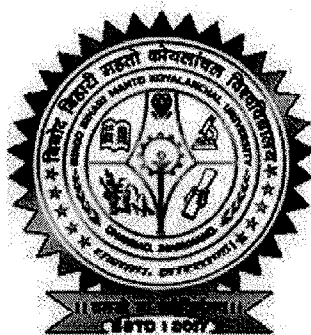# SYLLABUS FOR

THE FOUR -YEAR UNDERGRADUATE PROGRAMME (FYUGP)

As per provisions of NEP-2020 to be implemented from academic year-2023 onwards

Subject Code - SEC (Skill Enhancement courses)

Mathematical and Computational Thinking and Analysis

for

All constituent/affiliated colleges under Binod Bihari Mahato Koyalanchal University, Dhanbad (Jharkhand)

Notification

In exercise of the powers vested in him under the Jharkhand State Universities Act 2000 as amended up-to-date, the Vice-Chancellor is pleased to constitute a Board of Studies (BOS) for the Department of Mathematics at Under Graduate Level, comprising of following members for a period of one year from the date of notification :

1. Dr. R.K. Tiwari
   Head, University Department of Mathematics, BBMKU   - Chairman

2. Dr. Shiv Prasad
   University Department of Mathematics, BBMKU.   -Member

3. Dr. D.N. Singh
   Head, Department of Mathematics
   Chas College, Chas.   -Member

4. Dr. Nasim Ahmad (Retd.)
   Ex- Head, Department of Mathematics,
   P.K. Roy Memorial College, Dhanbad.   - Special Invitee

5. Dr. T.P. Choubey (Retd.),
   Ex- Head, Department of Mathematics,
   Chas College, Chas.   -Special Invitee

By order of the Vice-Chancellor
Sd/-
Registrar
Date ...14/07/2023

Memo No. BBMKU/R/..1229../2022

Copy to: -
1. Persons concerned.
2. Dean, Faculty of Science, BBMKU.
3. Head, University Department of Mathematics.
4. Establishment Section, BBMKU, Dhanbad.
5. P.A. to VC/PVC/R for information to VC/PVC/R.
6. Guard File.

Registrar
BBMKU, Dhanbad.

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Marks Distribution for SEC (Skill Enhancement Courses)

Marks distribution pattern [25 Marks for each credit]

Semester	Subject	Credits	FM	Semester Internal Examination	End Semester University Examination
I	SEC-I	03	75	-------	75
II	SEC-II	03	75	-------	75
III	SEC-III	03	75	-------	75

SEMESTER - 1

SEC- 1

Mathematical and Computational Thinking and Analysis

Credits: 03	1 credit=15hrs 30 lectures & 15 tutorials	F.M.-75 P.M.-30	E.S.E.-75 S.I.E.-....	Time-3hrs

Unit-1: <u>Elementary Arithmetic</u>: Number System and Rapid Method of Calculation, Approximation, Decimalisation, Ratio, Proportion.

<div align="right">2 questions</div>

Unit-2: <u>Sets</u>: Sets and their representation, kinds of sets, finite, infinite sets, Empty set, singleton set, Disjoint sets, sub-set, superset, proper sub-set, Equality of sets, Family or class of sets, Universal set, Venn diagram, Union of sets, Intersection of sets, Difference of sets.

<div align="right">2 questions</div>

Unit-3: <u>Statistics</u>: Definition of statistics, Characteristics of Statistical data, Nature of statistics, Limitation of statistics, Collection of data, Diagrammatic presentation of data, Calculation of frequency distribution.

<div align="right">2 questions</div>

Books Recommended:

(1)Mathematical and Computational Thinking and Analysis: Dr. R. K. Tiwary, Dr. Y. K. Mishra & Dr. B. N. Gupta

(2)Probability and Statistics: Morris H, Degroot

(3) Arithmetic by Lalji Prasad published by Student Friends

SEMESTER – 2

SEC-2

Credits: 03	1 credit=15hrs	F.M.-75	E.S.E.-75	Time-3hrs
	30 lectures & 15 tutorials	P.M.-30	S.I.E.-....	

Unit 1: Logic: Introduction, statement, truth value of a statement, Negation of a statement, Compound or mixed statements.

2 questions

Unit 2: Advanced Arithmetic: Percentages, Simple interest, Compound interest, Surface areas and volumes.   2 questions

Unit 3: Statistics: Measures of central tendency: Mean Median, Mode, Quartile, Decile, and Percentile. Measures of Dispersion: Range, Inter Quartile range, Quartile Deviation, Mean deviation, Standard deviation.

2 questions

Books Recommended:

(1)Mathematical and Computational Thinking and Analysis: Dr. R. K. Tiwary, Dr. Y. K. Mishra & Dr. B. N. Gupta

(2)Probability and Statistics: Morris H, Degroot

(3) Arithmetic by Lalji Prasad published by Student Friends

Semester – 3

SEC-3

Credits: 03	1 credit=15hrs	F.M.-75	E.S.E.-75	Time-3hrs
	30 lectures & 15 tutorials	P.M.-30	S.I.E.-....	

Unit 1: <u>Logic</u>: Logical Connectives and Tautologies, Implications/Conditional statements, Converse statement, positive statement, Validating statement.   2 questions

Unit 2: <u>Mathematical Induction</u>: Introduction, Motivation, The Principle of Mathematical Induction, Progression: Elementary idea of A.P., G.P., and H.P.   2 questions

Unit 3: <u>Statistics</u>: Measures of Skewness, Correlation, Probability Theory: Meaning and Definitions, Probability Theorems: Additional Theorem, Multiplication Theorem, Theorem of Conditional Probabilities.   2 questions

Books Recommended:

(1)Mathematical and Computational Thinking and Analysis: Dr. R. K. Tiwary, Dr.Y. K. Mishra & Dr. B. N. Gupta

(2)Probability and Statistics: Morris H, Degroot

(3) Arithmetic by Lalji Prasad published by Student Friends

Question format

General Instructions:

(1)Group A carries very short answer type compulsory questions.

(2)Answer 4 out of 6 subjective/descriptive questions given in Group B.

(3) Answer in your own words as far as practicable.

(4) Answer all sub parts of a question at one place.

(5) Numbers in right indicate full marks of the question.

Group A

1.   [5x1=5]

  I.

 II.

III.

IV.

 V.

2.   [5]

3.   [5]

Group B

4.   [15]

5.   [15]

6.   [15]

7.   [15]

8.   [15]

9.   [15]

Note: There may be subdivision in each question asked in theory Examination.