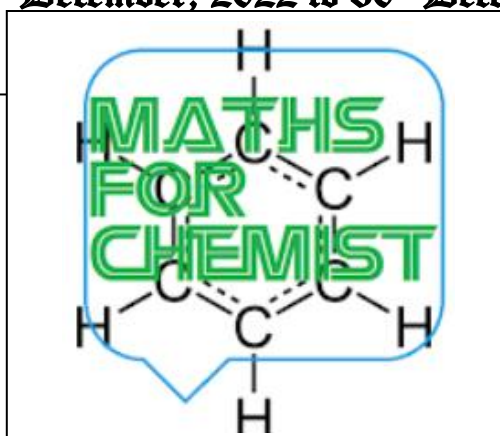# Government General Degree College, Muragachha
Department of Chemistry

offers 30 hours certificate course
on
Essential Mathematics for Chemistry

[From 26th December, 2022 to 30th December, 2022]

SCHEDULE

Date	10:00 am – 12:00 pm	12:00 pm – 02:00 pm	02:30 pm – 4:30 pm
26-12-2019	Mr. Rajib Mondal	Dr. Raudra Tapas Dey	Dr. Rajib Sarkar
27-12-2019	Dr. Rajib Sarkar	Dr. Raudra Tapas Dey	Mr. Rajib Mondal
28-12-2019	Dr. Raudra Tapas Dey	Mr. Rajib Mondal	Mr. Prabir Chakraborty
29-12-2019	Mr. Rajib Mondal	Mr. Prabir Chakraborty	Dr. Raudra Tapas Dey
30-12-2019	Dr. Rajib Sarkar	Mr. Prabir Chakraborty	Mr. Rajib Mondal

ALL THE CLASSES WILL BE HELD IN SEMINAR-II

Notice No.- MGC/CHEM –05/2019   Date 18|12|2019

NOTICE

It is hereby notified for all concerned that the course conducted by Department of Chemistry on **"Essential Mathematics for Chemistry"** will commence from 26-12-2019 to 30-12-2019. Interested students may enroll their names to Mr. Rajib Mondal, the co-ordinator of the course. Syllabus of the course and routine will be announced in due time.

Officer-in-Charge
Government General Degree College, Muragachha
Muragachha, Nadia-741154, W.B

Officer-in-Charge
Govt. General Degree College Muragachha
Muragacha Nakashipara Nadia

18|12|2019
Head
Department of Chemistry
Government General Degree College,
Muragachha
Muragachha, Nadia-741154, W.B.

Govt. of West Bengal
Office of the Principal
Department of Chemistry
Government General Degree College, Nakashipara
Muragachha, Nadia, Pin – 741154
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Ref. No ……………………   Date : …………………….…

Value Added Course

Course Title: Essential Mathematics for Chemistry
Course Duration: 30 hours (30 L)
Course Objective
- To develop mathematical maturity for the students of chemical sciences.
- To gain exposure to basic mathematics necessary to learn chemistry at UG/college level.
- To gain deeper insight into the core concepts of chemical sciences, mostly physical chemistry..

Course Structure
The course has been divided into five modules as follows.

Module 1: **Preliminaries (6 L)**
General introduction to computers, different components of a computer, hardware and software, input and output devices, binary numbers and arithmetic. Introduction to computer languages, programming and operating systems. Introduction to word processing, plotting and chemical drawing softwares. MS Office, Origin, Chemdraw,
Basic coordinate geometry - 2D and 3D. Rectangular and polar coordinates. Different forms of the equation of a straight line. Polynomial, exponential, logarithmic, trigonometric functions. Plotting graphs of simple linear and nonlinear functions.

Module2: **Mathematical functions and their differentiation (6 L)**
Mathematical functions. Normal distribution function, Error function, Gamma function, Dirac delta function
Differential calculus: limit, basic rules of differentiation, The tangent line and the derivative of a function, maxima and minima. Partial differentiation, exact and inexact differential, Taylor and McLaurin series, Fourier series.
Numerical differentiation (e.g., change in pressure for small change in volume of a van der Waals gas, potentiometric titrations)

Module 3: **Integration and Differential equations (6 L)**
Rules of integration, definite and indefinite integrals. Simple integration techniques. method of substitution. Integration by parts. numerical integration, Trapezoidal and Simpson's rule (e.g. entropy/enthalpy change from heat capacity data).
Differential equations: Separation of variables, homogeneous, exact, linear equations, equations of second order, series solution method

Module 4: **Polynomials, Probability and Statistics (8 L)**
Numerical methods of finding roots by different methods e.g. binary-bisection method, method of successive approximations, Newton-Raphson method. Iterative solutions of cubic equations. pH of a weak acid not ignoring the ionization of water, volume of a van der Waals gas
Probability : Permutations, combinations and theory of probability, Stirling's approximation, most probable distribution. Sampling, evaluation of analytical data, errors, accuracy and precision, methods of their expression, normal law of distribution if indeterminate errors, statistical test of data; F, Q and t-test, rejection of data, and confidence intervals.

Module 5: **Linear Algebra (4 L)**
Vectors, matrices and determinants, dot, cross and triple products, introduction to matrix algebra, addition and multiplication of matrices, inverse, adjoint and transpose of matrices, unit and diagonal matrices. Eigenvalue and eigenvector. Solution of linear homogeneous simultaneous equations.

Conclusion:
Upon the completion of the course the students will have better mathematical maturity to study and understand chemical sciences.

Officer-in-Charge
Govt. General Degree College, Nakashipara
Muragachha, Nadia

Ref. No ………………………   Date: …………………………….

Course Outcome:

After completing the course the students will have a better understanding of the basic mathematical knowledge required to study chemical physics at the undergraduate level. Special emphasis is given to the necessary, but often overlooked areas, in the regular courses of mathematics in our university syllabus, so these add on course is expected to complement the traditional mathematical courses.