

**JAWAHARLAL NEHRU COLLEGE : BOKO**  
**DEPARTMENT OF MATHEMATICS**  
**Under DBT Star College Scheme**

**Academic Year 2019-20**

The Choice Based Credit System (CBCS) in UG programme under Gauhati University starts from the session 2019-20. Department of Mathematics of Jawaharlal Nehru College offers the CBCS UG course in the first semester B.A./B.Sc. The programmes under this department are

1. H.S. (Under Assam Higher Secondary Education Council)
2. B.A./B.Sc. CBCS course (Honourse/Major and General) (Under Gauhati University)
3. M.A./M.Sc. CBCS course in Mathematics (Under Gauhati University)

The seat capacity for BA/B.Sc. 1<sup>st</sup> semester (Honours) is 30 and 20 seats for the course M.Sc.

The number of applicants for admission to B.Sc. 1<sup>st</sup> Semester and M.Sc. 1st semester and the number of enrolled students in this academic year are

| Class/Course                           | Total Seat | No. of applicants |
|----------------------------------------|------------|-------------------|
| B.A./B.Sc. 1 <sup>st</sup> Sem-Honours | 40         | 48                |
| B.A./B.Sc. 1 <sup>st</sup> Sem-General | 50         | -                 |
| M.A./M.Sc. 1 <sup>st</sup> Sem         | 20         | 56                |

**List of Students in**

**First Year – Honours**

| Sl No | Class Roll No | Name                | Remark |
|-------|---------------|---------------------|--------|
| 1     | 3             | Mampa Ray           |        |
| 2     | 6             | Chiranjit Baroi     |        |
| 3     | 8             | Sanjib kumar Das    |        |
| 4     | 17            | Baharul Islam       |        |
| 5     | 18            | Foridul Islam       |        |
| 6     | 36            | Jahanur Islam       |        |
| 7     | 37            | Rakesh Saha         |        |
| 8     | 38            | Baser Uddin         |        |
| 9     | 41            | Pranab Nath         |        |
| 10    | 69            | Rahul Das           |        |
| 11    | 70            | Jagdish Das         |        |
| 12    | 71            | Subrata Rabha       |        |
| 13    | 73            | Himasri Basumatary  |        |
| 14    | 77            | Bhabesh kumar Das   |        |
| 15    | 99            | Bhaiolina Choudhury |        |
| 16    | 105           | Bhitali Choudhury   |        |
| 17    | 120           | Sobison Rabha       |        |
| 18    | 123           | Saurav Das          |        |
| 19    | 129           | Rejina Sultana      |        |
| 20    | 134           | Wahab Ali           |        |
| 21    | 135           | Dilip Mandal        |        |
| 22    | 141           | Ajabul Hoque        |        |
| 23    | 144           | Ashamoni Rabha      |        |
| 24    | 147           | Ratul Das           |        |
| 25    | 151           | Lalmia Ahmed        |        |
| 26    | 165           | Akshay Boro         |        |

**Second Year – Major**

| Sl No | Class Roll No | Name                 |
|-------|---------------|----------------------|
| 1     | 1             | Jaminur Ali Akhtar   |
| 2     | 2             | Sashanka Rabha       |
| 3     | 3             | Mainamati Das        |
| 4     | 9             | Pratik Saha          |
| 5     | 10            | Chiranjit Baroi      |
| 6     | 15            | Izabul Hoque         |
| 7     | 16            | Kakuli Rabha         |
| 8     | 21            | Mohidul Islam        |
| 9     | 24            | Himangshu Kalita     |
| 10    | 25            | Najrul Hoque         |
| 11    | 27            | Kuldip Das           |
| 12    | 29            | Munmi Kalita         |
| 13    | 34            | Karabi Kalita        |
| 14    | 41            | Bhupati Sarkar       |
| 15    | 42            | Abdur Rezzak         |
| 16    | 43            | Atifa Hussain        |
| 17    | 53            | Aftoba Nargis Khyaum |
| 18    | 67            | Ajay Sony            |
| 19    | 80            | Asma Begum           |
| 20    | 90            | Nandita Rabha        |
| 21    | 93            | Gautam Boro          |
| 22    | 94            | Saifur Rahman        |
| 23    | 102           | Fulchan Ali          |
| 24    | 110           | Mizanur Rahman       |

