

Krantiguru Shyamji Krishna Verma

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Mundra Road

BHUJ : 370 001



SYLLABUS (CBCS)

B. Sc. Semester V

MATHEMATICS

CODE: CEMT 507

With effect from June 2018

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KSKV Kachchh University, Bhuj - Kachchh
Syllabus of Mathematics for CBCS Semester V

Name of the Paper : Abstract Algebra I

Paper No. : CEMT-507

Unit 1

[15 marks]

Groups, Examples of groups, Elementary properties of a Group, Order of a group, Subgroups, Necessary and sufficient conditions for a subgroup, Intersection of subgroups, Relation $a \equiv b \pmod{H}$.

Unit 2

[15 marks]

Cosets, Relation between equivalence class of element and the coset, Lagrange's theorem and applications, Permutations, cycles, transpositions, permutation groups, expressing a permutation as a product of transpositions, Even and Odd permutations.

Unit 3

[15 marks]

Normal subgroups, Quotient groups, Group tables for quotient groups, Group Isomorphisms, Automorphisms.

Unit 4

[15 marks]

Cyclic groups and their properties, Subgroups of a cyclic group, Group Homomorphisms, Properties of Homomorphism, Kernel of a homomorphism, First fundamental theorem of homomorphism

❖ **Reference Books :**

1. Dr. I. H. Sheth, "Abstract Algebra", Published by Prentice Hall of India
2. Bhattacharya P.B., Jain S.K. and Nagpal S.R., "Basic Abstract Algebra", Foundation books, New Delhi.
3. Fraleigh J. B., "A First Course in Abstract Algebra", Narosa Publishing, New Delhi
4. Gallian J.A., "Contemporary Abstract Algebra", Narosa Publishing House, New Delhi
5. Herstein I.N., "Topics in Algebra", Vikas Publishing, New Delhi

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SYLLABUS (CBCS)

B. Sc. Semester V

MATHEMATICS

CODE : CEMT-508

With effect from June 2018

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KSKV Kachchh University, Bhuj - Kachchh**Syllabus of Mathematics for CBCS Semester V****Name of the Paper: Mathematical Analysis****Paper No. : CEMT-508****Unit 1 [15 marks]**

Prerequisites: Sets & operations on sets, Functions & their Properties.

Countable sets, Uncountable sets, Real valued Functions, Bounded subsets of \mathbb{R} .

Unit 2 [15 marks]

Sequences of real numbers, subsequence, Limit of sequence, Convergent sequences, Divergent sequences, Bounded sequences, Monotonic sequences, Operation on convergent sequences, Bolzano - Weierstrass Theorem (only statement), Cauchy sequences.

Unit 3 [15 marks]

Metric spaces- definition and examples, Limits of sequences in Metric space, Bounded sets in metric space, Limits of Functions in metric spaces (only definition), Continuous functions on metric spaces, open sets in metric spaces, Closed sets in metric spaces.

Unit 4 [15 marks]

Complete metric spaces, Properties of complete metric spaces, totally Bounded sets, Compact metric spaces, continuous functions on compact metric spaces.

The course is covered by : “A First course in mathematical Analysis” by D.Somasundaram, B.Choudhary (Narosa Publishing House).

Unit 1 (prerequisites) chapter: 1, Art. 1.1, 1.2

Chapter: 1, Art. 1.3, Art. 1.4 (up to thm: 7) Art 1.5, 1.6

Unit 2 chapter: 2, Art. 2.1 to 2.8, 2.10, 2.11

Unit 3 chapter: 5, Art. 5.1, 5.2, 5.4, 5.5, Art. 5.6 (In this article, only Defn. 1, Defn. 2), Art. 5.7 (omit Thm. 3 and Thm. 4), Art. 5.8

Unit 4 chapter: 6, Art 6.1, 6.2, Art 6.3 (omit thm 3), Art 6.4 (upto thm 4), Art 6.5 (up to thm 6), The theorems with proof : Art 1.3 (thm 1, 2), Art 1.4 (thm 4, 7), Art. 1.5 (thm 1), Art 1.6 (thm 1, 3, 4), Art 2.3 (thm 1), Art 2.6 (thm 1), Art 2.7 (thm 1), Art 2.8 (thm 1), Art 2.11 (thm 1), Art 5.2 (thm 1), Art 5.7 (thm 2), Art 6.2 (thm 1), Art 6.5 (thm 1).

Rest of the theorems' statements are to be discussed thoroughly.

❖ **Reference Books:**

1. Fundamental of Mathematical Analysis -G.Das, S.Pattanayak
2. Principles of Mathematical Analysis -Walter Rudin
3. Mathematical Analysis - T.M.Apostol.

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SYLLABUS (CBCS)

B. Sc. Semester V

MATHEMATICS

CODE : CEMT-509

With effect from June 2018



KSKV Kachchh University, Bhuj - Kachchh

Syllabus of Mathematics for CBCS Semester V

Name of the Paper: Operations Research I

Paper No. : CEMT-509

Unit 1

Theoretical Background: Introduction to Operations Research, Formulation of LPP:
Examples on Production, Marketing, Finance, transportation.
Examples of Graphical Method

Unit 2

Examples of Simplex Method to find the solution of the LPP

Unit 3

Examples of Two phase method to find the solution of the LPP
Examples of Big – M method to find the solution of the LPP

Unit 4

Dual of an LPP (Examples to find the dual of a given LPP), Examples of Dual Simplex Method

❖ Reference Books :

1. Operations Research (Theory and Applications), J. K. Sharma, Third Edition, Published by MACMILLAN INDIA LTD.
2. Mathematical Models in Operation Research by J. K. Sharma-McGraw Hills
3. Linear Programming By G. Hadley- Narosa Publishing House.