

Progressive Education Society's
**Modern College of Arts, Science and Commerce (Autonomous),
Shivajinagar, Pune 5**

(An Autonomous College Affiliated to Savitribai Phule Pune University)

Framework of Syllabus

For

B. Sc. (Biotechnology)

Choice Based Credit System (CBCS) Syllabus
Under National Education Policy (NEP)

To be implemented from Academic Year 2024-2025

Level:- 4.5 (First Year) Sem:I

| Course Type | Course Code | Course Title | Credits | | Teaching Scheme Hr/Week | | Evaluation Scheme and Max Marks | | |
|---|--------------------------------|-----------------------------------|---------|----|-------------------------|----|---------------------------------|-----|-------|
| | | | TH | PR | TH | PR | CE | ESE | Total |
| Subject 1 T(2)+ (T/P) (2) or T(4) | 24ScBioU1101 | Plant Science | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU1102 | Lab on 24ScBioU1101 | | 2 | | 4 | 20 | 30 | 50 |
| Subject 2 T(2)+ (T/P) (2) or T(4) | 24ScBioU1201 | Chemistry | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU1202 | Lab on 24ScBioU1102 | | 2 | | 4 | 20 | 30 | 50 |
| Subject 3 T(2)+ (T/P) (2) or T(4) | 24ScBioU1301 | Biochemistry | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU1302 | Lab on 24ScBioU1103 | | 2 | | 4 | 20 | 30 | 50 |
| IKS T(2) | 24CpCopU1901 | Generic IKS | 2 | | 2 | | 20 | 30 | 50 |
| GE/OE (T/P) (2) | 24ScBioU1401 | Biotechnology and Human welfare I | 2 | | 2 | | 20 | 30 | 50 |
| SEC (P) (2) | 24ScBioU1601 | Modern Physics | | 2 | | 2 | 20 | 30 | 50 |
| AEC T(2) | 24CpCopU1701 / 24CpCopU1702 | MIL-I (Hindi) / MIL-I (Marathi) | 2 | | 2 | | 20 | 30 | 50 |
| VECT (2) | 24CpCopU1801 | Environmental Science | 2 | | 2 | | 20 | 30 | 50 |
| Total | | | 14 | 08 | 14 | 16 | | | 550 |

Level:- 4.5 (First Year) Sem:II

| Course Type | Course Code | Course Title | Credits | | Teaching Scheme Hr/Week | | Evaluation Scheme and Max Marks | | |
|--------------------------------------|---------------|--------------------------------------|---------|----|-------------------------|----|---------------------------------|-----|-------|
| | | | TH | PR | TH | PR | CE | ESE | Total |
| Subject 1 T(2)+ T/P(2) or T(4) | 24ScBioU2101 | Animal Sciences | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU2102 | Lab Course on 24ScBioU2101 | | 2 | | 4 | 20 | 30 | 50 |
| Subject 2 T(2)+ P(2) | 24ScBioU2201 | Microbiology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU2202 | Lab Course on 24ScBioU2201 | | 2 | | 4 | 20 | 30 | 50 |
| Subject 3 T(2)+ P(2) | 24ScBioU2301 | Biophysics and Instrumentation | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU2302 | Lab Course on 24ScBioU2301 | | 2 | | 4 | 20 | 30 | 50 |
| GE/OE (T/P)(2) | 24ScBioU2401 | Biotechnology and Human welfare II | 2 | | 2 | | 20 | 30 | 50 |
| SEC T(2) | 24ScBioU2601 | Basics of Mathematics and Statistics | 2 | | 2 | | 20 | 30 | 50 |
| AEC T(2) | 24CpCopU2703 | English Communication Skills I | 2 | | 2 | | 20 | 30 | 50 |
| VEC T(2) | 24CpCopU2801 | Democracy, Election and Governance | 2 | | 2 | | 20 | 30 | 50 |
| CC(2) | 24CpCopU2001/ | Physical Education / | 2 | | 2 | | 20 | 30 | 50 |