**Third Year – Major**

| Sl No | Name            | Remarks    |
|-------|-----------------|------------|
| 1     | Rupam Kumar     | 8638773706 |
| 2     | Jayanta Kalita  | 9101490860 |
| 3     | Ananda Das      |            |
| 4     | Bikas Doloi     |            |
| 5     | Mausam Nath     | 8761901317 |
| 7     | Bikash Thakuria |            |
| 8     | Biswajit Das    |            |
| 9     | Dhiru Das       | 8472809549 |
| 10    | Abinash Rabha   | 8011926263 |
| 11    | Shodiul Islam   |            |
| 12    | Manjit Mahanta  | 9101227721 |
| 13    | Lovita Das      | 8472822561 |
| 14    | Biroja Boro     | 9101306590 |
| 15    | Shibani Mandal  |            |
| 17    | Champak Das     |            |
| 18    | Nikumani Kalita |            |
| 19    | Bidyut Das      |            |
| 20    | Momi Kalita     | 8011521804 |
| 21    | Mridula Kalita  |            |
| 23    | Sushmita Rabha  |            |
| 25    | Tutu Moni Das   |            |

|    |                  |  |
|----|------------------|--|
| 26 | Nitul Rabha      |  |
| 27 | Chiranjit Mandal |  |

### M.Sc. First Year

| Sl No | Name                 | Remarks       |
|-------|----------------------|---------------|
| 1     | Raju Kalita          | Continued     |
| 2     | Bhargab Kalita       | Not Continued |
| 3     | Rupshing Barman      | Continued     |
| 4     | Kuldeep Saikia       | Continued     |
| 5     | Sanjeeb Chouhan      | Continued     |
| 6     | Trailokya Basumotary | Continued     |
| 7     | Pallab kalita        | Continued     |
| 8     | Manab Das            | Continued     |
| 9     | Saidul Islam         | Continued     |
| 10    | Habibur Rahman       | Continued     |
| 11    | Rumi Begum           | Continued     |
| 12    | Kangkana Kalita      | Continued     |
| 13    | Najma Begum          | Continued     |
| 14    | Manajit Pal          | Continued     |
| 15    | Shamim Akhtar        | Continued     |
| 16    | Jayashree Rajbongshi | Continued     |
| 17    | Sandeep Kr. Saikia   | Continued     |
| 18    | Sabita Khatun        | Continued     |
| 19    | Monirul Islam        | Continued     |
| 20    | Mridupawan Talukdar  | Not Continued |

### M.Sc. 2nd Year

| Sl No | Name                  | Remarks       |
|-------|-----------------------|---------------|
| 1     | Zaheer Hussain        | Continued     |
| 2     | Hemoprobha Boro       | Continued     |
| 3     | Banashree Kalita      | Continued     |
| 4     | Kangkan Kr. Das       | Not Continued |
| 5     | Trina Mahanta         | Continued     |
| 6     | Suabrat Deka          | Not Continued |
| 7     | Dhritismita Thakuria  | Continued     |
| 8     | Pranjit Das           | Continued     |
| 9     | Jeherul Islam         | Continued     |
| 10    | Karabi Bora           | Continued     |
| 11    | Amarul Hoque          | Not Continued |
| 12    | Pranjal Kishor Kalita | Not Continued |
| 13    | Sunny Das             | Continued     |
| 14    | Mridul Rabha          | Not Continued |
| 15    | Sehnaz Ahmed          | Continued     |
| 16    | Nazma Ara Saikia      | Continued     |
| 17    | Ohidur Rahman         | Continued     |
| 18    | Zahir Alom            | Continued     |
| 19    | Akshayjyoti Hatibarua | Continued     |
| 20    | Arunima Kalita        | Continued     |

**Infrastructure facilities of the Department:**

- Class rooms – 04
- Computer Lab – 01 (with 10 desktops)
- Departmental Library – 01 (with 300 text and reference books)
- Teacher's common room – 01
- Aqua guard for drinking water – 01
- Toilet – 02
- Wall magazine – 01

