**Course Outline, Spring 2019**

**CSE 330: Numerical Methods**

**Faculty: Ismail Hossain (ISH)**

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**Overview:** To solve mathemetical equations analytically, you may use your experiences in the calculus courses you have studied so far but, in most cases, the equations need to be solved approximately using numerical methods. Numerical computations play an indispensable role in solving real life mathematical, physical and engineering problems.Great mathematicians like Gauss, Newton, Langrange, Fourier and many others in the eighteen and nineteeth centuries developed numerical techniques which are still being used. The advent of computers has, however, enhanced the speed and accuracy of numerical computations.

**Tentative Lecture Topics:**

**# Lecture 1: Introduction**

**# Lecture 2: Finding Root-Bisection Method**

**# Lecture 3: Finding Root-Newton’s Method**

**# Lecture 4: CT-1 & Finding Root-Secant and False Position Method**

**# Lecture 5: Practice on L-2, L-3 & L-4**

**# Lecture 6: Interpolation-Direct and Langrange’s Method**

**# Lecture 7: Interpolation-Newton’s Divided Difference Method**

**# Lecture 8: CT-2 & Interpolation-Spline Method**

**# Lecture 9: Regression Analysis**

**# Lecture 10: Practice on L-6, L-7, L-8 & L-9**

**# Lecture 11: Mid Term Examination + SSLE-Gaussian Elimination**

**# Lecture 12: SSLE- Gauss Seidel Method & LU decomposition**

**# Lecture 13: CT-3 & Practice on L-11 & L-12**

**# Lecture 14: Numerical Differentiation**

**# Lecture 15: Numerical Integration-1**

**# Lecture 16: CT-4& Numerical Integration-2**

**# Lecture 17: Practice on L-14, L-15 & L-16**

**# Lecture 18: Ordinary Differential Equation-1**

**# Lecture 19: Ordinary Differential Equation-2**

**# Lecture 20: Practice on L-18 & L-19**

**\*\*\* No makeup quizzes**

***The Lecture Presentations will be available in TSR under either of the following folders***

***//tsr/ summer/CSE/ACH/CSE330/***

**Reference:**

* **Numerical Methods with Applications: http://mathforcollege.com/nm/topics/textbook\_index.html**

**Marks Distribution (tentative):**

|  |  |
| --- | --- |
| **Category** | **Percentage** |
| **Quiz+Attn** | **20%** |
| **Midterm** | **20%** |
| **Final Exam** | **40%** |
| **Lab** | **20%** |
| **Total** | **100%** |

**Grading System:   
The grades for the program will be indicated in the following manner:**

**90 - 100 = A (4.0) Excellent  
85 - <90 = A- (3.7)   
80 - <85 = B+ (3.3)   
75 - <80 = B (3.0) Good  
70 - <75 = B- (2.7)   
65 - <70 = C+ (2.3)   
60 - <65 = C (2.0) Fair  
57 - <60 = C- (1.7)   
55 - <57 = D+ (1.3)   
52 - <55 = D (1.0) Poor  
50 - <52 = D- (0.7)   
<50 -- -- = F (0.0) Failure**

**Good Luck**