KRANTIGURU SHYAMJI KRISHNA VERMA KACHCHH UNIVERSITY

Faculty of Science

B. Sc. Semester III & IV

(Exit option)

MATHEMATICS

SYLLABUS (CBCS)

Curriculum as per UGC Guideline Framed according to National Education Policy (NEP) - 2020

With effect from June – 2024

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KSKV Kachchh University: BHUJ

B.Sc.: Semester: III (THREE) SUBJECT: MATHEMATICS
PAPER: Advanced Calculus – I
PAPER Code: MAJ MAT-301/MDC MAT - 307
(3 Credits)

Unit 1

Limits of real functions of two variables (only examples using definition), Iterated limits, Continuity of functions of two variables (only examples)

Unit 2

Partial Derivatives of first order (only examples – usual and by using definition), Directional Derivatives Partial Derivatives of second order (only examples)

Unit 3

Partial Derivatives of second order (only examples– usual and by using definition)

❖ **Reference Books :**

1. Advanced Calculus: David Widder (Prentice-Hall, inc)
2. Differential Calculus: Shanti Narayan (S. Chand & Co)
3. Integral Calculus: Shanti Narayan (S. Chand & Co)
4. Advanced Calculus Vol. 2 : Tom Apostol (published by John Wiley & Sons)

KSKV Kachchh University: BHUJ
B.Sc.: Semester: III (THREE) SUBJECT: MATHEMATICS
PAPER: Advanced Calculus – I - Practical
PAPER Code: MAJ MAT-302 -P/ MDC MAT-308-P
(1 Credit)

Practical No.	Description
1	Prepare a PPT on a renowned Mathematician
2	Prepare a PPT on a Mathematical topic
3	Prepare a PPT on student's Institute
4	Prepare a PPT on a selected Book
5	Prepare a PPT on Kachchh
6	Prepare a PPT on favourite role model
7	Prepare a PPT on a topic of student's choice
8	Prepare a PPT on a topic of student's choice

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Note: This list is demonstrative and institute can apply necessary changes in content and design of practical as per the availability of infrastructure and need of the students and requirement of skills in the region.

Preferable Infrastructure Requirement: A well-equipped computer lab with licensed Microsoft office.

Human resource requirement: A lab in-charge with good computer knowledge preferably PGDCA, BCA required for computer lab.

KSKV Kachchh University: BHUJ

B.Sc.: Semester: III (THREE) SUBJECT: MATHEMATICS
PAPER: Advanced Calculus – II
PAPER Code: MAJ MAT-303
(3 Credits)

Unit 1

Homogeneous functions, Euler's theorem for Homogeneous functions, Examples of Euler's theorem

Unit 2
Extreme values of real functions of two variables.

Unit 3
Lagrange's Method for Extreme values of real functions of two variables.

- **Reference Books :**

1. Advanced Calculus: David Widder (Prentice-Hall, inc)
2. Differential Calculus: Shanti Narayan (S. Chand & Co)
3. Integral Calculus: Shanti Narayan (S. Chand & Co)
4. Advanced Calculus Vol. 2 : Tom Apostol (published by John Wiley & Sons)

KSKV Kachchh University: BHUJ
B.Sc.: Semester: III (THREE) SUBJECT: MATHEMATICS
PAPER: Advanced Calculus – II - Practical
PAPER Code: MAJ MAT-304 - P
(1 Credit)

Practical No.	Description
1	Basic of C programming.
2	Write a programme of Arithmetic Operations on int Data type and on float Data type in C programming and run it.
3	Write code of Mathematical Formulae in C programming.
4	Write a programme of Hierarchy of Operators and ASCII values using Character data type in C programming.
5	Write Coding of 'If -Else' statement in C programming and run it.
6	Write coding of Multiple conditions 'IF - ELSE' statement in C programming.
7	Write code of 'NESTED IF - ELSE' statement in C programming.
8	Write code of ' ELSE - IF' statement in C programming.

Note: The preferable and recommended software for above practical is **Microsoft Visual Studio** because it offers wide applications.

❖ **Reference books:**

1. Let Us C: Authentic Guide to C programming Language: Yashavant Kanetkar
2. Computing Fundamentals and C programming: E. Balgurusamy
3. C Programming for Beginners: Dr, Madhav Bokare and Ms. Nishigandha Kurale

Note: This list is demonstrative and institute can apply necessary changes in content and design of practical as per the availability of infrastructure and need of the students and requirement of skills in the region.

Preferable Infrastructure Requirement: A well-equipped computer lab with MATLAB or equivalent.

Human resource requirement: A lab in-charge with good computer knowledge preferably PGDCA, BCA required for computer lab.

KSKV Kachchh University: BHUJ
B.Sc.: Semester: III (THREE) SUBJECT: MATHEMATICS
PAPER: Linear Algebra – I
PAPER Code: MAJ MAT-305
(3 Credits)

Unit 1

Prerequisite (Sets, Binary operation, Group, Field)Vector spaces, properties of vector space, subspace of a vector space, Linear combination of vectors, linear span of a set, Linear dependence and linear independence of vectors.

Unit 2

Basis of a vector space, Finite – dimensional vector space, Dimension of a vector space, coordinates of a vector, Dimension Theorem of subspace, linear and direct sum of subspace.

Unit 3

Linear Transformation, vector space isomorphism, Range, rank, kernel and nullity of a linear Transformation, Rank – Nullity theorem, singular and non-singular linear Transformation, The space L(U, V), composition of linear Transformations.

- **Reference Books :**

1. An introduction to Linear Algebra: V. Krishnamurthy

2. SurekhBijganit (in gujarati): Dr. I. H. Sheth

3. Linear Algebra: G Paria.

4. Linear Algebra: A.R.Vasistha

KSKV Kachchh University: BHUJ
B.Sc.: Semester: III (THREE) SUBJECT: MATHEMATICS
PAPER: Linear Algebra – I - Practical
PAPER Code: MAJ MAT-306 - P
(1 Credit)

Practical No.	Description
1	Basics of 'FOR LOOP' in C programming.
2	Write a code for LOOP without using Mathematical formulae in C programming.
3	Write a code for 'BREAK statement' in C programming.
4	Write a code for 'CONTINUE statement' in C programming.
5	Write a code for 'WHILE LOOP' in C programming.
6	Write a code for 'INFINITE LOOP' in C programming.
7	Write a code for Post / Pre - Increment / Decrement operators in C programming.
8	Write a code for 'DO WHILE LOOP' in C programming.

Note: The preferable and recommended software for above practical is **Microsoft Visual Studio** because it offers wide applications.

- **Reference books:**

1. Let Us C: Authentic Guide to C programming Language: Yashavant Kanetkar
2. Computing Fundamentals and C programming: E. Balgurusamy
3. C Programming for Beginners: Dr, Madhav Bokare and Ms. Nishigandha Kurale

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Preferable Infrastructure Requirement: A well-equipped computer lab with **Microsoft Visual Studio** or equivalent.

Human resource requirement: A lab in-charge with good computer knowledge preferably PGDCA, BCA required for computer lab.