**Faculty Strength:**Permanent Faculties

| Sl. No | Name               | Qualification           | Designation | Special Papers    | Period of Service |
|--------|--------------------|-------------------------|-------------|-------------------|-------------------|
| 01     | Dr. Dhiraj Kr Das  | M.Sc. Ph.D, PGDCA       | Asso. Prof. | Relativity        | From Aug, 91      |
| 02     | Dr. Nabajyoti Das  | M.Sc. Ph.D              | Asso. Prof  | Func Analysis     | From Nov,93       |
| 03     | Dr. Alok Das       | M.Sc. Ph.D              | Asso. Prof  | Fluid Dynamics    | From Nov, 96      |
| 04     | Dr. Dipankar Sarma | M.Sc. Ph.D, B.Ed.PGDHRM | Asso. Prof. | Algebra, Topology | From Dec, 97      |

Temporary fulltime faculties

| Sl. No | Name                     | Qualification | Designation     | Special Papers           | Period of Service |
|--------|--------------------------|---------------|-----------------|--------------------------|-------------------|
| 01     | Mr. Kabindra Goswami     | M.Sc.         | Asstt Professor | Algebra. Logic           | From Aug, 17      |
| 03     | Mr. Dipu Moni Nath       | M.Sc.         | Asstt Professor | F Analysis. Algebra      | From Nov, 18      |
| 06     | Miss Anindita Basumatary | M.Sc.         | Asstt Professor | Relativity               | From Feb, 19      |
| 04     | Mr. Naba Kalita          | M.Sc.         | Asstt Professor | Relativity, Numerical A. | From Sep, 19      |

**Mentor – Mentee Group Table:**

| Mentor Teacher | Class                                                        |                                                                                                       |                                                                                                              |
|----------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|                | B.Sc. 1 <sup>st</sup> year                                   | B.Sc. 2 <sup>nd</sup> Year                                                                            | B.Sc. 3 <sup>rd</sup> Year                                                                                   |
| Dr. D. K. Das  | Mampa Ray, Faridul Islam, Pranab Nath, Himashree Basumatary  | Jaminur Ali Akhtar<br>Izabul Hoque<br>Kuldip Das Bhupati Sarkar<br>Ajay Sony                          | Rupam Kumar, Mausam Nath, Abinash Rabha, Biroja Boro, Nikumani Kalita, Afzalur Rahman, Nitul Rabha           |
| Dr. N. J. Das  | Chiranjit Baroi, Jahanur Islam, Rahul Das, Bhabesh Kumar Das | Sashanka Rabha, Kakuli Rabha<br>Najrul Hoque Abdur Rezzak Asma Begum                                  | Jayanta Kalita, Bikash Thakuria, Shodiul Islam, Shibani Mandal, Bidyut Das, Sushmita Rabha, Chiranjit Mandal |
| Dr. A. Das     | Sanjib K Das, Rakesh Saha, Jagadish Das, Bhaolina Chaudhry   | Mainamati Das<br>Mohidul Islam<br>Munmi Kalita Atifa<br>Hussain Nandita Rabha<br>Mizanur Rahman       | Ananda Das, Biswajit Das, Manjit Mahanta, Akimul Huaaian, Momi Kalita, Shohidul Islam, Raj Kumar Rabha       |
| Dr. D. Sarma   | Baharul Islam, Baser Uddin, Subrata Rabha, Bhitali Ch        | Pratik Saha Himangshu<br>Kalita Karabi Kalita<br>Aftoba Nargis Khyaum<br>Saifur Rahman Fulchan<br>Ali | Bikas Dolo, Dhiru Das, Lovita Das, Champak Das, Mridula Kalita, Tutu Moni Das, Nurjamal Hoque                |

