CPCS-212 Syllabus

Catalog Description

CPCS-212 Applied Math for Computing (I)
Credit: 4 (Theory: 3, Lab: 0, Practical: 2)
Prerequisite: MATH-202
Classification: Department Required

The objective of this course is to familiarize students with the basic concepts of applied mathematics used in computer science. Topics include: Matlab: matrices and arrays, Matlab: graphics, Matlab: programming, solution of nonlinear equations, solution of systems of linear equations, numerical integration, numerical differentiation, and ordinary differential equations.

Class Schedule

Lab/Tutorial 90 minutes 1 times/week

Meet 50 minutes 3 times/week or 80 minutes 2 times/week

Textbook

Curtis F. Gerald, Patrick O. Wheatley, , "Applied Numerical Analysis", Addison-Wesley; 7 edition (2004)

ISBN-13 9780321133045 **ISBN-10** 0321133048

Grade Distribution

Week	Assessment	Grade %
4	Homework Assignments 1	2
7	Quiz 1	2
8	Exam 1	10
11	Homework Assignments 2	3
12	Exam 2	15
13	Quiz 2	3
14	Project (Individual)	15
15	Lab Exam	20
16	Exam	30

Topics Coverage Durations

Topics	Weeks
Matlab: Matrices and Arrays	1
Matlab: Graphics	1
Matlab: Programming	2
Solution of Nonlinear Equations	3
Solution of Systems of Linear Equations	2
Interpolation and curve fitting	1
Numerical Integration	1
Numerical Differentiation	1
Ordinary Differential Equations	3

Last Articulated

October 23, 2017

Relationship to Student Outcomes

a	b	c	d	e	f	g	h	i	j	k
x								x	x	

Course Learning Outcomes (CLO)

By completion of the course the students should be able to

1. Recognize basic data structures in Matlab. (a)
2. Recognize basic matrix mathematics in Matlab. (a)
3. State techniques for plotting data in Matlab. (i)
4. State programming fundamentals in Matlab (i)
5. **Calculate the roots using the idea of a numerical method (Bisection method, Newton method, Secant method) to locate roots of an algebraic equation. (a)**
6. Apply a numerical method (Bisection method, Newton method, Secant method) to locate roots of an algebraic equation. (j)
7. Produce a program for a numerical method (Gaussian elimination method, Gaussian elimination with scaled partial pivoting method) to solve a system of linear equations in Matlab (i)
8. Apply a numerical method (Gaussian elimination method, Gaussian elimination with scaled partial pivoting method) to solve a system of linear equations. (j)
9. **Produce a program for a numerical method (Bisection method, Newton method, Secant method) to roots of an algebraic equation in Matlab. (i)**
10. Apply a numerical method (Direct Interpolation And Least Square Regression) to interpolate or curve fit discrete points (j)
11. **Apply a numerical method (Upper and lower sums, Newton-Cotes methods) to find the numerical integration of a function. (j)**
12. Produce a program for a numerical method (Upper and lower sums, Newton-Cotes methods) to find the numerical integration of a function in Matlab. (i)
13. Apply a numerical method (difference method) to find the numerical differentiation of a function. (j)
14. **Produce a program for a numerical method (difference method) to find the numerical differentiation of a function. (i)**
15. **Apply a numerical method (Euler method, Runge- Kutta method) to solve a differential equation. (j)**
16. Produce a program for a numerical method (Euler method, Runge-Kutta method) to solve a differential equation in Matlab. (i)

CPCS-212 Syllabus

Coordinator(s)

Prof. Vijey Thayananthan, Professor
Dr. Etimad Fadel, Associate Professor