Ambedkar University Delhi

Course Outline

Monsoon Semester (July-December 2018)

School: Undergraduate Studies

Programme with title: BA (Honours)

Semester to which offered: (I/ III/ V) III semester

Course Title: Numerical Analysis

Credits: 4 Credits

Course Code (new): SUS1MA504

Course Code (old): M05

Type of Course:	Compulsory	yes	Cohort	BA (H) Mathematics
	Elective	yes	Cohort	BA (H) other than Mathematics

For SUS only (Mark an X for as many as appropriate):

1. Foundation (Compulsory)
2. Foundation (Elective)
3. Discipline (Compulsory)   X
4. Discipline (Elective)   X
5. Elective

Course Coordinator and Team: Pranay Goswami (CC) and Kranti Kumar

Email of course coordinator: pranay@aud.ac.in

Pre-requisites: Mathematics of the 10 + 2 level

Aim: This course deals with the techniques of numerical analysis, which gives the solution to applied problems when ordinary analytical methods fail. There is also emphasis is on computer programming so that the numerical techniques can be used in design of and solving problems. The course is divided into two parts.

The First part is essentially theoretical. This contains topics pertaining to numerical analysis, numerical differentiation and integration, solution of linear equations etc.

The second part will consist of Lab work, where we will implement all theoretical aspects of numerical analysis into Lab work. Students will also be taught C++ programming with the aim of implementing the routines developed in the theory part of Numerical Analysis.

Brief description of modules/ Main modules:

Theory

1. The Language of Numerical Analysis
2. Solution of Algebraic and Transcendental Equations
3. Interpolation
4. Numerical Differentiation and Integration
5. System of Linear Equations

LAB MODULES:

1. C++ Programming basics
2. Data types
3. Data input and Library files
4. Loops and decisions
5. Arrays
6. Functions
7. An Introduction to programming styles
8. Programming Methods of Numerical Analysis

Refererences:

MAIN REFERENCES:

1. *Numerical Analysis, 7th Edition* by Richard L Burden and J Douglas Faires, Cengage Learning, India Edition, ISBN 9788131501375

2. *The Object- Oriented Programming in C++,* 4th Edition, Pearson Education, Indian Edition

Additional References

1. *C++: The Complete Reference,* H. Shildt, 4th Edition, McGraw Hill Publication, Indian Edition.

2. *The first book of C++,* G. Bronson, 4th Edition, Cengage Learning, Indian Edition.

3. N*umerical Mathematics and Computing*, 6th Edition. By Ward Cheney and David
   Kincaid, Brooks/Cole: Cengage Learning (c) 2008.

Tentative Assessment schedule with details of weightage:

S.No	Assessment	Date/period in which Assessment will take place	Weightage
1	Class test	End August	10%
2	Mid Semester Exam	End September/ early October	20%
4	Presentation/ Project	End October/ early November	20%
5	End Semester Exam	As per AUD Academic Calendar	30%
6	Lab Test	Early November	20%