**Shree Manibhai Virani & Smt. Navalben Virani Science College, Rajkot**

**(Autonomous)**

**Affiliated to Saurashtra University, Rajkot.**

**Department of Mathematics**
**M.Sc. Mathematics**

**SCHEME OF INSTRUCTIONS AND EXAMINATIONS**

**FOR STUDENTS ADMITTED FROM A.Y. 2019-2020 & ONWARDS**

| | Semester – I | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course** | **Hrs of Inst/ week** | | | | **Exam Duration (Hrs)** | **Max Marks** | | | **Credit** |
| | | **Th.** | **Pr.** | **Tu.** | **Total** | | **CIA** | **SEE** | **Total** | |
| **Part –I Core Courses (CC)** | | | | | | | | | | |
| **Core (Theory)** | | | | | | | | | | |
| 19PMTCC101 | **Core 1:** Group and Ring Theory | 4 | - | - | 4 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC102 | **Core 2:** Topology | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC103 | **Core 3:** Functions of Several Variables | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC104 | **Core 4:** Theory of Differential Equations | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| **Discipline Specific Elective -Interdisciplinary  (DSE-ID) –I** | | | | | | | | | | |
| 19PMTID101/ 19PMTID102 | Fundamentals of Classical Mechanics  / Industrial Environment Management | 4 | - | - | 4 | 2 | 50 | 50 | 100 | 4 |
| **Core (Practical)** | | | | | | | | | | |
| 19PMTCC105 | **Core Practical 1:** Numerical Methods using  Scilab | - | 6 | - | 6 | 3 | 40 | 60 | 100 | 2 |
| | | | | | 29 | | | | 600 | 22 |
| **Part II: Life Skill Courses** | | | | | | | | | | |
| - | Value Education for Consciousness Development | 1 | - | - | 1 | - | Remarks at the end of Sem – II | | | - |
| - | **CEC-I:** Online*/Professional certification course** (from choices approved by AC) STC | - | - | - | - | - | - | | | - |
| | **Total** | | | | 30 | | | | 600 | 22 |

| Course Code | Course | Hrs of Inst/ week | | | | Exam Duration (Hrs) | Max Marks | | | Credit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Th. | Pr. | Tu. | Total | | CIA | SEE | Total | |

### Semester – II

**Part –I Core Courses (CC)**

**Core (Theory)**

| Course Code | Course | Th. | Pr. | Tu. | Total | Exam Duration (Hrs) | CIA | SEE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|
| 19PMTCC201 | **Core 5:** Advanced Ring Theory and Field Extensions | 4 | - | - | 4 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC202 | **Core 6**: Real Analysis and Measure Theory | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC203 | **Core 7**: Theory of Partial Differential Equations | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC204 | **Core 8**: Advanced Classical Mechanics | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| **Discipline Specific Elective -Interdisciplinary  (DSE-ID) – II** | | | | | | | | | | |
| 19PMTID201/ 19PMTID202 | Data Analysis & Representation using Computer Tools  / Statistical Methods | 4 | - | - | 4 | 2 | 50 | 50 | 100 | 4 |
| **Core (Practical)** | | | | | | | | | | |
| 19PMTCC205 | **Core Practical  2:** Introduction to Latex | - | 6 | - | 6 | 3 | 60 | 40 | 100 | 2 |
| | | | | | 29 | | | | 600 | 22 |
| **Part II: Life Skill Courses** | | | | | | | | | | |
| 19LSVE201 | Value Education for Consciousness Development | 1 | - | - | 1 | - | Remarks | | | 2 |
| **Total** | | | | | 30 | | | | 600 | 24 |

| | | Semester – III | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Course Code | Course | Hrs of Inst/ week | | | | Exam Duration (Hrs) | Max Marks | | | Credit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Th. | Pr. | Tu. | Total | | CIA | SEE | Total | |
| **Part –I Core Courses (CC)** | | | | | | | | | | |
| **Core (Theory)** | | | | | | | | | | |
| 19PMTCC301 | **Core 9:** Complex Analysis | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC302 | **Core 10**: Discrete Mathematics | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC303 | **Core 11**: Advanced Topics in Linear Algebra | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC304 | **Core 12: Self-Study Course:** Quantitative Techniques. | 1 | - | - | 1 | 3 | 40 | 60 | 100 | 4 |
| - | Mini Project | - | - | 8 | 8 | - | - | - | - | 2* |
| **Discipline Specific Elective -Core  (DSE-Core )- I** | | | | | | | | | | |
| 19PMTDC301/ 19PMTDC302 | Financial Mathematics / Quantitative Foundations of Bioinformatics | 4 | - | - | 4 | 2 | 50 | 50 | 100 | 4 |
| **Generic Elective (GE) #** | | | | | | | | | | |
| 19PMTGE301 | **Research Tool:** Introduction to Latex | 2 | - | - | 2 | 3 | 60 | 40 | 100 | 2 |
| 19PMTGE302 | Numerical Methods | | | | | | | | | |
| | | | | | 30 | | | | 600 | 22 |
| **Part – II : Competency Enhancement Courses (CEC)** | | | | | | | | | | |
| 19PMTCE301 | CEC-I: Online**/Professional certification course*** (from choices approved by AC) STC | - | - | - | - | - | | - | | 2 |
| **Total** | | | | | 30 | | | | 600 | 24 |

\*    For students who may Exit after SEM-3

\*\*   Course relevant to Mathematics (MOOC./NPTEL/SWAYAM etc.)

\*\*\* Professional Certificate Courses (NET/SLET/GATE/CCNA/CISCO etc.)