### Papers Taught in the department

#### B.A./B.Sc Major/Honours Course

| Semester                 | Paper 1                               | Paper II                                             | Paper III                   | Paper IV                      |
|--------------------------|---------------------------------------|------------------------------------------------------|-----------------------------|-------------------------------|
| 1 <sup>st</sup> Semester | Calculus(including practical)         | Algebra                                              | x                           | x                             |
| 2 <sup>nd</sup> Semester | Real Analysis                         | Differential Equations (including practical)         | <u>x</u>                    | <u>x</u>                      |
| 3 <sup>rd</sup> Semester | Theory of Real Functions              | Group Theory-I                                       | Analytical Geometry         | <u>SEC</u> - Computer Algebra |
| 4 <sup>th</sup> Semester | Multivariate Calculus                 | Numerical Methods (including practical)              | Ring Theory                 | <u>SEC</u> - R-Programming    |
| 5 <sup>th</sup> Semester | Riemann Integration and Metric spaces | Linear Algebra                                       | <u>DSE</u> -Number Theory   | <u>DSE</u> -C-programming     |
| 6 <sup>th</sup> Semester | Complex Analysis                      | Partial Differential Equations (including practical) | <u>DSE</u> - Hydromechanics | <u>DSE</u> - Rigid Dynamics   |

#### B.A./B.Sc Generic/Regular Course

| Semester                 | Paper 1                | Paper II                            |
|--------------------------|------------------------|-------------------------------------|
| 1 <sup>st</sup> Semester | Calculus               | x                                   |
| 2 <sup>nd</sup> Semester | Algebra                | <u>x</u>                            |
| 3 <sup>rd</sup> Semester | Differential Equations | <u>x</u>                            |
| 4 <sup>th</sup> Semester | Real Analysis          | <u>x</u>                            |
| 5 <sup>th</sup> Semester | Number Theory          | SEC- Combinatorics and Graph Theory |
| 6 <sup>th</sup> Semester | Numerical Analysis     | SEC- LaTeX and HTML                 |

#### M.A./M.Sc Course

| Class/Paper         | Paper I                               | Paper II                               | Paper III                    | Paper IV                           | Paper V                                    |
|---------------------|---------------------------------------|----------------------------------------|------------------------------|------------------------------------|--------------------------------------------|
| 1 <sup>st</sup> Sem | Algebra                               | Differential Equations                 | Mechanics and Tensors        | Real Analysis and Lebesgue Measure | Programming with C                         |
| 2 <sup>nd</sup> Sem | Complex Analysis                      | Topology                               | Functional Analysis          | Number Theory and Graph Theory     | Mathematical Methods                       |
| 3 <sup>rd</sup> Sem | Continuum Mechanics and Hydrodynamics | Dynamical Systems and Fractal Geometry | Special Theory of Relativity | Fuzzy Sets & Systems               | Partial Differential Equations             |
| 4 <sup>th</sup> Sem | Operation Research                    | Numerical Analysis                     | Measure Theory               | Fluid Dynamics                     | General Theory of Relativity and Cosmology |

## **Record of Departmental Activities:**

### **Programme 1**

#### **Summer Training on Practical Mathematics using Mathematica**

Date: From 27<sup>th</sup> June to 2<sup>nd</sup> July, 2019

**Resource Person:** Prof. T. K. Dutta ,

Prof. Hemanta Kumar Sarma,

Dr. Debashish Bhattacharjee,

Dr. Ranu Poul

Dr. N. J. Das,

Miss Darathi Kalita

Gauhati University, Guwahati

J. N. College

Participants : UG & PG students of college

No of participants : 36

**Some photographs:**





## Programme 2

Seminar on ‘Some Numerical methods and their applications’

Under DBT Star College Scheme

Resource Person : Dr. Nilakshi Goswami, Asstt Professor, Dept of Mathematics, Gauhati University.

Date : 13<sup>th</sup> November, 2019

Target Group : PG Students of the college

No. of Participants : 26

## Some photographs:



## Teaching Plane Model:

| TEACHING PLAN OF TEACHERS                |                               |                               |                                                |                           |         |
|------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|---------------------------|---------|
| Name of the Teacher : Dr. Dipankar Barua |                               |                               | Subject: Mathematics                           |                           |         |
| Session : 2019-20                        |                               |                               | Month: July, 19 to December, 19 (Old Semester) |                           |         |
| Allocated No. of Classes per week        |                               |                               |                                                |                           |         |
| H.S. 1 <sup>st</sup> Year                | B.Sc. 1 <sup>st</sup> Sem (H) | B.Sc. 3 <sup>rd</sup> Sem (H) | B.Sc. 3 <sup>rd</sup> Sem (H)                  | M.Sc. 1 <sup>st</sup> Sem |         |
| 03                                       | 04                            | 04                            | 05                                             | 04                        |         |
| No. of Teaching Days                     |                               |                               |                                                |                           |         |
| July, 19                                 | August, 19                    | Sept, 19                      | Oct, 19                                        | Nov, 19                   | Dec, 19 |
| 00                                       | 22                            | 25                            | 15                                             | 25                        | 25      |

