Haldia Government College

(Affiliated to Vidyasagar University)

Bachelor of Science

Multidisciplinary Studies

3-Year Undergraduate Programme

Based on

Curriculum & Credit Framework for Undergraduate Programme (CCFUP) 2023

& NEP 2020

Programme Specific Outcome (PSO)

&

Course Outcome (CO)

Programme: Bachelor of Science with Chemistry (Physical Science/ Life Science)

Programme Specific Outcome (PSO)

1. Students will be entirely equipped with the knowledge of all the branches of Chemistry such as physical, inorganic, organic & analytical chemistry.

2. Students will acquire the ability to analyse and explain chemical phenomena with the basic principles and fundamentals and to write it concisely.

3. Students will learn to analyse in organic and organic samples qualitatively and in some cases quantitatively.

4. Students will gain expertise to set up an experiment (estimation or synthesis of a compound) and work up.

5. Students will be enriched with the knowledge and training to operate many physico-chemical instruments and to carry out experiments therein.

6. Students will be able to interpret IR and NMR spectra of organic compounds.

7. Students will attain the ability to work individually or in a group following a systematic plan.

8. Introduction of Computer under CBCS at the UG level will upgrade the Quality of Education of the students.

9. Students will achieve the confidence to prepare and defend a scientific presentation in their individual capacity.

Course Outcome (CO)

1. *Semester I*
   Course name: Minor
   Paper: Atomic Structure, Acids and Bases, Redox Reactions & States of Matter
   Course code: CEMPMI01
   Credit: 4 [Theory 3, Practical 1]
   Marks: 75

   In this course, students will gain knowledge of Atomic Structure, Acids and Bases, Redox Reactions & States of Matter. Understanding atomic structure and states of matter is one of the corner stone of learning chemistry. Lesson on redox, precipitation reactions etc will enlighten the students about various chemical reactions they come across in their daily life as well as taking place in numerous natural phenomena.
   In practical classes, students will get a clear understanding about the organic reactions, redox reactions etc by undergoing hands-on training.

2. *Semester I*
   Course name: SEC
   Paper: Chemistry of Cosmetics and Perfumes
   Course code: SEC01
   Credit: 3 [Practical]
   Marks: 50

In this skill-based paper which is purely practical, students will get hands-on training regarding how to synthesize cosmetic items like talcum powder, shampoo, nail polish, hair remover, face cream etc. Through this training, not only their skill will increase but they will also understand the amount of chemicals they are using while using cosmetic items.

3. *Semester II*
   Course name: Major
   Paper: Atomic Structure, Redox Reactions and precipitation reactions, general organic chemistry & aliphatic hydrocarbons
   Course code: CEMPMJ102
   Credit: 4 [Theory 3, Practical 1]
   Marks: 75

   In this course, students will gain knowledge of Atomic Structure, Redox Reactions and precipitation reactions, general organic chemistry & aliphatic hydrocarbons. Understanding atomic structure is one of the corner stone of learning chemistry. Lesson on redox, precipitation reactions etc will enlighten the students about various chemical reactions they come across in their daily life as well as taking place in numerous natural phenomena.
   In practical classes, students will get a clear understanding about the organic reactions, redox reactions etc by undergoing hands-on training.

4. *Semester II*
   Course name: SEC
   Paper: Medicinal & Pharmaceutical Chemistry
   Course code: SEC02
   Credit: 3 [Practical]
   Marks: 50

   The students will receive hands-on skill training about how to extract caffeine from coffee, nicotine from tobacco, curumin from turmeric etc. There is also a project where they are required to describe 10 medicinal herbal plants. After completion of this course, they will have the basic expertise about how to use herbal plants in treatment plans.

Programme: Bachelor of Science with Mathematics (Computer Science with Mathematics)

Programme Specific Outcome (PSO)

1. Ability to acquire working knowledge of algebra, calculus, geometry, differential equations and several other branches of mathematics. This also leads to study of related areas like Statistics, computer science, physical science and Chemistry. Thus, this Program helps learners in building a technical knowledge for application of basic higher mathematics in different areas of study.
2. The skills and knowledge gained has intrinsic beauty, which also leads to proficiency in analytical reasoning. This can be utilized in modelling and solving real life problems.
3. To recognize patterns and to distinguish between essential and irrelevant aspects of problems.