# GE**:**  offered by the department of mathematics.

| Course Code | Course | Hrs of Inst/ week | | | | Exam Duration (Hrs) | Max Marks | | | Credit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Th. | Pr. | Tu. | Total | | CIA | SEE | Total | |

**Semester – IV**

**Part –I Core Courses (CC)**

**Core (Theory)**

| Course Code | Course | Th. | Pr. | Tu. | Total | Exam Duration (Hrs) | CIA | SEE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|
| 19PMTCC401 | **Core13:** Advanced Topics in Number Theory | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC402 | **Core 14:** Functional Analysis | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC403 | **Core 15:** Graph Theory | 3 | - | 2 | 5 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC404 | **Core 16:** Differential Geometry | 4 | - | - | 4 | 3 | 40 | 60 | 100 | 4 |
| 19PMTCC405 | Mini Project | - | - | 7 | 7 | - | 100 | 100 | 200 | 4 |
| **Discipline Specific Elective -Core (DSE-Core )- II** | | | | | | | | | | |
| 19PMTDC401/ 19PMTDC402 | Mathematical Statistics / Mathematical Methods | 4 | - | - | 4 | 2 | 60 | 40 | 100 | 4 |
| | | | | | 30 | | | | 700 | 24 |
| **Part – II : Competency Enhancement Courses (CEC)** | | | | | | | | | | |
| 19PMTCE401 | Writing Summary of a Research paper and Book review | - | - | - | - | - | - | - | 100 | 2 |
| **Total** | | | | | 30 | | | | 800 | 26 |
| **TOTAL OF ALL SEMESTERS** | | | | | | | | | 2600 | 96 |

## TOTAL MARKS AND CREDIT DISTRIBUTION

| S. No | PART | Total Marks | Total Credits |
|-------|------|-------------|---------------|
| 1. | **PART I:** Core, Discipline Specific Elective Courses, Self-study, GE. | 2500 | 90 |
| 2. | **PART II :** | | |
| | Competency Enhancement Course-I | Remarks | 2 |
| | Competency Enhancement Course-II | 100 | 2 |
| | **Life Skill Courses** : Value Education for Consciousness Development | Remarks | 2 |
| | **TOTAL** | **2600** | **96** |

- **Part- I: CORE, DSE CORE**

### CORE COURSES (Theory)

| S. No | Semester | Course Code | Course |
|-------|----------|-------------|--------|
| 1. | I | 19PMTCC101 | Group and Ring Theory |
| 2. | | 19PMTCC102 | Topology |
| 3. | | 19PMTCC103 | Functions of Several Variables |
| 4. | | 19PMTCC104 | Theory of Differential Equations |
| 5. | II | 19PMTCC201 | Advanced Ring Theory and Field Extensions |
| 6. | | 19PMTCC202 | Real Analysis and Measure Theory |
| 7. | | 19PMTCC203 | Theory of Partial Differential Equations |
| 8. | | 19PMTCC204 | Advanced Classical Mechanics |
| 9. | III | 19PMTCC301 | Complex Analysis |
| 10. | | 19PMTCC302 | Discrete Mathematics |
| 11. | | 19PMTCC303 | Advanced Topics in Linear Algebra |
| 12. | | 19PMTCC304 | Self Study Course: Quantitative Techniques. |
| 13. | IV | 19PMTCC401 | Advanced Topics in Number Theory |

| 14. | | 19PMTCC402 | Functional Analysis |
|-----|--|------------|---------------------|
| 15. | | 19PMTCC403 | Graph Theory |
| 16. | | 19PMTCC404 | Differential Geometry |

## CORE COURSES (Practical)

| S. No | Semester | Course Code | Course |
|-------|----------|-------------|--------|
| 1. | **I** | 19PMTCC105 | Numerical Methods using Scilab |
| 2. | **II** | 19PMTCC205 | Introduction to Latex |

- **OTHER CORE COURSES**

| S. No. | Semester | Course Code | Course |
|--------|----------|-------------|--------|
| **1.** | **V &VI** | 19PMTCC405 | Mini Project |

- **DSE Interdisciplinary / Core Interdisciplinary COURSE (Theory & Practical)**
  Students are required to opt for any one of the courses offered in each semester respectively.

| S. No | Semester | Theory | |
|-------|----------|--------|--|
| | | Course Code | Course |
| 1. | I | 19PMTID101 | Fundamentals of Classical Mechanics |
| | | 19PMTID102 | Industrial Environment Management |
| 2. | II | 19PMTID201 | Data Analysis & Representation using Computer Tools |
| | | 19PMTID202 | Statistical Methods |
| 3 | III | 19PMTDC301 | Financial Mathematics |
| | | 19PMTDC302 | Quantitative Foundations of Bioinformatics |
| 4. | IV | 19PMTDC401 | Mathematical Statistics |
| | | 19PMTDC402 | Mathematical Methods |

- **Part- II**

a) **COMPETENCY ENHANCEMENT COURSES**

| S. No | Semester | Course Code | Course |
|-------|----------|-------------|--------|
| 1. | III | 19PMTCE301 | Online/Professional certification course (from choices approved by AC) STC |
| 2. | IV | 19PMTCE401 | Writing Summary of a Research Paper and Book |

| | | | Review |
|---|---|---|---|

## b) LIFE SKILL COURSES

| S. No | Semester | Course Code | Course |
|---|---|---|---|
| 1. | I | - | Value Education for Consciousness Development |
| 2. | II | 19LSVE201 | Value Education for Consciousness Development |

## Generic Elective Courses offered by the department

| S. No | Semester | Course Code | Course |
|---|---|---|---|
| 1. | III | 19PMTGE401 | **Research Tool:** Introduction to Latex |
| 2. | III | 19PMTGE402 | Numerical Methods |