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|--------------|--|--|----|----|----|----|--|--|-----|
| | 24CpCopU2011 / 24CpCopU2021 / 24CpCopU2031 / 24CpCopU2041 / 24CpCopU2051 / 24CpCopU2061 / 24CpCopU2071 | Cultural Activities / NSS / NCC / Fine Arts / Applied Arts / Visual Arts / Performing Arts | | | | | | | |
| Total | | | 16 | 06 | 16 | 12 | | | 550 |

Level:- 5.0 (Second Year) Sem:III

| Course Type | Course Code | Course Title | Credits | | Teaching Scheme Hr/Week | | Evaluation Scheme and Max Marks | | |
|--|--------------|-------------------------------------|---------|----|-------------------------|----|---------------------------------|----|-------|
| | | | TH | PR | TH | PR | CE | EE | Total |
| Major Core T(2+2 or 4), (T/P)(2) | 24ScBioU3101 | Cell Biology | 4 | | 4 | | 40 | 60 | 100 |
| | 24ScBioU3102 | Lab Course on 24ScBioU3101 | 2 | | 2 | | 20 | 30 | 50 |
| VSC P(2) | 24ScBioU3501 | Immunology | | 2 | | 4 | 20 | 30 | 50 |
| IKS (T/P)(2) | 24ScBioU3901 | Application of IKS in Biotechnology | 2 | | 2 | | 20 | 30 | 50 |
| FP P(2) | 24ScBioU3002 | Field Project I | | 2 | | 4 | 20 | 30 | 50 |
| Minor (T/P)(2+2 or 4) | 24ScBioU3301 | Animal Development and Physiology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU3302 | Lab Course on 24ScBioU3301 | | 2 | | 4 | 20 | 30 | 50 |
| GE/OE (T/P)(2) | 24ScBioU3401 | Biotechnology and Human Welfare III | | 2 | | 4 | 20 | 30 | 50 |
| AEC T(2) | 24CpCopU3703 | English Communication Skills II | 2 | | 2 | | 20 | 30 | 50 |
| CC T(2) | 24CpCopU3001 | Online Course on Yoga | 2 | | 2 | | 20 | 30 | 50 |
| Total | | | 14 | 08 | 14 | 16 | | | 550 |

Level:- 5.0 (Second Year) Sem:IV

| Course Type | Course Code | Course Title | Credits | | Teaching Scheme Hr/Week | | Evaluation Scheme and Max Marks | | |
|--|--------------|----------------------------------|---------|----|-------------------------|----|---------------------------------|----|-------|
| | | | TH | PR | TH | PR | CE | EE | Total |
| Major Core T(2+2 or 4), (T/P)(2) | 24ScBioU4101 | Molecular Biology | 4 | | 4 | | 40 | 60 | 100 |
| | 24ScBioU4102 | Lab Course on 24ScBioU4101 | | 2 | | 4 | 20 | 30 | 50 |
| VSC P(2) | 24ScBioU4501 | Genetics | | 2 | | 4 | 20 | 30 | 50 |
| CEP P(2) | 24ScCopU4003 | Community Engagement Project | | 2 | | 4 | 20 | 30 | 50 |
| Minor (T/P)(2+2 or 4) | 24ScBioU4301 | Plant Development and Physiology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU4302 | Lab Course on 24ScBioU4301 | | 2 | | 4 | 20 | 30 | 50 |

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| GE/OE (T/P) (2) | 24ScBioU4401 | Biotechnology and Human Welfare IV | 2 | | 2 | | 20 | 30 | 50 |
| SEC T(2) | 24ScBioU4601 | Metabolism | | 2 | | 4 | 20 | 30 | 50 |
| AEC T(2) | 24CpCopU4701 / 24CpCopU4702 | MIL-II (Hindi) / MIL-II (Marathi) | 2 | | 2 | | 20 | 30 | 50 |
| CC T(2) | 24CpCopU4001 | Health and Wellness | 2 | | 2 | | 20 | 30 | 50 |
| Total | | | 12 | 10 | 12 | 20 | | | 550 |

