

Progressive Education Society's

Modern College of Arts, Science and Commerce (Autonomous),

Shivajinagar, Pune 5

(An Autonomous College Affiliated to SavitribaiPhule Pune University)

Framework of Syllabus

For

B.Sc. (Biotechnology)

(Based on NEP 2020 framework)

Semester 1 (First Year)

Course Type	Course	Course code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
Major Mandatory (4 + 2)	Major Paper 1 (Theory)	23ScBIOU1101	Basics of Biotechnology I (Plant sciences and Physics)	4	4	40	60	100
	Major Paper 2 (Practical)	23ScBIOU1102	Lab Course on 23ScBIOU1101	4	2	20	30	50
Major Electives	-							
Minor	-							
OE (2 + 2)	Theory	23ScBIOU1401	Biotechnology and Human welfare I	4	4	40	60	100
	Theory	23CpCopU1402	Democracy, Election and Governance					
VSC (2)	Major Specific Practical I	23ScBIOU1501	Lab Course on Analytical Techniques	4	2	20	30	50
SEC (2)	Skill Paper 1 (Theory)	23ScBIOU1601	Basics of Chemistry and Biochemistry	4	2	20	30	50
AEC(2),	MIL	23CpCopU1701 /23CpCopU1701	MIL (Hindi) / MIL (Marathi)	2	2	20	30	50
VEC (2)	EVS Theory	23CpCopU1801	Environment Science I	2	2	20	30	50
IKS (2)	Generic IKS	23CpCopU1901	Generic IKS	2	2	20	30	50
CC (2)	CC-I Course	23CpCopU1001	Online Course Based on Yoga	2	2	20	30	50
Total				28	22	220	330	550

Semester 2 (First Year)

Course Type	Course	Course code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
Major Mandatory (4 + 2)	Major Paper 3 (Theory)	23ScBIOU2101	Basics of Biotechnology II (Animal Sciences and Microbiology)	4	4	40	60	100
	Major Paper 4 (Practical)	23ScBIOU2102	Lab Course on 23ScBIOU2101	4	2	20	30	50
Major Electives	-							
Minor	Minor Paper I (Theory)	23ScBIOU2301	Applied Biotechnology I (Biophysics and Instrumentation)	2	2	20	30	50
OE (2 + 2)	Theory	23ScBIOU2401	Biotechnology and Human welfare II	4	4	40	60	100
	Theory	23CpCopU2402	Fundamentals of Music					
VSC (2)	Major Specific Practical II	23ScBIOU2501	Practicals in Biophysics and Instrumentation	4	2	20	30	50
SEC (2)	Skill Paper II (Theory)	23ScBIOU2601	Basics of Mathematics and Statistics	4	2	20	30	50
AEC(2),	English Theory	23CpCopU2703	English Communication Skills I	2	2	20	30	50
VEC (2)	EVS Theory	23CpCopU2801	Environment Science II	2	2	20	30	50
IKS (2)	–		–	-	–	–	–	–
CC (2)	CC-II Course	23CpCopU2001 / 23CpCopU2011 / 23CpCopU2021 / 23CpCopU2031 / 23CpCopU2041 / 23CpCopU2051 / 23CpCopU2061 / 23CpCopU2071	Physical Education / Cultural Activities / NSS / NCC / Fine Arts / Applied Arts / Visual Arts / Performing Arts	2	2	20	30	50
Total				28	22	220	330	550

Semester 3 (Second Year)

Course Type	Course	Course code	Course / Paper Title	Hours / Week	Credit	CI A	ESE	Total
Major Mandatory (4 + 4)	Major Core Paper 5 (Theory + Practical)	23ScBIOU3101	Animal Development and Physiology (T + P)	6	4	40	60	100
	Major Paper 6 (Theory)	23ScBIOU3102	Cell Biology	2	2	20	30	50
	Major Paper 7 (Theory) Major Specific IKS	23ScBIOU1901	Application of IKS in Biotechnology	2	2	20	30	50
Major Electives	-							
Minor (4)	Minor Paper II (Theory + Practical)	23ScBIOU3301	Applied Biotechnology II (Immunology) (T + P)	2	4	40	60	100
				4				
OE (2)	Theory	23ScBIOU3401	Biotechnology and Human welfare III	4	4	40	60	100
VSC (2)	Major Specific Practical II	23ScBIOU3501	Lab Course in Cell Structure and Function	4	2	20	30	50
SEC (2)	--		--	--	--	--	--	--
AEC(2),	English Theory	23CpCopU3703	English Communication Skills II	2	2	20	30	50
VEC (2)	--		--	--	--	--	--	--
IKS (2)	--		--	--	--	--	--	--
FP/CEP (2)	FP –I	23ScBIOU3002	Field Project I	2	2	20	30	50
CC (2)	CC-III Course	23CpCopU3001	Fitness	2	2	20	30	50
Total				32	22	220	330	550

