P R Thakur Government College
Department of Mathematics
Course outcome for **B. Sc. (Hons)** Mathematics

At present two types of courses are running simultaneously --- CBCS system and NEP-2020 system. The NEP system has multiple exit for which each year's outcome should be mentioned separately.

Course outcome for CBCS system:

The following courses are taught as core courses:

- Algebra (Classical, Abstract and Linear)
- Real Analysis
- Analytical Geometry
- Differential Equation (both ordinary and partial)
- Multivariate Analysis
- Numerical Analysis
- Metric Spaces
- Complex Analysis

Besides these, two SECs (skill enhancement course) are also taught:

- C programming Language
- Set theory and Logic

The course has been designed to make a good foundation of Mathematics with an elementary knowledge of Computer Programming and Mathematical Logic. In addition to these courses, in the last two semesters, the following six DSE (discipline specific elective) courses are offered from which a student takes four courses:

- Linear Programming
- Number Theory
- Probability & Statistics
- Theory of Equations
- Boolean Algebra and Automata Theory
- Mechanics

A student takes any two from the first three and any two from the last three. The students can choose the subjects according to their future plan.

After completion of this course a student can move for higher education for the following programs:

- M. Sc. In Mathematics (either Pure Mathematics or Applied Mathematics or Mixed)
- M. Sc. In Statistics
- M. Stat programme
- M. Sc. in Theoretical Computer Science (in some universities)
- M. Sc. in Computational Mathematics
- MCA
- MBA
- Various courses in Data Analytics

In the job market, besides the regular Government services and Teaching jobs a Mathematics Honours graduate has the opportunity in many computer oriented jobs, specially in market survey, data analytics and trading strategies.

The NEP 2020 (National Education Policy 2020) course:

In the year 2023 the CBCS course has been discontinued and the National Education Policy Course was introduced in this institution by the affiliating University. Duration of this course is four years and offers multiple exit so that a student, if leaves in the midways, gets some affiliation according to his period of his study and will no longer be treated as “drop out”. The course is described below:

1. **NEP Year 1:**

   In the first two semesters a student has been taught the two major courses (i) Algebra and Number Theory and (ii) Calculus with Applications. Besides these, two SEC courses are also offered: (I) C Programming Language and (ii) Python Programming Language. The other courses are two Minor courses of their choice, a Multidisciplinary course, MIL (Modern Indian Language) and VAC (value added course) on Yoga.

   After first year a student acquires basic knowledge of Algebra and Calculus, also develops skill on computer programming with C and Python languages which helps him to get a computer oriented job. A student exits after successful completion of first year will be eligible to get certificate.

2. **NEP Year 2:**

   In the third semester (second year first half) a student has been taught a major course on Geometry and Vector Analysis along with two Minor courses and a multidisciplinary course of his choice. In the fourth semester (second year second half) there are only four Major courses (i) Ordinary Differential Equations-I (ODE-I) and Mechanics (ii) Real Analysis-I (iii) Group Theory-I and Number Theory (iv) Partial Differential Equations (PDE) and Integral Transform.

   A student exits after successful completion of second year will be eligible to get diploma.

3. **NEP Year 3:**

   In the third year each semester contains four major courses. In semester 5 the students have to go through the courses on (i) Real Analysis-II (ii) Ring Theory and Linear Algebra-I, (iii) Numerical Analysis (Theory and Practical) and (iv) Multivariate Calculus and Metric Space. In semester 6 the subjects of learning are (i) Operations Research and Game Theory (ii) Group Theory-II and ODE-II (iii) Probability & Statistics and (iv) Complex Analysis.

   After completion of three years of the course a student will have a good foundation in Higher Mathematics along with skills in Computational Mathematics, Optimization Theory, Statistics. A students exits at this level will get degree in Mathematics Major. With this qualification a student may go for higher studies in Mathematics, Statistics, Computer Science, Computer Application, Data Analytics, Environmental Studies, Meteorological Science, Business Administration, Market Analysis and many more branches of science or may get a job in the related fields.

4. **NEP Year 4:**

   The year 4 has two options either (i) Honours or (ii) Honours with Research. In semester 7 there are two major courses (i) Topology and (ii) Field Extension and Linear Algebra-II. Besides these there are two minor courses of their choice from other disciplines.

   In semester 8 if a student opts for Honours, he will have to go through the major courses (i) Functional Analysis (ii) Mechanics-II (iii) Discrete Mathematics and Differential Geometry (iv) Data Science. If a student opts for Honours with research, he will have to pursue a Research Project / Dissertation guided by a faculty member of the department.

   After successful completion of the course a student will be awarded a degree of Honours or Honours with Research according to the scheme he opted for. The design of the course year 4 is intended towards higher study in Mathematics or any related subject.