  

| Class     | Semester | Paper                 | Unit | Contents                                                                                                                                                                                                        | No. of periods | Remarks |
|-----------|----------|-----------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|
| B.Sc. (H) | I        | MAT-40C-102K: Algebra | 1    | Polar representation of complex numbers, nth roots of unity, De Moivre's theorem for rational indices and its applications. Statements and logic, statements with quantifier, compound statements, implications | 04             | ✓       |
|           |          |                       | 2    | proofs in Mathematics. Sets, operations on sets, family of sets, power sets, Cartesian product                                                                                                                  | 03             | +1 = 04 |
|           |          |                       |      | Functions, one-one, onto functions and bijections, Composition of functions, Inverse of a function                                                                                                              | 02             | 03      |
|           |          |                       |      | Image and inverse image of subsets                                                                                                                                                                              | 03             | 04      |
|           |          |                       |      | Relation, Equivalence relations, Equivalence classes and partitions of a set.                                                                                                                                   | 02             | 03      |
|           |          |                       |      | Congruence modulo n in integers, Induction Principles, the well-ordering principle, greatest common divisor of integers, Homomorphism of groups, Fundamental theorems of homomorphism, Cauchy's theorem.        | 03             | 03      |
|           |          |                       |      | Rings Integral domains division rings and fields, subrings, characteristic of a ring, idempotent and nilpotent elements in a ring.                                                                              | 03             | 03      |

  

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|  |  |  |                                                                                            |  |    |        |
|--|--|--|--------------------------------------------------------------------------------------------|--|----|--------|
|  |  |  | Integral, Integration and Differentiation, $\Gamma$ -function and<br>theorems of calculus. |  | 81 | +1 = 2 |
|  |  |  | Integration of vector valued functions.                                                    |  |    |        |

  

| TEACHING PLAN OF TEACHERS                |                               |                               |                                                |                           |          |
|------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|---------------------------|----------|
| Name of the Teacher : Dr. Dipankar Barua |                               |                               | Subject: Mathematics                           |                           |          |
| Session : 2019-20                        |                               |                               | Month: January, 20 to June, 20 (Even Semester) |                           |          |
| Allocated No. of Classes per week        |                               |                               |                                                |                           |          |
| H.S. 1 <sup>st</sup> Year                | B.Sc. 1 <sup>st</sup> Sem (H) | B.Sc. 3 <sup>rd</sup> Sem (H) | B.Sc. 3 <sup>rd</sup> Sem (H)                  | M.Sc. 1 <sup>st</sup> Sem |          |
| 03                                       | 04                            | 04                            | 05                                             | 04                        | 04       |
| No. of Teaching Days                     |                               |                               |                                                |                           |          |
| Jan, 20                                  | Feb, 20                       | March, 20                     | April, 20                                      | May, 20                   | June, 20 |
| 11                                       | 24                            | 24                            | 22                                             | 22                        | 26       |

  

| Class | Semester | Paper              | Unit | Contents                                                                                                                                                                                                                             | No. of periods | Remarks |
|-------|----------|--------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|
| B.Sc. | II       | C-3: Real Analysis | III  | Infinite series, convergence and divergence of infinite series, ratio test, root test, integral test.                                                                                                                                | 02             |         |
|       |          |                    |      | Cauchy criterion, Tests for convergence: comparison test, limit comparison test, Absolute convergence, rearrangement theorem, alternating series, Leibniz test, conditional (non absolute) convergence                               | 03             |         |
|       |          |                    |      | (G.I) definition of limit and continuity of a function of single variable, properties of continuous functions in closed interval, sequential continuity.                                                                             | 03             |         |
|       |          |                    |      | Inverse function and monotonic function, uniform continuity, Derivability of a function of single variable, alpha of derivatives, and two variable (reducible to single variable), Darboux's theorem, Intermediate value theorem for | 02             |         |
|       |          |                    |      |                                                                                                                                                                                                                                      | 03             |         |

