Software for Mathematicians
SM-2302

Dr Huda Ramli
Mathematical Sciences, Faculty of Science, UBD
huda.ramli@ubd.edu.bn

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Welcome to SM-2302

Mathematical software is what bridges higher mathematics to real world applications. On completing this module, students should be able to use `MATLAB` and `R` to effectively implement mathematical solutions to real world problems. They should also be able to produce publication-quality mathematical documents using LATEX. This module provides the computing skills required for an applied mathematics final year project.

Module content

1. Introduction to the `MATLAB` and `R` languages.
2. Programming using `MATLAB` and `R`.
3. Preparing documents using LATEX.
4. Version control using Git and GitHub.

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Assessment: **100% coursework**

1. Four online quizzes (20%)
2. Two mini individual assignments (20%)
3. Two mini group assisgnments (30%)
4. One project assignment with written report (30%)

Weekly contact hours

- <u>Lectures</u>: 2 hours in computer lab on Thursdays 7:50 AM
- <u>Tutorials</u>: 2 hours practice lab on Saturdays 2:10 PM

See full schedule in the SM-2302 Syllabus document.

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MATLAB

- `MATLAB` is a high-level language and interactive environment for numerical computation, visualization and programming.
  - Analyze data
  - Develop algorithms
  - Create models and applications
- We will reinforce some calculus concepts and its applications using `MATLAB`, such as
  - Numerical differentiation
  - Numerical Integration
  - Root-finding methods

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Software

`MATLAB` is installed in the campus computer labs. However, if you wish to work from home or on your laptop, you can either

1. use `MATLAB` Online on your web browser; or
2. install `MATLAB` on your personal computer.

MATLAB Campus-wide suite

To install or use `MATLAB` on your web browser, you need to create a Mathworks account using your UBD e-mail. You can access the UBD campus-wide suite using your mathworks account.
Please refer to the `MATLAB` individual CWL installation guide document.

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MATLAB Online

https://matlab.mathworks.com

MATLAB Graphical Interface

- Command window
- Workspace
- Current folder
- Command history
- Editor