

**KOLHAN UNIVERSITY, CHAIBASA  
JHARKHAND**



**Revised Curriculum and  
Credit Frame work for SEM – I as per  
FYUGP, NEP- 2020  
(U.G. Mathematics – 2022 Onward)**

**University Department of Mathematics  
Kolhan University, Chaibasa  
West Singhbhum, Jharkhand-833202**

**UNIVERSITY DEPARTMENT OF MATHEMATICS  
KOLHAN UNIVERSITY  
CHAIBASA**

**Four-Year under Graduate Programme (FYUGP)**

As per Provisions of NEP-2020 to be implemented from Academic Year 2022-  
23

**COMPOSITION OF BOARD OF STUDIES**

- 1. Dr. Bijay Kumar Sinha**  
Head, University Department of Mathematics,  
Kolhan University Chaibasa
- 2. Mr. Mahendra Kumar Rana**  
Assistant Professor,  
University Department of Mathematics,  
Kolhan University Chaibasa
- 3. Dr. Md. Moiz. Ashraf**  
Head, P.G. Department of Mathematics  
Karim City, College, Jamshedpur
- 4. Dr. P. C. Banerjee**  
Assistant Professor,  
P.G. Department of Mathematics  
Karim City, College, Jamshedpur

**(Dr. Bijay Kumar Sinha)**  
(Chairman & Head)  
University Department of Mathematics,  
Kolhan University, Chaibasa.

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<b>Semester</b>	<b>Paper</b>	<b>Code</b>	<b>Course Title</b>	<b>Credit</b>
<b>I</b>	Multi-Disciplinary /Introductory Regular Course	MDC/IRC	Introduction Course in Mathematics	3

Program: <b>Certificate</b> Class: <b>UG</b>		Year: <b>First</b>	Semester: <b>I</b>
Subject: <b>Mathematics</b>			
Course Code: <b>MDC/IRC</b>		Course Title: <b>Multi – Disciplinary/Introductory RegularCourse</b>	
<b>Course Learning Outcomes:</b> This course will enable the students to: a) Understand the notions of logic and Mathematical Induction with proofing strategies. b) Basic concepts of sets relation and functions. c) A basic concept of number theory. d) A basic concept of real Analysis.			
Credit: <b>3 (Theory)</b>		<b>Compulsory</b>	
Full Marks: <b>75</b>		Time: <b>3 Hours</b>	
<b>Unit</b>	<b>Content</b>		<b>Hours</b>
<b>I</b>	<b>Logic:</b> statement, truth table, quantifiers, proof strategies, Mathematical induction.		<b>8 h</b>
<b>II</b>	<b>Sets and functions and relations:</b> reflexive, symmetric, asymmetric and transitive relations, injective, surjective and bijective functions.		<b>10 h</b>
<b>III</b>	<b>Theory of numbers:</b> Modular arithmetic, divisibility, Congruence relation, Linear congruence and Chinese remainder theorem, Fermat’s little theorem, Wilson’s theorem, arithmetic functions and set of residue classes modulo n: ‘ $\mathbb{Z}_n$ ’.		<b>8 h</b>
<b>IV</b>	<b>Real number system:</b> Field and order structure, bounded sets, Supremum and infimum of sets, Completeness property of set of Real number $\mathbb{R}$ .		<b>8 h</b>
<b>V</b>	<b>Sequences and series:</b> Limit of a sequence, convergent and non-convergent sequence, Limit points of a sequence, Positive term series, convergent and divergent series, Comparison test of positive term series.		<b>11 h</b>
<b>*Remarks -: No Internal Exam</b>			
<b>Books Recommended:</b> 1. R.G. Bartle and D. R. Sherbert (2002). Introduction to Real Analysis (3rd Edition), John Wiley and Sons (Asia) Pvt. Ltd., Singapore. 2. R. K. Dwivedi (2019). Real Analysis, 1 st Ed., Pragati Prakashan. 3. S.C. Mallik and S. Arora-Mathematical Analysis, New Age International Publications. 4. F. Cajori (1904). An Introduction to The Modern Theory of Equations. The Macmillan Company. 5. Kolman, Busby and Ross (2002). Discrete Mathematical Structure, 4 th Ed., Pearson Education Asia. 6. V. Rajaraman (1993). Computer oriented numerical methods, Prentice Hall India.			