

**P.G. Department of Mathematics Kolhan University, Chaibasa**

Semester	Paper	Code	Course Title	Credit
I	Minor-2A	MN-2A	Sets & Logic	4

Program: <b>Certificate</b> Class: <b>UG</b>	Year: <b>First</b>	Semester: <b>II</b>
Subject: <b>Mathematics</b>		
Course Code: <b>MN2A</b>	Course Title: <b>Sets &amp; Logic</b>	
<b>Course Learning Outcomes:</b> This course will enable the students to: <ol style="list-style-type: none"> <li>Understand the concept equivalence relation &amp; partial order relation.</li> <li>Understand the concept of bounds in POSET and able to understand the concept of Lattice.</li> <li>Understand mathematical logic and logical operations to various fields.</li> </ol>		
Credit: <b>4 (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>Relation:</b> Reflexive, Symmetric, Antisymmetric & transitive relation, Partition, Equivalence relation, Congruence Modulo Relation, Induced relation, Fundamental theorem.	<b>15 h</b>
<b>II</b>	<b>Partial Order Relation:</b> Partial Order Set, <i>l.u.b.</i> & <i>g.l.b.</i> , <i>inf.</i> , <i>sup.</i> , maximal & minimal element. Definition & examples of Lattice, Zorn's lemma	<b>15 h</b>
<b>III</b>	<b>Logic:</b> Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions, and precedence of logical operators.	<b>15 h</b>
<b>IV</b>	<b>Propositional equivalence:</b> Logical equivalences. Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations. Validity of argument by different methods.	<b>15 h</b>
<b>Sessional Internal Assessment (SIA) Full Marks . 25 Marks</b> <b>A . Internal written Examination . 20 Marks (1 Hr)</b> <b>B . Over All Performance including Regularity . 05 Marks</b>		
<b>Books Recommended:</b> <ol style="list-style-type: none"> <li>Set theory by K. K. Jha,</li> <li>R. P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics, Pearson Education,</li> <li>Discrete Mathematics by M. K. Gupta; Krishna Prakashan.</li> <li>Discrete Mathematics by Lipschutz, Lipson &amp; Patil; Schaum's Outlines</li> </ol>		