| Title | Modules of Syllabus, Classes and Examinations |
|-------|-----------------------------------------------|
| Session | 2019-20  (Odd Semester) |
| Department | B.Sc General in Mathematics |
| Institution Name | Hiralal Bhakat College, Nalhati, Birbhum, W.B. |
| Coordinator | Dr. Banshidhar Sahoo, Assistant Professor in Mathematics |

# Details of Courses of B.Sc. General under CBCS

| Sl. | Course | Credit | | Marks |
|-----|--------|--------|--|-------|
| 1. | Core Course (12 Papers) 4 core papers each in 3 disciplines of choice | Theory+Practical 12×(4+2)=72 | Theory+Tuitorial 12×(5+1)=72 | 12×75=900 |
| 2. | Elective Course DSE ( 6 Papers) | 6×(4+2)=36 | 6×(5+1)=36 | 6×75=450 |
| 3 | Ability Enhancement Core Course (AECC)  AECC-1 (ENVS)  AECC-2 (English/MIL) | 4×1=4 2×1=2 | 4×1=4 2×1=2 | 100 50 |
| 4. | SEC (4 Papers) | 4×2=8 | 4×2=8 | 4×50=200 |
| | Total Credit: | 122 | 122 | 1700 |

# B.Sc. Mathematics General Course Structure

| Semester | Course Course (CC) | Discipline Specific Elective (DSE) | Ability Enhancement Course | |
|---|---|---|---|---|
| | | | AECC (2) | SEC (4) |
| I | CC1A (Mathematics) <br> CC2A (Physics) <br> CC3A (Computer Sc.) | | AECC-1 | |
| II | CC1B (Mathematics) <br> CC2B (Physics) <br> CC3B (Computer Sc.) | | AECC-2 | |
| III | CC1C (Mathematics) <br> CC2C (Physics) <br> CC3C (Computer Sc.) | | | SEC-1 (Mathematics) <br> or <br> SEC-1 (Computer Sc.) |
| IV | CC1D (Mathematics) <br> CC2D (Physics) <br> CC3D (Computer Sc.) | | | SEC-2 (Mathematics) <br> or <br> SEC-2 (Computer Sc.) |
| V | | DSE1A (Mathematics) <br> DSE2A (Physics) <br> DSE3A (Computer Sc.) | | SEC-3 (Mathematics) <br> or <br> SEC-3 (Physics) |
| VI | | DSE1B (Mathematics) <br> DSE2B (Physics) <br> DSE3B (Computer Sc.) | | SEC-4 (Mathematics) <br> or <br> SEC-4 (Physics) |

# Semester-I

## Core Course (CC 1A):     Differential Calculus

- ➢ Total 75 Marks
- ➢ 60 Marks for Semester-end-Examination[**](will be organized by University)
- ➢ 10+5=15 Marks for Internal Assessment (will be organized by College in general andDepartment in Particular )
- ➢ 10 Marks for Class Test/ Assignment/ Seminar
- ➢ 5 Marks for Attendance
  - Attendance: 50% & above but below 60% - 2 Marks
  - Attendance: 60% & above but below 75% - 3 Marks
  - Attendance: 75% & above but below 90% - 4 Marks
  - Attendance: 90% & Above - 5 Marks

| Internal Assessment | Component 1 ($C_1$) |
|---|---|
| Weightage | 10 Marks (Class test) |
| Number of Questions | 5 |
| Date | 03.12.2019 |
| Time | 11.30 am |
| Syllabus | Limit and Continuity, Types of discontinuities, Differentiability of function, Successive derivative, Leibnitz's Theorem, Partial differential, Euler's Theorem. Tangent and Normal, Curvature, Asymptotes, Singular Points, Tracing of Curves. Polar Coordinates and tracing of curves in polar coordinates. |
| Name of Teacher | Dr. Banshidhar Sahoo |
| Number of Classes | 75  (Tentative) |

## ** Component 2 ($C_2$):
- ➢ 60Marks for Semester-end-Examination (will be organized by University)
- ➢ Answer 10 questions out of 15 carrying 02 marks each = 10 x 02 = 20 marks
- ➢ Answer 04 questions out of 06 carrying 05 marks each = 04 x 05 = 20 marks
- ➢ Answer 02 questions out of 04 carrying 10 marks each = 02 x 10 = 20 marks

## ** Syllabus:

Limit and Continuity, Types of discontinuities, Differentiability of function, Successive derivative, Leibnitz's Theorem, Partial differential, Euler's Theorem.
Tangent and Normal, Curvature, Asymptotes, Singular Points, Tracing of Curves. Polar Coordinates and tracing of curves in polar coordinates.
Rolles's Theorem, MVT, Taylor's theorem with Lagrange's and Cauchy's form of remainder. Taylor's series, Maclaurin's series of $\sin(x)$,  $\cos(x)$, $e^x$, $\log(1+x)$. Maxima and minima. Indeterminate form.