  

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| TEACHING PLAN OF TEACHERS                |                               |                               |                                                |                                                                                                                                                                                                                    |                |         |
|------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|
| Name of the Teacher : Dr. Dipankar Barua |                               |                               | Subject: Mathematics                           |                                                                                                                                                                                                                    |                |         |
| Session : 2019-20                        |                               |                               | Month: July, 19 to December, 19 (Old Semester) |                                                                                                                                                                                                                    |                |         |
| Allocated No. of Classes per week        |                               |                               |                                                |                                                                                                                                                                                                                    |                |         |
| H.S. 1 <sup>st</sup> Year                | B.Sc. 1 <sup>st</sup> Sem (H) | B.Sc. 3 <sup>rd</sup> Sem (H) | B.Sc. 3 <sup>rd</sup> Sem (H)                  | M.Sc. 1 <sup>st</sup> Sem                                                                                                                                                                                          |                |         |
| 03                                       | 04                            | 04                            | 05                                             | 04                                                                                                                                                                                                                 |                |         |
| No. of Teaching Days                     |                               |                               |                                                |                                                                                                                                                                                                                    |                |         |
| July, 19                                 | August, 19                    | Sept, 19                      | Oct, 19                                        | Nov, 19                                                                                                                                                                                                            | Dec, 19        |         |
| 00                                       | 22                            | 25                            | 15                                             | 25                                                                                                                                                                                                                 | 25             |         |
| Class                                    | Semester                      | Paper                         | Unit                                           | Contents                                                                                                                                                                                                           | No. of periods | Remarks |
| B.Sc. (H)                                | I                             | MAT-40C-102K: Algebra         | I                                              | Polar representation of complex numbers, $n$ th roots of unity, De Moivre's theorem for rational indices and its applications. Statements and logic, statements with quantifier, compound statements, implications | 04             |         |
|                                          |                               |                               | II                                             | proofs in Mathematics. Sets, operations on sets, family of sets, power sets, Cartesian product                                                                                                                     | 03             | +1 = 04 |
|                                          |                               |                               |                                                | Functions, one-one, onto functions and bijections, Composition of functions, Inverse of a function                                                                                                                 | 02             | 03      |
|                                          |                               |                               |                                                | Image and inverse image of subsets                                                                                                                                                                                 | 03             | 04      |
|                                          |                               |                               |                                                | Relation, Equivalence relations, Equivalence classes and partitions of a set                                                                                                                                       | 02             | 03      |
|                                          |                               |                               |                                                | Congruence modulo $n$ in integers, Induction Principles, the well-ordering principle, greatest common divisor of integers, Homomorphism of groups, Fundamental theorems of homomorphism, Cauchy's theorem.         | 03             | 03      |
|                                          |                               |                               |                                                | Rings integral domains division rings and fields, subrings, characteristic of a ring, idempotent and nilpotent elements in a ring.                                                                                 | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
|                                          |                               |                               |                                                |                                                                                                                                                                                                                    | 03             | 03      |
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| VI    |     | Paper III<br>Discrete<br>Mathematics | I                                                                                                                                          | derivatives, Rolle's theorem, mean value theorems,<br>Taylor's and Maclaurin's theorems, expansion of $e^x$ as<br>a limit $(1+x/n)^n \rightarrow e^x$ , $x$ as a function of single variable<br>recurrence systems of a function of single variable<br>Divisibility theory: Fermat's theorem, well ordered principle,<br>unbounded induction, division algorithm<br>the least representation theorem, prime numbers, unique<br>factorization theorem | 03<br>02<br>03<br>03 | <i>Done</i>                                      |
|       |     |                                      | II                                                                                                                                         | (Combinatorics) i.e. Basic properties of combinations, residual<br>systems, linear congruences and their solutions,<br>special divisibility tests, the Chinese remainder theorem and<br>its applications, Fermat's Little theorem and Wilson's<br>theorem, Polynomial congruence                                                                                                                                                                     | 05<br>03             | <i>Done</i>                                      |
|       |     |                                      | III                                                                                                                                        | Discrete equations: linear Diophantine equations, the<br>equation $x^2 + y^2 = z^2$ and $x^2 + y^2 = 1$<br>Fermat's last theorem, representation of a number by two or<br>four squares                                                                                                                                                                                                                                                               | 04<br>02             | <i>Done</i>                                      |
|       |     |                                      | IV                                                                                                                                         | Number theoretic functions: Euler's $\phi$ function, Euler's<br>theorem, combinatorial study of the Euler's $\phi$ function, the<br>function $\sigma$ , $\tau$ , $\mu$ , $\lambda$ , $\nu$ and $\omega$ and $\sigma$ , the<br>Möbius function, multiplicative arithmetic functions<br>invertible functions, greatest integer function                                                                                                                | 02<br>03             | <i>Done</i><br><i>not done</i><br><i>Classed</i> |
|       |     |                                      | V                                                                                                                                          | Prepositional calculus: operations on statements, truth<br>function, laws of propositional logic, Boolean algebra of<br>functions, laws of propositional logic, Boolean algebra of<br>statement handles, adequate system of connectives, binary<br>connection 'xor' and 'nand'                                                                                                                                                                       | 04                   | <i>Done</i>                                      |
|       |     |                                      | VI                                                                                                                                         | Boolean Algebra: disjunctive normal form (DNF),<br>complement of Boolean expression in DNF, construction of<br>a Boolean function corresponding to a Boolean expression,<br>conjunctive normal form (CNF), Complement of Boolean<br>expression in CNF, transformation of normal form to the<br>other forms                                                                                                                                           | 04                   | <i>Done</i>                                      |
|       |     |                                      | Applications of Boolean Algebra                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 04                   | <i>Done</i>                                      |
|       |     |                                      | Practical notes: order of an integer mod $n$ , primitive roots<br>for prime, composite numbers having primitive roots<br>theory of indices |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 01<br>01             | <i>Done</i>                                      |
|       |     |                                      | Quadratic residues: Euler's criterion                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 02                   | <i>Done</i>                                      |
| M.Sc. | 2nd | MAT 2046<br>Number Theory            |                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                                                  |

