

**SARDAR PATEL UNIVERSITY**  
**NEP Structure B.Sc. Semester: V**  
**(Under Choice Based Credit Scheme)**  
**Syllabus with Effect from: 2025**

| Course Type                    | Course Code | Name of Course                       | T / P | Credit | Contact Hours Per Week | Exam Duration in hrs | Component of Marks |          |       |
|--------------------------------|-------------|--------------------------------------|-------|--------|------------------------|----------------------|--------------------|----------|-------|
|                                |             |                                      |       |        |                        |                      | Internal           | External | Total |
|                                |             |                                      |       |        |                        |                      |                    |          |       |
| Major Course (Any One Subject) |             |                                      |       |        |                        |                      |                    |          |       |
| Chemistry                      | US05MACHE01 | Organic Chemistry-I                  | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MACHE02 | Analytical Chemistry                 | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MACHE03 | Chemistry Practical                  | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Physics                        | US05MAPHY01 | Classical Mechanics                  | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MAPHY02 | Analog and Digital Circuits          | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MAPHY03 | Physics Practical                    | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Zoology                        | US05MAZOO01 | Genetics & Biotechnology             | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MAZOO02 | Ecology and Animal Behaviour         | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MAZOO03 | Zoology Practical                    | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Bio Chemistry                  | US05MABIC01 | Molecular Biology                    | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MABIC02 | Human Metabolism-I                   | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MABIC03 | Biochemistry Practical               | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Botany                         | US05MABOT01 | Microbiology and Phycology           | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MABOT02 | Molecular Biology and Bioinformatics | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MABOT03 | Botany Practical                     | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Biotechnology                  | US05MABTE01 | Enzymology & Metabolism              | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MABTE02 | Fundamentals of Immunology           | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                | US05MABTE03 | Biotechnology Practical              | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |



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|                                   |             |                                                   |       |        |                        |                      | Internal           | External | Total |
| Microbiology                      | US05MAMIC01 | Bacterial Genetics                                | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAMIC02 | Microbial Metabolism                              | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAMIC03 | Microbiology Practical                            | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Industrial Chemistry              | US05MAICH01 | Advance Organic Chemistry                         | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAICH02 | Fluid Mechanics & Mechanical Operations           | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAICH03 | Industrial Chemistry-Practical                    | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Industrial Chemistry (Vocational) | US05MAICV01 | Unit Processes in Organic Synthesis-I             | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAICV02 | Introduction to Organic Chemistry                 | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAICV03 | Practical                                         | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Mathematics                       | US05MAMTH01 | Real Analysis-1                                   | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAMTH02 | Abstract Algebra                                  | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAMTH03 | Mathematical Algorithms with Python-1             | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Electronics and Communication     | US05MAELC01 | Microprocessor Interrupts & Interfacing           | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAELC02 | Analog and Linear Integrated Circuit              | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAELC03 | Electronics and Communication Practical           | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Computer Science                  | US05MACSC01 | Object Oriented Programming Using Java            | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MACSC02 | Relational Database Management System             | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MACSC03 | Practicals                                        | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |
| Electronics                       | US05MAELE01 | 8-Bit Microprocessor Programming & Applications-1 | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAELE02 | Linear Integrated Circuits                        | T     | 4      | 4                      | 2:30                 | 50                 | 50       | 100   |
|                                   | US05MAELE03 | Electronics Practical                             | P     | 4      | 8                      | 3                    | 50                 | 50       | 100   |



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|                                 |             |                                                      |       |        |                        |                      | Internal           | External | Total |
|                                 |             |                                                      |       |        |                        |                      |                    |          |       |
| Minor Subject (Any One Subject) |             |                                                      |       |        |                        |                      |                    |          |       |
| Chemistry                       | US05MICHE01 | Inorganic Chemistry                                  | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MICHE02 | Inorganic Quantitative Analysis Practical            | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MICHE03 | Physical Chemistry                                   | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MICHE04 | Chemistry Practical                                  | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MICHE05 | Petrochemicals                                       | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MICHE06 | Petrochemicals– Practical                            | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MICHE07 | Chemical Process Industries                          | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MICHE08 | Chemical Process Industries – Practical              | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MICHE09 | Industrial Management & Economics – I                | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MICHE10 | Industrial Management & Economics – I – Project Work | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Physics                         | US05MIPHY01 | Thermodynamics                                       | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MIPHY02 | Physics Practical                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MIPHY03 | Renewable Energy Sources                             | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MIPHY04 | Physics Practical                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Zoology                         | US05MIZOO01 | Environmental Biology                                | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MIZOO02 | Zoology Practical                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MIZOO03 | Physiology                                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MIZOO04 | Zoology Practical                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Biochemistry                    | US05MIBIC01 | Enzymology                                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MIBIC02 | Biochemistry Practical                               | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                 | US05MIBIC03 | Fundamentals of clinical Biochemistry                | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                 | US05MIBIC04 | Biochemistry Practical                               | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |



