SAURASHTRA UNIVERSITY
RAJKOT.

New Syllabus of B.Sc. Semester-3
According to Choice Based Credit System
from June - 2011

(New Syllabus Effective from June - 2017)

• **Program:**	**B.Sc.**
• **Semester:**	**3**
• **Subject:**	**Mathematics**
• **Course code:**	**03 (A)-Theory**
• **Title of Course:**	**Real Analysis**
• **Section-wise Distribution of Marks for External Examination:**	**Total Marks →70 Marks**
• **Segment-wise Distribution of Marks for Internal Examination:**	**Assignments → 10 Marks** **QUIZ test →10 Marks** **Internal exam. → 10 Marks** **Total Marks →30 Marks**
• **Credit Of The Course**	**4 Credits**

SAURASHTRA UNIVERSITY, RAJKOT

B.Sc. SEMESTER -3 (CBCS)

MATHEMATICS PAPER- 03 (A) Theory

Real Analysis

[70 Marks/ $2\frac{1}{2}$ Hours]

UNIT 1: Sequences [14 MARKS]

Definition of a sequence, Bounded sequences, Convergence of a sequence, Limit point of a sequence, Limits Inferior and Superior, Bolzano-Weierstrass Theorem, Convergent sequences, Cauchy's sequence, General principle of convergence of sequence, Algebra of sequences, Subsequence, Monotonic sequences, Some important sequences including $\left\{\sqrt[n]{n}\right\}; \left\{\frac{a_1 + a_2 + ... + a_n}{n}\right\}$

Unit 2: Infinite Series [14 MARKS]

Series of non-negative terms, Geometric series, p-test, Comparison test, Cauchy's Root test, D'Alembert's Ratio test, Raabe's test, Logarithmic Test, Alternating series. (All the tests without proof).

UNIT 3: Vector Differentiation [14 MARKS]

Vector point functions and Scalar point functions, Vector Differentiation, Laplace operator, Laplace equation, Gradient, Divergence and Curl.

UNIT 4: Multiple Integral [14 MARKS]

Double and triple integrals, Application of double and triple integration as area and volume, Change of variable by Jacobian, Change of variables from Cartesian to polar co-ordinates and triple integration in spherical co-ordinates and cylindrical co-ordinates.

UNIT 5: Vector Integration & Beta & Gamma Functions [14 MARKS]

Line integral and Green's theorem & its application to simple problems, Surface integral, Volume Integral, Statement of Divergence theorem(Gauss) & its application to simple problems and Statement of Stoke's theorem & its application to simple problems. Beta and Gamma functions and relation between them. Value of $\int_{-\infty}^{\infty} e^{-x^2} dx$ as gamma function, Duplication formula. Legendre's Formula(without proof).

Notes:

- There shall be **SIX** periods of 55 minutes per week for Mathematics- **03 (A)-Theory.**
- There shall be one question paper of 70 marks & $2\frac{1}{2}$ hours for Mathematics- **03 (A)-Theory**

Format of Question Paper

- Question Paper will be of **70 Marks** with the following type of **FIVE questions** covering the whole syllabus in equal weight-age, **each of 14 marks**.
- There will be one question of 14 marks from each of the 5 units
- Question 1, 2, 3, 4, and 5 will cover unit 1, 2, 3, 4, and 5 respectively.

Question no.	(a)	Attempt all FOUR each of ONE mark	4 Marks
	(b)	Answer any ONE out of TWO	2 Marks
	(c)	Answer any ONE out of TWO	3 Marks
	(d)	Answer any ONE out of TWO	5 Marks
		TOTAL	**14 MARKS**

TEXT BOOKS:-

1. S. C. Malik and Savita Arora, Mathematical Analysis, New Age International(P) Ltd, Publishers, 2nd Edition.
2. Narayan Shanti and Mittal P.K., Integral Calculus, S. Chand & Sons.

REFERENCE BOOKS:-

2. Shantinarayan, A course of Mathematical Analysis, S. Chand & Sons.
3. Richard R. Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi.
4. Walter Rudin, Principle of Mathematical Analysis, MC Graw-Hill Book & Company, 2nd Edition.
5. Differential Calculus by Shanti Narayan, S.Chand & co., New Delhi
6. Differential Calculus by Gorakhprasad, Pothishala Pvt. Ltd., Allahabad
7. Real Analysis by R.R. Goldberg, Oxford and I.B.H. Publishing Co. Pvt. Ltd.
8. S. C. Malik, Principles of Real Analysis, New Age International (P) Ltd, Publishers, 2nd Edition.

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Syllabus of B.Sc. Semester-3
According to Choice Based Credit System
Effective from June – 2011
(New Syllabus Effective from June - 2017)

• **Programme:**	**B.Sc.**
• **Semester:**	**3**
• **Subject:**	**Mathematics**
• **Course code:**	**03(B) (Practical)**
• **Title of Course:**	**Numerical Methods**
• **Total Marks of External Practical Examination:**	**35 Marks**
• **Total Marks of Internal Practical Examination:**	**15 Marks** **Continuous internal assessment of practical work**
• **Total Marks of Practical Examination:**	**External →35 Marks** **Internal →15 Marks** **Total → 50 Marks**
• **Credit Of The Course**	**3 Credits**

SAURASHTRA UNIVERSITY, RAJKOT

B.Sc. SEMESTER -3 (CBCS)

MATHEMATICS PAPER-03(B) (Practical)

Numerical Methods

[50 Marks / 3Hours]

Pr. No. (1) Solution of algebraic and transcendental equation by Graphical method
Pr. No. (2) Solution of algebraic and transcendental equation by Bisection method
Pr. No. (3) Solution of algebraic and transcendental equation by False position method (Regula Falsi Method)
Pr. No. (4) Find all asymptotes for given curve
Pr. No. (5) Solution of algebraic and transcendental equation by Iteration method
Pr. No. (6) Solution of algebraic and transcendental equation by Newton-Raphson's method
Pr. No. (7) Applications of Newton-Raphson's method
Pr. No. (8) Transformation of equation
Pr. No. (9) Derivatives of a polynomial by synthetic division method
Pr. No. (10) Horner's method for solving polynomial equation.
Journal and viva

Notes :

- There shall be **SIX** periods of **1 hour** per week per batch of **15** students.
- **10** practical should be done during semester-**3.**
- At the time of examination candidate must bring his/her own practical journal duly certified and signed by **H.O.D.**
- There shall be one question paper of **35 Marks** and **3 Hours** for practical examination
- There shall be 15 marks for Internal Practical Examination
  (i.e. Continuous internal assessment of performance of each student during the practical work.)

Format of Question Paper for Practical Examination (For paper 03(B) & paper 04(B))

Question 1	Answer any THREE out of FIVE	[9+9+9=	27 Marks
Question 2	Journal and Viva:	[	8 Marks
Question 3:	Internal Practical Examination	[	15 Marks
	TOTAL	**[**	**50 Marks**