



AGHOREKAMINI PRAKASHCHANDRA MAHAVIDYALAYA



ADD ON COURSE ON

Basics on Mathematica Software

ORGANIZED BY

DEPARTMENT OF MATHEMATICS

IN ASSOCIATION WITH

**IQAC, AGHOREKAMINI PRAKASHCHANDRA  
MAHAVIDYALAYA**

**COURSE TITLE:** Basics on Mathematica Software

**COURSE DURATION:** 36 HOURS (FROM 16.11.2021- 07.12.2021)

**COURSE OFFERED BY:** Dept. of **Mathematics**,  
A.K.P.C Mahavidyalaya  
Bengai, Hooghly

**PARTICIPATING TEACHERS:**

1. DR. SOURAV HALDER (Assistant Professor)
2. KUNTAL MUKHERJEE (SACT)
3. HIRANMOY MAITI (SACT)

**COURSE COORDINATOR:** Hiranmoy Maiti

(9088978309)

## **SYLLABUS:**

What is Mathematica? The structure of Mathematica, Notebook interfaces, editing Cells and Text, Palettes. Mathematica as a Calculator: Basic Arithmetic, precedence, Built-in Constants: Built-in functions. Numerical Notation: prefix, postfix, infix forms for Built-in functions, Mathematica help. Variables and functions: Rules for Names, immediate Assignment, functions, substitution rule, anonymous functions. Lists: what is a list? Functions producing lists, working with elements of list, listable functions, useful functions. Solving equations: equations and their solutions, inequalities, single variable Calculus: function domain and range, limits, differentiation, implicit differentiation, Maximum and minimum, integration. Sums and products: sequences, the sum command, Vectors and matrices: vectors, Matrices, the conditional function if. Special types of matrices. Basic matrix operations, solving linear systems. Ordinary Differential Equations: Analytic Solutions of an ODE. Equations with Initial or Boundary Conditions. Numerical Solutions of ODEs.

## **MODULES:**

### **UNIT- 1**

Introduction in Mathematical Software. What is difference between symbolic and numerical calculation? (1 h. lecture, 1 h. practical)

### **UNIT- 2**

Introduction in Wolfram Language. (4 h. lecture, 4 h. practical)

### **UNIT- 3**

Basic mathematical problems solving by using Wolfram Mathematica.

(4 h. lecture, 5 h. practical)

## UNIT- 4

Advanced using Wolfram Mathematica.

(3 h. lecture, 4 h. practical)

## UNIT- 5

The study of applied mathematics models with the computer technologies.

(4 h. lecture, 6 h. practical)

### PROGRAMME OUTCOME:

THE STUDENT MUST DEMONSTRATE THE ABILITY TO SOLVE SET TASKS USING WOLFRAM MATHEMATICA SOFTWARE. HE MUST BE ABLE TO EVALUATE AND CORRECTLY INTERPRET THE RESULTS HE OBTAINED, AND ALSO UNDERSTAND THE BASIC PRINCIPLES OF THE ALGORITHMS ON WHICH THE FUNCTIONS OF WOLFRAM MATHEMATICA ARE BASED. HE ALSO ABLE SOLVE VARIOUS TYPES OF MATHEMATICAL MODELING.

### COURSE OUTCOME:

CO -1 : STUDENT MUST KNOW THE MAIN MATHEMATICAL SOFTWARE AND SPECIALIZED PACKAGES OF PROGRAMS DESIGNED TO SOLVE APPLIED MATHEMATICAL PROBLEMS, BASIC COMPUTER TECHNOLOGIES FOR MATHEMATICAL RESEARCH AND CRITERIAS FOR EVALUATING THE EFFECTIVENESS OF USING VARIOUS ALGORITHMS, MEDTHODS AND COMPUTER TECHNOLOGIES.

CO -2 : STUDENT MUST KNOW HOW TO CHOOSE SOFTWARE TOOLS AND PROFESSIONALLY USE COMPUTERS FOR SOLUTION OF APPLIED PROBLEMS.

CO 3 : IT WILL BE POSSIBLE TO KNOW WHAT IS THE APLICATIONS OF X-RAY IN RADIOLOGY.

CO 4 : STUDENT MUST OWN THE SKILLS OF FINDING ADEQUATE AND EFFECTIVE WAYS

## OF SOLVING MATHEMATICAL PROBLEMS WITH USING COMPUTER TECHNOLOGY.

### MODE OF EVALUATION:

After the completion of course, written examination will be taken for 80 Marks and a viva will be conducted for 20 Marks. On the basis of marks obtained for written examination and viva, the results will be prepared. The gradation system for the declaration of results will be as follows:

#### Grading system

Level	Excellent	Very Good	Good	Above Average	Average	Below Average	Poor	Fail
Grade	A+	A	B+	B	C	D	E	F
Marks range	90-100	80-89	70-79	60-69	50-59	40-49	33-40	0-32