# Semester-III

## Core Course (CC 1C):    Real Analysis

- Total 75 Marks
- 60 Marks for Semester-end-Examination[**](will be organized by University)
- 10+5=15 Marks for Internal Assessment (will be organized by College in general andDepartment in Particular )
- 10 Marks for Class Test/ Assignment/ Seminar
- 5 Marks for Attendance
  - Attendance: 50% & above but below 60% - 2 Marks
  - Attendance: 60% & above but below 75% - 3 Marks
  - Attendance: 75% & above but below 90% - 4 Marks
  - Attendance: 90% & Above - 5 Marks

| Internal Assessment | Component 1 (C₁) |
|---|---|
| Weightage | 10 Marks (Class test) |
| Number of Questions | 5 |
| Date | 16.12.2019 |
| Time | 11.30 am |
| Syllabus | Finite and infinite sets, countable and uncountable sets. Real line, bounded sets, supremum and infimia, completeness, property of R. Archimedean property of R, intervals. Concept of cluster points and statement of Bolzano-weierstrass theorem.<br><br>Real sequence, Bounded sequence, Cauchy convergent critarion for sequences. Cauchy's theorem on limits, monotone sequences and their convergence. |
| Name of Teacher | Dr. Banshidhar Sahoo |
| Number of Classes | 70  (Tentative) |

## ** Component 2 (C₂):

- 60Marks for Semester-end-Examination (will be organized by University)
- Answer 10 questions out of 15 carrying 02 marks each = 10 x 02 = 20 marks
- Answer 04 questions out of 06 carrying 05 marks each = 04 x 05 = 20 marks
- Answer 02 questions out of 04 carrying 10 marks each = 02 x 10 = 20 marks

## ** Syllabus:

Finite and infinite sets, countable and uncountable sets. Real line, bounded sets, supremum and infimia, completeness, property of R. Archimedean property of R, intervals. Concept of cluster points and statement of Bolzano-weierstrass theorem.

Real sequence, Bounded sequence, Cauchy convergent critarion for sequences. Cauchy's theorem on limits, monotone sequences and their convergence.

Infinite series, Cauchy convergence criterion for series, positive term series, geometric series, comparison

test, convergence of p-series. Root test, alternating series. Leibnitz's test. Definition and example of absolute and conditionally convergent series.

Sequence and series of functions, Pointwise and uniform convergence, $M_n$ –test, M-test. Statement of theresult about uniform convergence and integrability and differentiability of function. Power series and radius of convergence.

## Skill Enhancement Course (SEC 1):    Integral Calculus

- ➢ Total 50 Marks
- ➢ 40 Marks for Semester-end-Examination[**] (will be organized by University)
- ➢ 10  Marks for Internal Assessment (will be organized by College in general and Department in Particular )
- ➢ 10 Marks for Class Test/ Assignment/ Seminar

| Internal Assessment | Component 1 ($C_1$) |
|---|---|
| Weightage | 10 Marks (Assignment) |
| Number of Questions | 5 |
| Date | To be announced |
| Time | 11.30 am |
| Syllabus | Integration by Partial fractions, integration of rational and irrational functions. Properties of definite integrals. Reduction formulae for integrals of rational, trigonometric, exponential and logaritmmic function and their properties. |
| Name of Teacher | Dr. Banshidhar Sahoo |
| Number of Classes | 30  (Tentative) |

## ** Component 2 ($C_2$):
- ➢ 40Marks for Semester-end-Examination (will be organized by University)
- ➢ Answer 10 questions out of 15 carrying 02 marks each = 10 x 02 = 20 marks
- ➢ Answer 04 questions out of 06 carrying 05 marks each = 04 x 05 = 20 marks

## ** Syllabus:
Integration by Partial fractions, integration of rational and irrational functions. Properties of definite integrals. Reduction formulae for integrals of rational, trigonometric, exponential and logaritmmic function and their properties.

Areas and length of curves in the plane, volumes and surfaces of solids of revolution. Doublend triple integrals.

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