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|  |  |  | II  | Legendre's symbol and its properties<br>Quadratic Reciprocity Law, Quadratic congruence with composite moduli                 | 02<br>02 | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> <i>make class</i><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
|  |  |  | III | Fibonacci numbers: certain identities involving Fibonacci numbers, Continued fractions, Pell's equation                       | 04       |                                                                                                                                                                                                                   |
|  |  |  | IV  | Partitions, graphical representation of partitions, Euler's theorem,<br>generating functions, search for partition identities | 03<br>02 |                                                                                                                                                                                                                   |
|  |  |  | V   | Algebraic numbers, number fields, norm, trace, discriminants.                                                                 | 03       |                                                                                                                                                                                                                   |
|  |  |  |     | Valuations, algebraic integers and integral bases.                                                                            | 02       |                                                                                                                                                                                                                   |

  
 27/11/20

No formal classes are possible due to  
 Covid Pandemic Situation  
 from 21-03-2020 to 21-10-20

## Record of Students progressing to higher education after completing B.Sc. Exam.

| Sl No | Name of the Student | Course                           | Institution         |
|-------|---------------------|----------------------------------|---------------------|
| 1     | Rupam Kumar         | MBA                              | Mumbai              |
| 2     | Jayanta Kalita      | M.Sc. in Mathematics             | Gauhati University  |
| 3     | Dhiru Das           | M.Sc. in Mathematics             | J.N. College        |
| 4     | Sohidul Islam       | M.Sc. in Mathematics             | Bodoland University |
| 5     | Lovita Das          | M.Sc. in Mathematics             | Tezpur University   |
| 6     | Biroja Boro         | M.Sc. in Mathematics & Computing | IIT Bhilai          |
| 7     | Momi Kalita         | M.Sc. in Mathematics             | J.N. College        |

Remark:

Due to Covid-19 pandemic situation and for Nationwide lock down the normal classes are cancelled from 21<sup>st</sup> March, 20. The courses are not completed properly. A few number of online classes are also taken.



(Dhiraj Kr. Das)  
HoD, Mathematics