , Test 1
7	Functions
8	Graphics
-	Mid-semester break
9	Random Number and Simulation
10	Symbolic Mathematics , Test 2
11	Numerical Root-Finding and Calculus
12	Numerical Differential Equations
13	Data Processing , Lab Test
14	Presentation (Mini Project)
-	Study week

-	Final Exam
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Assessment

Assessment	Percentage (%)
Test 1	10
Test 2	15
Mini Project	10
Lab Assignment	20
Lab Test	5
Final Exam	40
Total	100

Reference



Learning Tools

In order to maximize the learning experience of this course, you are required to have an access to **MATLAB** software during both lecture and laboratory sessions. The following are steps to obtain a MATLAB campus-wide license:

1. Go to this [address](#) to create a MathWorks account using your **student's email address**.

Then, you can opt for either of the following to access MATLAB:

A. MATLAB Desktop

Requires a medium-specification, i.e., Intel i5 or AMD Ryzen 5 and 8 GB RAM computer or higher.

1. After signing in the account, go to [License Center](#). Select the "MATLAB (Individual)" license and start the software downloading process.
2. During installation, make sure you select the following products to be installed: MATLAB, Symbolic Math Toolbox, Statistics and Machine Learning Toolbox, Text Analytics Toolbox and Parallel Computing Toolbox. Other products are optional.

B. MATLAB Online

Requires Internet browser and stable Internet connection.

1. After signing in the account, go to [MATLAB Online](#).

Self-Paced Learning

To familiarize yourself with MATLAB programming language and environment, complete a self-paced course called [MATLAB Onramp](#). Note that you must sign in your MathWorks account to access the course.



Course Completion Certificate

Khairul Adib Yusof

has successfully completed **100%** of the self-paced training course

MATLAB Onramp


DIRECTOR, TRAINING SERVICES

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