**Curriculum Plan (ODD SEM 2024): B.Sc. (H) Mathematics III Year (Semester V)**

**DSE-1(ii): ELEMENTS OF NUMBER THEORY**

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| **Dr. Tajender Kumar**  Assistant Professor  Department of Mathematics  Kalindi College (University of Delhi)  Delhi- 110008  Mobile: +91 7417837644  **E- mail**: [tajenderkumar@kalindi.du.ac.in](mailto:tajenderkumar@kalindi.du.ac.in) | |  | **Marks Distribution** | **Theory** | 90 Marks | |
| **Tutorial** | 40 Marks | |
| **Internal Assessment** | Assignment 30 Marks | |
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| **Classes Assigned** | **Lectures** | 3 per week (Theory) | |
| **Tutorial** | 1 per week | |
| **References** |  | 1. Burton, David M. (2011). Elementary Number Theory (7th ed.). McGraw-Hill Education  Pvt. Ltd. Indian Reprint 2017. | | | | |
|  | **Week** | **Topics** | | | |  |
|  | **Beginning/1st week with 3 days**  **(**01-03,05-10AUG) | Revisiting: The division algorithm, divisibility and the greatest common divisor. | | | |  |
|  | **2nd week (**12-17 AUG) | Euclid’s lemma; The Euclidean algorithm, Linear Diophantine equations. | | | |  |
|  | **3rd week (**19-24 AUG) | Euclid’s lemma; The Euclidean algorithm, Linear Diophantine equations.  [1]: Chapter 2 (Sections 2.2, 2.3, 2.4 [up to page 28], and 2.5. All Theorems without proofs). | | | |  |
|  | **4th week (**26-31 AUG) | The Fundamental theorem of arithmetic, The sieve of Eratosthenes, | | | |  |
|  | **5th week (**02-07 SEP) | Euclid’s theorem and the Goldbach conjecture; The Fibonacci sequence and its nature. | | | |  |
|  | **6th week (**09-14 SEP) | Euclid’s theorem and the Goldbach conjecture; The Fibonacci sequence and its nature.  [1]: Chapter 3 (Sections 3.1 [Theorem 3.2 without proof], 3.2 [Theorem 3.4], and 3.3 [up to p 53]).  [1]: Chapter 14 (Sections 14.1, and 14.2 [All results without proofs]). | | | |  |
|  | **7th week (**16-21 SEP) | Basics of cryptography, | | | |  |
|  | **8th week (**23-28 SEP) | Linear Regression: Simple, multiple explanatory variables, polynomial, | | | |  |
|  | **9th week (**30 SEP-05 OCT) | Hill’s cipher, Public-key cryptosystems | | | |  |
|  | **10th week**. (07-12 0CT) | RSA encryption and decryption technique. | | | |  |
|  | **11th week (**14-19 0CT) | RSA encryption and decryption technique.  [1]: Chapter 10 (Section 10.1). | | | |  |
|  | **12th week (**21-26 OCT) | Introduction to perfect numbers, | | | |  |
|  | **13th week (**04-09 NOV) | Mersenne numbers and Fermat numbers. | | | |  |
|  | **14th week (**11-16 NOV) | Mersenne numbers and Fermat numbers.  [1]: Chapter 11 (Sections 11.2 [up to page 223], 11.3 [before Theorem 11.4], and 11.4 [before Theorem 11.10]). | | | |  |
|  | **15th week** (18-23 NOV) | Revision | | | |  |
|  | **16th week only with 2 Days** (25-27 NOV) | Revision | | | |  |
| Dispersal of classes, preparation leave and practical examination begin- 28 November, 2024. | | | | | | |