Course Outcome (CO)

1. *Semester I*
   Course name: Minor
   Paper: Calculus, Geometry & Ordinary Differential Equation
   Course code: CEMPMI01
   Credit: 4 [Theory 4]
   Marks: 75

   In this course, students will gain knowledge about
   a) Application of calculus in various fields of study
   b) How geometry explains a major part of our universe and how to put it to proper use in myriad aspects of daily life
   c) How in many aspects of science and technology, ordinary differential equations play central role.
   d) Students will gain the confidence of solving problems related to geometry, calculus and ODE at the end of the course.

2. *Semester I*
   Course name: SEC
   Paper: MATLAB-1
   Course code: SEC01
   Credit: 3 [Practical]
   Marks: 50

   In this skill-based paper which is purely practical, students will get hands-on training regarding: MATLAB interface, data types, variables, Flow control statements, arrays: creating, indexing, operations, Matrix creating, indexing, operations, Input and output function, Mathematical library functions, user-defined function: anonymous function.

3. *Semester II*
   Course name: Major
   Paper: Calculus, Geometry & Ordinary Differential Equation
   Course code: MATPMJ102
   Credit: 4 [Theory 4]
   Marks: 75

   In this course, students will gain knowledge about
   a) Application of calculus in various fields of study
   b) How geometry explains a major part of our universe and how to put it to proper use in myriad aspects of daily life
   c) How in many aspects of science and technology, ordinary differential equations play central role.
   d) Students will gain the confidence of solving problems related to geometry, calculus and ODE at the end of the course.

4. *Semester II*
   Course name: SEC
   Paper: MATLAB-2
   Course code: SEC02

Credit: 3 [Practical]
Marks: 50

After completion of this course, students will be able to perform tasks like the following using MATLAB:

1. Fitting a curve for given data.
2. Plotting of given data: Graph plotting, multiple plots, matrix plots, polar plots, 3D plotting (line, surface, mesh, and contour) of three-dimensional data.
3. Obtaining surface of revolution of curves.
4. Find the sum, product, max, min, sort of a list of number in an array, in a sub-array using library function.
5. Find the column sum, product, max, min, sort of the given matrix using library function.

Programme: Bachelor of Science with Physics (Physical Science)

Programme Specific Outcome (PSO)

1. Students will learn the skills to solve problems. The Problem-solving habit really helps the students to test their own theoretical knowledge as they have apply those in realistic situations.
2. Students will develop a realistic outlook towards nature upto certain limitations.
3. In these consecutive four years, they will learn realistic events like why cricket ball spins in a certain way, why earth behaves like a magnet, how computer memory works, how does a mobile phone work etc. Thus, they will learn about the nature from the deepest possible human knowledge.
4. Good knowledge in computer coding will really help them to critically analyze problems and build a career even in fields like data science, stock market etc.

Course Outcome (CO)

1. Semester-1

MJ-1A1/B1: Mathematical Methods and Mechanics (Including STR)

Credit: Theory – 03
Practical – 01

After completion of this course students should learn the basics of vector algebra, vector calculus, infinite series, partial derivatives, differential equations etc. They will learn all these stuffs in details so that they can really apply them in context of real physical problems in latter part of their four-year course. Also students will brush up their knowledge of Galilean mechanics and Newton's laws of motion. They will learn the concepts of system of particles, central force, classical scattering and eventually some exposures on special theory of relativity. In the practical class they will learn to check and verify the theory learnt in the classroom. They will learn to carry out basic measurements and the use of vernier callipers and screw gauge. Also study of bar pendulum and Kater's pendulum will enlighten them regarding rigid body motion.

2. **Semester - 1**
   SEC-1: Introduction to Python programming and Graph Plotting
   Credit: Theory – 00
   Practical – 03

   This course will enhance the programming skill of the students to a great extent and will help to build a strong foundation in Python, which is the most important programming language to learn if we consider the demand of the job market as well as the requirements of academia. They will get to know the basic concepts of data types, the libraries, the modules and how to apply them to solve various real-life problems.