Semester 4 (Second Year)

Course Type	Course	Course code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
Major Mandatory (4 + 4)	Major Paper 8 (Theory + Practical)	23ScBIOU4101	Cell and Molecular Biology II (T+P)	2	4	40	60	100
				4				
	Major Paper 9 (Theory + Practical)	23ScBIOU4102	Plant Development and Physiology (T + P)	2	4	40	60	100
				4				
Major Electives	-							
Minor (4)	Minor Paper III (Theory)	23ScBIOU4301	Applied Biotechnology III (Genetics)	4	4	40	60	100
OE (2)		23ScBIOU4401	Biotechnology and Human welfare IV	4	4	40	60	100
VSC (2)	--		--	--	--	--	--	--
SEC (2)	Skill Paper III (Theory)	23ScBIOU4601	Metabolism	2	2	20	30	50
AEC(2)	MIL	23CpCopU4701/ 23CpCopU4702	MIL (Hindi) / MIL (Marathi)	2	2	20	30	50
VEC (2)	--		--	--	--	--	--	--
IKS (2)	--		--	--	--	--	--	--
FP / CEP(2)	CEP –I	23ScBIOU4003	Community Engagement Project I	4	2	20	30	50
CC (2)	CC-IV Course	23CpCopU4001	Health and Wellness	2	2	20	30	50
Total				30	22	220	330	550

Semester 5 (Third Year)

Course Type	Course	Course code	Course / Paper Title	Hours / Week	Credit	CIA	ES E	Total
Major Mandatory (4 + 4 + 2)	Major Core Paper 10 (Theory + Practical)	23ScBioU5101	Microbial Biotechnology (T + P)	2	4	40	60	100
				4				
	Major Paper 11 (Theory + Practical)	23ScBioU5102	Bioinformatics (T + P)	2	4	40	60	100
				4				
	Major Paper 12 (Theory)	23ScBioU5103	Protein Biology	2	2	20	30	50
Major Electives	Elective I (Theory + Practical)	23ScBioU5201	Environment Ecology and Biodiversity (T + P)	2	4	40	60	100
				4				
	Elective II (Theory + Practical)	23ScBioU5202	Nanotechnology (T + P)	2	4	40	60	100
				4				
Minor (4)	Minor Paper IV (Theory + Practical)	23ScBioU5301	Applied Biotechnology IV (Plant Tissue Culture) (T + P)	4	4	40	60	100
OE (2)	--		--	--	--	--	--	--
VSC (2)	Major Specific Practical III	23ScBioU5501	Lab Course on Critical analysis of scientific papers and Scientific Writing	4	2	20	30	50
SEC (2)	--		--	--	--	--	--	--
AEC(2),	--		--	--	--	--	--	--
VEC (2)	--		--	--	--	--	--	--
IKS (2)	--		--	--	--	--	--	--
FP / CEP(2)	FP –II	23ScBIOU5002	Field Project II	4	2	20	30	50
Total				32	22	220	330	550

Semester 6 (Third Year)

Course Type	Course	Course code	Course / Paper Title	Hours / Week	Credit	CIA	ES E	Total
Major Mandatory (4 + 4 + 2)	Major Paper 13 (Theory + Practical)	23ScBioU6101	Biophysical and Biochemical Techniques (T + P)	2	4	40	60	100
				4				
	Major Paper 14 (Theory + Practical)	23ScBioU6102	rDNA Technology (T + P)	2	4	40	60	100
				4				
	Major Paper 15 (Theory)	23ScBioU6103	Bio-safety, Bioethics and IPR	2	2	20	30	50
Major Electives	Elective II (Theory + Practical)	23ScBioU6201	Food Biotechnology (T + P)	2	4	40	60	100
				4				
	Elective II (Theory + Practical)	23ScBioU6202	Agricultural Biotechnology (T + P)	2	4	40	60	100
				4				
Minor (4)	Minor Paper IV (Theory + Practical)	23ScBioU6301	Applied Biotechnology V (Animal Tissue Culture) (T + P)	2	4	40	60	100
				4				
OE (2)	--		--	--	--	--	--	--
VSC (2)	--		--	--	--	--	--	--
SEC (2)	--		--	--	--	--	--	--
AEC(2),	--		--	--	--	--	--	--
VEC (2)	--		--	--	--	--	--	--
OJT (4)	OJT	23ScBioU6004	On job Training	8	4	40	60	100
FP / CEP(2)	--		--	--	--	--	--	--
Total				26	22	220	330	550

OE : Open Elective

AEC: Ability Enhancement Course

VEC: value Education Courses

CC : Co-Curricular Courses

IKS : Indian Knowledge System

OJT : On Job Training

FP : Field Project

VSC : Vocational Skill Courses

CEP : Community Engagement Project