Level:- 5.5 (Third Year) Sem:-V

| Course Type | Course Code | Course Title | Credits | | Teaching Scheme Hr/Week | | Evaluation Scheme and Max Marks | | |
|---|--------------|--|---------|----|-------------------------|----|---------------------------------|----|-------|
| | | | TH | PR | TH | PR | CE | EE | Total |
| Major Core T(2+2+2+2 or 4 + 2+2 or 4 + 4) P(2+2 or 4) | 24ScBioU5101 | Microbial Biotechnology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU5102 | Protein Biology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU5103 | Environment Ecology and Biodiversity | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU5104 | Bioinformatics | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU5105 | Lab Course on 24ScBioU5101 & 24ScBioU5102 | | 2 | | 4 | 20 | 30 | 50 |
| | 24ScBioU5106 | Lab Course on 24ScBioU5103 & 24ScBioU5104 | | 2 | | 4 | 20 | 30 | 50 |
| Major Elective (T/P) (2+2 or 4) | 24ScBioU5201 | Nanotechnology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU5202 | Lab Course on 24ScBioU5201 | | 2 | | 4 | 20 | 30 | 50 |
| | 24ScBioU5203 | Plant Tissue Culture | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU5204 | Lab Course on 24ScBioU5203 | | 2 | | 4 | 20 | 30 | 50 |
| VSC P(2) | 24ScBioU5501 | Critical Analysis of Scientific Paper and Scientific Writing | | 2 | | 4 | 20 | 30 | 50 |
| FP (2) | 24ScBioU5001 | Field Project II | | 2 | | 4 | 20 | 30 | 50 |
| Minor (T/P) (2) | 24ScBioU5302 | Lab Course on Applications of Biotechnology | | 2 | | 4 | 20 | 30 | 50 |
| Total | | | 10 | 12 | 10 | 24 | | | 550 |

Level:- 5.5 (Third Year) Sem:-VI

| Course Type | Course Code | Course Title | Credits | | Teaching Scheme Hr/Week | | Evaluation Scheme and Max Marks | | |
|---|--------------|---|---------|----|-------------------------|----|---------------------------------|----|-------|
| | | | TH | PR | TH | PR | CE | EE | Total |
| Major Core T(2+2+2+2 or 4+2+2 or 4+4) P(2+2 or 4) | 24ScBioU6101 | Biophysical and Biochemical Techniques | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU6102 | Agricultural Biotechnology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU6103 | Recombinant DNA Technology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU6104 | Biosafety, Bioethics and IPR | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU6105 | Lab Course on 24ScBioU6101 & 24ScBioU6102 | | 2 | | 4 | 20 | 30 | 50 |

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|---------------------------------------|--------------|--|----|----|----|----|----|----|-----|
| | 24ScBioU6106 | Lab Course on 24ScBioU6103 | | 2 | | 4 | 20 | 30 | 50 |
| Major Elective (T/P) (2+2 or 4) | 24ScBioU6201 | Food Biotechnology | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU6202 | Lab Course on 24ScBioU6201 | | 2 | | 4 | 20 | 30 | 50 |
| | | | | | | | | | |
| | 24ScBioU6203 | Animal Tissue Culture | 2 | | 2 | | 20 | 30 | 50 |
| | 24ScBioU6204 | Lab Course on 24ScBioU5203 | | 2 | | 4 | 20 | 30 | 50 |
| VSC P(2) | 24ScBioU6501 | Lab Course on Molecular Diagnostics | | 2 | | 4 | 20 | 30 | 50 |
| OJT (2) | 24ScBioU6004 | On Job Training | | 4 | | 8 | 40 | 60 | 100 |
| Total | | | 10 | 12 | 10 | 24 | | | 550 |