Programme: Bachelor of Science with Economics (Physical Science/ Mathematical & Computer Science)

Bachelor of Arts with Economics (Social Science)

Programme Specific Outcome (PSO)

- The students will be able to learn the basic theories of Microeconomics and Macroeconomics
- They will also learn the different problems related to growth and development and the different theories related to it
- They will be familiar with the conditions of India Economy and the current issues related to growth and development, agriculture and industry, population, poverty and inequality, balance of payment and foreign exchange and the policy framework to address them.
- They will also be exposed to the financial system of a country-the functioning of the banking system, money and capital market etc.
- They will also learn some basic statistical tools and able to collect, tabulate, present and analyze the data.

Course Outcome (CO)

1. *Semester I*
   Course name: Major/ Minor
   Paper: Microeconomics
   Course code: ECOPMJ101
   Credit: 4 [Theory 3 Practical 1]
   Marks: 75

After completion of this course, the students should be able to

- Understand the basic questions of Economics
- Be familiar with the factors behind demand and supply-the market mechanism and market equilibrium
- Understand how a rational individual consumer behaves
- Understand the behavior of a rational producer

- Know about the ideal market structure, i.e., the perfectly competitive market and the short run and long run equilibrium of a firm and industry
- Comprehend the deviation from the perfect competitive market-the imperfect market structures-monopoly equilibrium
- Know about the input markets and the theories of wage, rent, interest and profit

2. *Semester I*
   Course name: SEC
   Paper: Basic Computer Applications in Economics
   Course code: ECOSEC01
   Credit: 3 [Practical]
   Marks: 50

   After completing this course, the students will be able to use the file system on a computer, use MS Word for word processing, use MS Excel for spreadsheet solutions, use MS PowerPoint for presentations and communicate and present their ideas well. The students will gain the basic computer skills that are important for their studies and careers.

3. *Semester II*
   Course name: SEC
   Paper: Introductory Statistics and Its Application
   Course code: ECOSEC02
   Credit: 3 [Practical]
   Marks: 50

   Course Objective:
   This course aims to introduce the basic concepts and techniques of descriptive and inferential statistics, and to demonstrate their applications in various fields of economics using MS Excel. The course aims to equip the students with the skills of data collection, compilation, presentation and analysis using MS Word and MS Excel. The course also intends to familiarize the students with the measures of central tendency, dispersion, skewness and kurtosis and their interpretation in economic contexts.

   Course Learning Outcomes:
   By the end of this course, the students will be able to identify and use appropriate sources of data for economic analysis and also able to compile and present data in tabular and graphical forms using MS Word and MS Excel. The course also useful to calculate and interpret the measures of central tendency, dispersion, skewness and kurtosis for simple and grouped frequency distributions using MS Excel and apply the statistical tools learned in this course to analyze economic problems and situations.

Programme: Bachelor of Science with Geography

Programme Specific Outcome (PSO)

- Students will be entirely equipped with the knowledge of all the branches of geography such as physical, human geography.
- Students will acquire the ability to analyze and explain physical phenomena with the basic principles and fundamentals and to write it concisely.

- Students will be enriched with the knowledge and training to operate many Surveying instruments and to carry out different survey.
- Students will attain the ability to work individually or in a group following a systematic plan.
- Introduction of Computer under CBCS at the UG level will upgrade the Quality of Education of the students.
- Students will achieve the confidence to prepare and defend a scientific presentation in their individual capacity.
- This ability will help them to formulate environmental plans and to manage and conserve vegetation, soil, water etc
- They may apply theories and concepts to particular cases, and ability to provide critical assessment of arguments.

Course Outcome (CO)

1. *Semester I*

Course name: Major/ Minor
Paper: Fundamentals of Earth System Science
Course code: ECOPMJ101
Credit: 4 [Theory]
Marks: 75

Course Learning Outcomes
After the completion of course, the students will have ability to:
1. Understand the functioning of Earth systems in real time and analyze how the natural and anthropogenic operating factors affects the development of landforms
2. Distinguish between the mechanisms that control these processes
3. Understand different aspects of physical geography like hydrology, oceanography, climatology and soil science.

2. Semester I

Course name: SEC
Paper: Computer Basics and Applications (Practical)
Course code: GEOSEC01
Credit: 3 [Practical]
Marks: 50

Course Objective
This course is designed to get a preliminary ideas of computer and its applications. Those who didn't learn computer in 10+2 level, this course is a stepping stone for them to venture first time into computer-based applications. The objectives of the course are -

- To get an overview of the computer system and its applications.
- To get an exposure to the computer-based applications.

