CM 1606 Computational Mathematics

Overview

Ganesha Thondilege

ROBERT GORDON UNIVERSITY ABERDEEN   TEF Gold   INFORMATICS INSTITUTE OF TECHNOLOGY

Learning Outcomes

- On completion of this module, students are expected to be able to:

  - Demonstrate the knowledge associated with mathematical theorems for AI and DS related problems

  - Formulate loss/cost/objective functions and critically analyze their min/max properties

  - Apply a range of statistical distribution models and hypothesis testing to real-world problems

  - Represent, analyze and visualize data, in order to infer helpful insights about data collections.

MODULE DETAILS

- Full Module Title: Computational Mathematics

- Module Code : CM 1606

- Length : 2 Semesters

- Lecturers

  Module Leader

  - Ganesha Thondilege(ganesha.t@iit.ac.lk)

  Module Team members:

  Ms. Nipuni Perera (nipuni.p@iit.ac.lk)

  Prof. Nimal Wickramasinghe(nimal.w@iit.ac.lk)

ASSESSMENT PLAN

- Examination – 40% - 1st semester

- Individual Coursework – 60% - 2nd Semester

- Module mark – Overall minimum grade D

MODULE DELIVERY

- This is a year long module

- Lectures
  - 2 hours per week

- Tutorials
  - 2 hours per week

MODULE CONTENT – 1st Semester

- Set Theory

- Relations and Functions

- Logic, Propositional Logic

- Logarithm

- Modular Arithmetic

- Matrices

- Vectors

- Tensor Operations

- Probability

MODULE CONTENT – 2nd Semester

- Probability Distributions – Discrete and Continuous

- Inferential Statistics – Estimators, Estimates and Confidence Intervals

- Hypothesis Testing

- Sampling Techniques

- Regression Analysis – ANOVA

- R Studio

ESSENTAIL READING

- K.A. Stroud, Booth, D. (2009) Foundation Mathematics, Palgrave MacMillan.

- Bruce, A., Bruce, P. , Gedeck, P. (2020) Practical Statistics for Data Scientists. O'Reilly

- Grossman, P., (2008) Discrete Mathematics for Computing. Palgrave MacMillan.

- Strang, G. (2016). Introduction to Linear Algebra, Fifth Edition, Wellesley - Cambridge Press, 2016.

- Lipschutz, S. (1998) Schaum's outline of set theory and related topics. 2nd ed. McGraw-Hill Education

- [RGU Reading List](RGU%20Reading%20List)