Universiti Malaysia PAHANG
Engineering • Technology • Creativity

NUMERICAL METHODS & OPTIMISATION

Project I

Raihana Edros
Faculty of Engineering Technology
rzahirah@ump.edu.my

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Chapter Description

- Aims
  - Apply numerical methods in solving engineering problem and optimisation
  - Defend ideas to solve the engineering problems using numerical methods

- Expected Outcomes
  - Propose an engineering problem from different engineering field
  - Select the best numerical method to solve the problem
  - Defend the numerical solution of the engineering problem

- References
  - Steven C. Chapra and Raymond P. Canale (2009), Numerical Methods for Engineers, McGraw-Hill, 6th Edition

Project Milestone

- Week 9   : Distribution of Project Guidelines and selection of Problem (Part 1)

- Week 10   : Presentation 1

- Week 11-14   : Problem solving using manual calculation & MATLAB (Programming)

- Week 15   : Presentation 2 & Submission of Part 1 and 2

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Part I: Selection of Problems (25 marks)

- Each group should decide the methods in KALAM by Week 5
  - Chapter 4: Golden Section Search, Quadratic Interpolation, Newton's Method
  - Chapter 5: Linear Regression, Polynomial Regression, Langrange Interpolating Polynomials, Spline Interpolation

- Only two groups are allowed for each Method

- Students are expected to provide the following details in the project:
  - Detailed description about the problem to be solved (15 marks)
    - Marks are given based on the complexity of the problem. More marks will be given for more complex problem.
  - The application of MATLAB in solving the problem (10 marks)
    - Flow chart must be used to visualize the plan of problem solution

Part 2: Supervision (5 marks)

- Each group should spend minimum of 1 hour with the course instructor from Week 6 – Week 9.

- This will carry a total of 5 marks.

- The meeting could be done in stepwise manner,
  - e.g. 20 mins every meeting, for 3 times or 2 times of 30 mins meeting, depending on the needs of students to seek advice from the course instructor.

Date	Duration	Marks	Instructor's signature

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Part 3: Presentation (10 marks)

- Students would have to present Part 1 to the class in Week 6.
- This will carry 10 of total marks.

Main Reference

Steven C. Chapra and Raymond P. Canale (2009), Numerical Methods for Engineers, McGraw-Hill, 6th Edition

Any enquiries kindly contact:
Raihana Edros, PhD
rzahirah@ump.edu.my

Project I
By Raihana Edros
http://ocw.ump.edu.my/course/view.php?id=608&notifyeditingon=1

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