Course Learning Outcomes
Upon completion of this course, students will be able to -

- Get an working knowledge of computer hardware and software.
- Get an idea of managing folders and files.
- Run an application, preferably, MS Word, MS Excel, MS PowerPoint.

3. *Semester II*

Course name: SEC
Paper: Coastal Management (Practical)
Course code: GEOSEC02
Credit: 3 [Practical]
Marks: 50

After completion of the course, students will learn about:

1. Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms.
2. Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism.
3. Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution
4. Principles of Coastal Zone Management. Exclusive Economic Zone and ICZM
5. Coastal Regulation Zones with reference to India (2018-2019).

Programme: Batchelor of Science with Anthropology

Programme Specific Outcome (PSO)

- Students of General Anthropology may learn basics of health, illness, and nutrition. They may able to know or assess about own health and nutritional condition along with they can decide the suitable measures for the illness and malnutrition.
- Students will achieve the confidence to prepare and defend a scientific presentation in their individual capacity.
- Students will acquire the ability to understand and aware about the origin and evolution of human and their culture through time. Gathering knowledge through different prehistoric methodologies on our ancestors' cultural evidences left out in different parts of the world will also encourage them to know the origin, evolution and diversity.
- Students will acquire the ability to understand and aware about the origin of both cultural and human biological diversity through time. Gathering knowledge on primatology as well as paleoanthropology will also encourage them to know the origin.
- Students will attain the ability to work individually or in a group following a systematic plan.
- Students will attain the ability to work individually or in a group following a systematic plan.

Course Outcome (CO)

1. *Semester I*
Course name: Major/ Minor
Paper: Introduction to Anthropology
Course code: ANTHMJ101
Credit: 4 [Theory 3 Practical 1]
Marks: 75

Understand Biological Anthropology

- Define biological anthropology, its aims, and scope.
- Identify and describe the branches of biological anthropology.
- Classify and describe the features of living primates, understanding their significance in the study of human evolution and diversity.

Explore Social Cultural Anthropology

- Define social cultural anthropology, its aims, and scope.
- Understand and describe the branches of social cultural anthropology.
- Analyze the concepts of culture and society, recognizing their centrality in social cultural anthropology.
- Appreciate the importance of fieldwork and identify its key features and methodologies.

Investigate Archaeological Anthropology

- Define archaeological anthropology, its aims, and scope.
- Identify and describe the branches of archaeological anthropology.
- Understand the Three Age System and the periodization of prehistory, recognizing their importance in the study of human past.
- Trace the historical development of Indian prehistory within the broader context of archaeological study.

2. Semester I

Course name: SEC
Paper: Assessment of Nutritional Status (Practical)
Course code: ANTHSEC01
Credit: 3 [Practical]
Marks: 50

Upon successful completion of this practical course, students will be able to:

Conduct Dietary Assessments Practically

- Apply standards for nutrient intake in real-life dietary assessments.
- Evaluate food labels in practical settings to determine nutrient content.
- Measure food consumption of individuals accurately and analyze the data using food composition tables and databases.

Perform Anthropometric Measurements Accurately

- Execute anthropometric measurements for adults, including weight, height, circumferences, skinfold thickness, and breadths, using standard techniques and tools.
- Record and interpret the anthropometric data to assess the nutritional status of adults

3. *Semester II*

Course name: SEC
Paper: Study of Development Programme (Practical)
Course code: ANTHSEC02
Credit: 3 [Practical]
Marks: 50

Upon successful completion of this practical course, students will be able to:

Conduct Fieldwork and Data Collection

- Undertake fieldwork for a minimum of 10 days to collect relevant data for evaluating development projects or policies.
- Apply various methods and techniques of data collection effectively in real-world settings.

Evaluate and Report on Development Projects/Policies

- Prepare detailed evaluation reports on developmental projects or policies.
- Include all necessary components in the reports: abstract, title, background, objectives, literature review, methods and techniques of data collection, data analysis, results, discussion, and references.

Analyze and Discuss Developmental Data

- Analyze collected data to draw meaningful conclusions about the effectiveness of development projects or policies.
- Discuss the results in a comprehensive manner, highlighting key findings and their implications.