

# Gujarat University



## **National Education Policy-2020**

**Syllabus for B. Sc. Sem-I (Mathematics)**

**Effective from June-2023**

**Subject Code For UG Science Courses: -MAT**

<b>Semester</b>	<b>Discipline Specific Courses - Core (DSC - C)</b>	<b>Minor (DSC - M)</b>	<b>Multi / Inter disciplinary courses (MDC / IDC)</b>	<b>Ability Enhancement Courses (Language) (AEC)</b>	<b>Enhancement Courses / Internship / Dissertation Skill</b>	<b>Common Value Added Courses (VAC / IKS)</b>	<b>Total Credits</b>
I	DSC - C - MAT - 111T : 4 DSC - C - MAT - 112P : 4	DSC - M - MAT - 113T : 2 DSC - M - MAT - 113P : 2	MDC - MAT - 114T : 2 MDC - MAT - 114P : 2	AEC - 115 : 2	SEC - 116 : 2	IKS - 117 : 2	22
II	DSC - C - MAT - 121T : 4 DSC - C - MAT - 122P : 4	DSC - M - MAT - 123T : 2 DSC - M - MAT - 123P : 2	MDC - MAT - 124T : 2 MDC - MAT - 124P : 2	AEC - 125 : 2	SEC - 126 : 2	VAC - 127 : 2	22
III	DSC - C - MAT - 231T : 4 DSC - C - MAT - 232T : 4 DSC - C - MAT - 233P : 4	-	MDC - MAT - 234T : 2 MDC - MAT - 234P : 2	AEC - 235 : 2	SEC - 236 : 2	IKS - 237 : 2	22
IV	DSC - C - MAT - 241T : 4 DSC - C - MAT - 242T : 4 DSC - C - MAT - 243P : 4	DSC - M - MAT - 244T : 2 DSC - M - MAT - 244P : 2	-	AEC - 245 : 2	SEC - 246 : 2	VAC - 247 : 2	22
V	DSC - C - MAT - 351T : 4 DSC - C - MAT - 352T : 4 DSC - C - MAT - 353P : 4	DSC - M - MAT - 354T : 4 DSC - M - MAT - 355P : 4	-	-	SEC - 356 : 2	-	22
VI	DSC - C - MAT - 361T : 4 DSC - C - MAT - 362T : 4 DSC - C - MAT - 363P : 4	DSC - M - MAT - 364T : 2 DSC - M - MAT - 364P : 2	-	AEC - 365 : 2	Internship - 4	-	22
VII	DSC - C - MAT - 471T : 4 DSC - C - MAT - 472T : 4 DSC - C - MAT - 473P : 4	DSC - M - MAT - 474T : 2 DSC - M - MAT - 474P : 2	-	-	-	OJT / RP - 6	22
VI	DSC - C - MAT - 481T : 4 DSC - C - MAT - 482T : 4 DSC - C - MAT - 483P : 4	DSC - M - MAT - 484T : 2 DSC - M - MAT - 484P : 2	-	-	-	OJT / RP - 6	22

## Syllabus for B.Sc. Semester – I (MATHEMATICS)

### Course: DSC - M - MAT - 113T: CALCULUS – I

**Credit: 2**

#### UNIT I

- (a) Successive Derivatives, Standard results for  $n$  derivative, Leibniz's theorem.
- (b) Taylor's and Maclaurin's theorems, Using Taylor's and Maclaurin's theorems find power series of various functions.

#### UNIT II

- (a) Differential Equations of First order and First Degree:  
Variable Separable, Homogeneous & non – homogeneous Differential Equations, Exact Differential Equations, Integrating factors, Linear Differential Equations of First order and First Degree, Bernoulli's Differential Equations.
- (b) Method of solving Differential Equations of First order and higher degree:  
Solvable for  $y$ , Solvable for  $x$ , Solvable for  $p$ , Clairaut's Differential Equation, Lagrange's Differential Equation.

#### Reference Books:

- 1) Calculus and Analytic Geometric – G. B. Thomas & R. L. Finney. Pearson Education. Indian Reprint
- 2) Calculus – James Stewart, Sixth Edition (E -Book)
- 3) Calculus - T. M. Apostol. Volume – I
- 4) Differential Calculus – Shanti Narayan, P. K. Mittal, S. Chand & Co
- 5) Differential Calculus – Harikishan, Atlantic Publishers
- 6) Calculus – M. Spivak
- 7) Mathematical Analysis –S C Malik & Savita Arora, Second Edition, New Age Int. (P) Ltd
- 8) Differential Calculus – Shanti Narayan
- 9) Calculus – James Stewart

## **Syllabus for B.Sc. Semester – I (Mathematics Practical)**

**Course: DSC - M - MAT - 114P: CALCULUS – I**

**Credit: 2**

**UNIT I:** Problems based -Successive Derivative, Leibniz's theorem.

**UNIT II:** Problems on solving differential equations

### **Reference Books:**

- 1) Calculus and Analytic Geometric – G. B. Thomas & R. L. Finney. Pearson Education. Indian Reprint
- 2) Calculus – James Stewart, Sixth Edition (e -Book)
- 3) Calculus - T. M. Apostol. Volume – I
- 4) Differential Calculus – Shanti Narayan, P. K. Mittal, S. Chand & Co
- 5) Differential Calculus – Harikishan, Atlantic Publishers
- 6) Calculus – M. Spivak
- 7) Mathematical Analysis – S. C. Malik & Savita Arora, Second Edition, New Age Int. (P) Ltd
- 8) Differential Calculus – Shanti Narayan
- 9) Calculus – James Stewart

**DSC - M - MAT – 114P B.Sc. Sem-1 (Mathematics Practical: Calculus-I)**  
**List of Practical Problems**

**Unit:- 1**

**Practical-1:** Problems on Successive Differentiation

**Practical-2:** Problems on finding  $n^{\text{th}}$  derivative of the functions by using Leibnitz theorem,

**Practical-3:** Problems on applications of Leibnitz theorem.

**Practical-4:** Problems on Successive Derivatives and Leibnitz theorem.

**Practical-5:** Problems on Expansions of infinite power series using Taylor's formula.

**Practical-6:** Problems on Expansions of infinite power series using Maclaurin's formula.

**Unit:- 2**

**Practical-7:** Problems on solving differential equations based on Variable Separable Method

**Practical-8:** Problems on solving Homogeneous Differential equations.

**Practical-9:** Problems on solving Linear Differential equations.

**Practical-10:** Problems on solving Bernoulli's Differential equations.

**Practical-11:** Problems on solving Exact and Non-Exact Differential Equations.

**Practical-12:** Problems on solving First order and Higher degree Differential equations.

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