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|                                    |             |                                                       |       |        |                        |                      | Internal           | External | Total |
| <b>Botany</b>                      | US05MIBOT01 | Plant Ecology                                         | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIBOT02 | Botany Practical                                      | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIBOT03 | Biofertilizers                                        | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIBOT04 | Botany Practical                                      | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Biotechnology</b>               | US05MIBTE01 | Clinical Diagnosis                                    | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIBTE02 | Biotechnology Practical                               | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIBTE03 | Food and Dairy Biotechnology                          | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIBTE04 | Food and Dairy Biotechnology Practical                | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Microbiology</b>                | US05MIMIC01 | Methods in Food and Dairy Microbiology                | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIMIC02 | Practical for Methods in Food and Dairy Microbiology  | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIMIC03 | Introduction to Industrial Microbiology               | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIMIC04 | Practical for Introduction to Industrial Microbiology | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Industrial Chemistry</b>        | US05MIICH01 | Petroleum and Petroleum Products                      | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIICH02 | Petroleum and Petroleum Products – Practical          | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIICH03 | Chemical Process Technology                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIICH04 | Chemical Process Technology – Practical               | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIICH05 | Business Organization & Management – I                | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIICH06 | Business Organization & Management – I – Project work | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIICH07 | Fundamentals of Physical Chemistry                    | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIICH08 | Fundamentals of Physical Chemistry Practical          | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                    | US05MIICH09 | Fundamentals of Inorganic Chemistry                   | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIICH10 | Fundamentals of Inorganic Chemistry Practical         | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Industrial Chemistry (Voc.)</b> | US05MIICV01 | Unit Processes                                        | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                    | US05MIICV02 | Practical                                             | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |



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|----------------------------------------|-------------|-------------------------------------------------------------|-------|--------|------------------------|----------------------|--------------------|----------|-------|
|                                        |             |                                                             |       |        |                        |                      | Internal           | External | Total |
| <b>Mathematics</b>                     | US05MIMTH01 | Numerical Analysis-1                                        | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MIMTH02 | Problems and Exercises in Numerical Analysis-1              | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                        | US05MIMTH03 | Ordinary Differential Equations-1                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MIMTH04 | Problems and Exercises in Ordinary Differential Equations-1 | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                        | US05MIMTH05 | Partial Differential Equations-1                            | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MIMTH06 | Problems and Exercises in Partial Differential Equation-1   | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Statistics</b>                      | US05MISTA01 | Elements of Probability Theory                              | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MISTA02 | Statistics Practical                                        | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                        | US05MISTA03 | Time Series Analysis and Statistical Quality Control        | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MISTA04 | Statistics Practical                                        | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Electronics &amp; Communication</b> | US05MIELC01 | Computer Network                                            | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MIELC02 | Electronics and Communication Practical                     | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                        | US05MIELC03 | Optical Fiber Communication                                 | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MIELC04 | Electronics and Communication Practical                     | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Computer Science</b>                | US05MICSC01 | Object Oriented Programming Using C++                       | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MICSC02 | Practicals                                                  | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                        | US05MICSC03 | Computer Networks                                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                        | US05MICSC04 | Practicals                                                  | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |



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|---------------------------------------------------|-------------|--------------------------------------------------------------------------|-------|--------|------------------------|----------------------|--------------------|----------|-------|
|                                                   |             |                                                                          |       |        |                        |                      | Internal           | External | Total |
| Electronics                                       | US05MIELE01 | Digital Electronics – 1                                                  | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05MIELE02 | Electronics Practical                                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                                   | US05MIELE03 | Transistor Amplifiers                                                    | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05MIELE04 | Electronics Practical                                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                                   | US05MIELE05 | 8085 Microprocessor & Programming -1                                     | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05MIELE06 | Electronics Practical                                                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Statistics                                        | US05MISTA01 | Index Numbers and Vital Statistics                                       | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05MISTA02 | Problem Solving in Index Numbers and Vital Statistics                    | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| <b>Skill Enhancement Course (Any One Subject)</b> |             |                                                                          |       |        |                        |                      |                    |          |       |
| Chemistry                                         | US05SECHE01 | Analytical and Physical Chemistry Practical                              | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Physics                                           | US05SEPHY01 | Hands-on Experimental Skills in Physics                                  | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Biochemistry                                      | US05SEBIC01 | Tools and Techniques in Biochemistry-V                                   | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05SEBIC02 | Biochemistry Practical                                                   | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Botany                                            | US05SEBOT01 | Applied Botany                                                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Statistics                                        | US05SESTA01 | Elements of Probability in Biostatistics                                 | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Computer Science                                  | US05SECSC01 | Software Engineering                                                     | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Electronics                                       | US05SEELE01 | Optical Fibers                                                           | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05SEELE02 | Electronics Projects and Troubleshooting                                 | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
| Mathematics                                       | US05SEMTH01 | Numerical Methods (Practical)                                            | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                                   | US05SEMTH02 | Basics of Cryptography                                                   | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Microbiology                                      | US05SEMIC01 | Tools and techniques of r-DNA Technology                                 | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05SEMIC02 | Cultivation of economically important Fungi (Practical)                  | P     | 2      | 4                      | 2                    | 25                 | 25       | 50    |
|                                                   | US05SEMIC03 | Microbes in Agriculture Microbial Fertilizers and Microbial Insecticides | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Zoology                                           | US05SEZOO01 | Animal Rescue, care and Rehabilitation                                   | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Industrial Chemistry                              | US05SEICH01 | Industrial Safety & Hygiene                                              | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05SEICH02 | Industrial Hazards & Management                                          | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
|                                                   | US05SEICH03 | Chemical Engineering Drawing                                             | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |
| Biotechnology                                     | US05SEBTE01 | Molecular Techniques                                                     | T     | 2      | 2                      | 1:30                 | 25                 | 25       | 50    |

