

*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 . (Mathematics)**

(Based on NEP 2020 framework)

(To be implemented from the Academic Year 2023-24)

### Semester 1 (First Year)

Course Type	Course	Course Code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 2)</b>	Major Paper 1 (Theory)	23ScMat1101	Algebra	2	4	40	60	100
	Major Paper 2 (Practical)	23ScMat1102	Lab Course on 23ScMat1101	4	2	20	30	50
<b>Major Electives</b>	-							
<b>Minor</b>	-							
<b>OE (2 + 2)</b>	Theory	23ScMat1401	Fundamentals of Mathematics	2	4	40	60	100
		23CoCop1402	Democracy, Election and Governance	2				
<b>VSC (2)</b>	Major Specific Practical I	23ScMat1501	Lab course on Logic	4	2	20	30	50
<b>SEC (2)</b>	Skill Paper 1 (Practical)	23ScMat1601	Lab Course on Analytical Geometry	4	2	20	30	50
<b>AEC(2),</b>	MIL Theory	23CpCopU1701 / 23CpCopU1702	MIL-I (Hindi) / MIL-I (Marathi)	2	2	20	30	50
<b>VEC (2)</b>	EVS Theory	23CoCop1801	Environment Science I	2	2	20	30	50
<b>IKS (2)</b>	Generic IKS	23CoCopU1901	Generic IKS	2	2	20	30	50
<b>CC (2)</b>	CC-I Course	23CoCop1001	Online Course Based on Yoga	2	2	20	30	50
<b>Total</b>				26	22	220	330	550

## Semester 2 (First Year)

Course Type	Course	Course Code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 2)</b>	Major Paper 3 (Theory)	23ScMat2101	Calculus	4	4	40	60	100
	Major Paper 4 (Practical)	23ScMat2102	Lab Course on 23ScMat2101	4	2	20	30	50
<b>Major Electives</b>	-							
<b>Minor</b>	Minor Paper I (Practical)	23ScMat2301	Lab Course On Linear Algebra	4	2	20	30	50
<b>OE (2 + 2)</b>	Theory	23ScMat2401	Business Mathematics	2	4	40	60	100
		23CoCop2402	Fundamentals of Music	2				
<b>VSC (2)</b>	Major Specific Practical II	23ScMat2501	Lab Course on Discrete Mathematics	4	2	20	30	50
<b>SEC (2)</b>	Skill Paper II (Practical)	23ScMat2601	Lab Course on Computational Geometry	4	2	20	30	50
<b>AEC(2),</b>	Theory	23CoCop2703	English Communication Skills I	2	2	20	30	50
<b>VEC (2)</b>	EVS Theory	23CoCop2801	Environment Science II	2	2	20	30	50
<b>IKS (2)</b>								
<b>CC (2)</b>	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
<b>Total</b>				<b>30</b>	<b>22</b>	<b>220</b>	<b>330</b>	<b>550</b>

### Semester 3 (Second Year)

Course Type	Course	Course Code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4)</b>	Major Core Paper 5 (Theory)	23ScMat3101	Multivariate Calculus	4	4	40	60	100
	Major Paper 6 (Practical)	23ScMat3102	Lab Course on 23ScMat3101	4	2	20	30	50
	Major Paper 7 (Theory) Major Specific IKS	23ScMatU1901	Ancient Indian Mathematics	2	2	20	30	50
<b>Major Electives</b>	-							
<b>Minor (4)</b>	Minor Paper II (Theory + Practical)	23ScMat3301	Discrete Mathematics ( T + P)	2	4	40	60	100
				4				
<b>OE (2)</b>	Theory	23ScMat3401	Financial Mathematics	2	2	20	30	50
<b>VSC (2)</b>	Major Specific Practical III	23ScMat5101	Lab Course on Computer Oriented Numerical Methods	4	2	20	30	50
<b>SEC (2)</b>	--		--	--	--	--	--	--
<b>AEC(2),</b>	Theory	23CoCop3703	English Communication Skills II	2	2	20	30	50
<b>VEC (2)</b>	--		--	--	--	--	--	--
<b>IKS (2)</b>	--		--	--	--	--	--	--
<b>FP/CEP (2)</b>	FP -I	23ScMat3002	Field Project - I	4	2	20	30	50
<b>CC(2)</b>	CC III	23CoCop3001	Fitness	2	2	20	30	50
<b>Total</b>				<b>28</b>	<b>22</b>	<b>220</b>	<b>330</b>	<b>550</b>

### Semester 4 (Second Year)

Course Type	Course	Course Code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
Major Mandatory (4 + 4)	Major Core Paper 8 (Theory)	23ScMat4101	Linear Algebra	4	4	40	60	100
	Major Paper 9 (Practical)	23ScMat4102	Lab Course on 23ScMat4101& Scilab	8	4	40	60	100
Major Electives	-							
Minor (4)	Minor Paper III (Theory) + Practical)	23ScMat4301	Elementary Calculus (T + P)	2	4	40	60	100
				4				
OE (2)	Theory	23ScMat4401	Basics of Operations Research	2	2	20	30	50
VSC (2)	--		--	--	--	--	--	--
SEC (2)	Skill Paper III (Practical)	23ScMat4601	Lab Course on Vector Calculus	4	2	20	30	50
AEC(2),	Theory	23CoCop4701/ 23CoCop4702	MIL-II (Hindi ) / MIL-II (Marathi)	2	2	20	30	50
VEC (2)	--		--	--	--	--	--	--
IKS (2)	--		--	--	--	--	--	--
FP / CEP(2)	CEP -I	23ScMat4003	Community Engagement Project I	4	2	20	30	50
CC(2)	CC-4	23CoCop4001	Health and Wellness	2	2	20	30	50
<b>Total</b>				<b>28</b>	<b>22</b>	<b>220</b>	<b>330</b>	<b>550</b>

### Semester 5 (Third Year)

Course Type	Course	Course Code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4 + 2)</b>	Major Core Paper 10 (Theory)	23ScMat5101	Real Analysis	4	4	40	60	100
	Major Paper 11 (Theory)	23ScMat5102	Abstract Algebra	4	4	40	60	100
	Major Paper 12 (Practical)	23ScMat5103	Lab Course on 23ScMat5101 & 23ScMat5102	4	2	20	30	50
<b>Major Electives</b>	Elective I (Theory + Practical)	23ScMat5201	Operations Research (T + P)	2	4	40	60	100
				4				
	Elective II (Theory + Practical)	23ScMat5202	Metric Spaces (T + P)	2	4	40	60	100
				4				
<b>Minor (4)</b>	Minor Paper IV (Theory + Practical)	23ScMat5301	Ordinary Differential Equations (T + P)	2	4	40	60	100
				4				
<b>OE (2)</b>	--		--	--	--	--	--	--
<b>VSC (2)</b>	Major Specific Practical IV	23ScMat5501	Lab Course on Latex	4	2	20	30	50
<b>SEC (2)</b>	--		--	--	--	--	--	--
<b>AEC(2),</b>	--		--	--	--	--	--	--
<b>VEC (2)</b>	--		--	--	--	--	--	--
<b>IKS (2)</b>	--		--	--	--	--	--	--
<b>FP / CEP(2)</b>	FP –II	23ScMat5002	Field Project - II	4	2	20	30	50
<b>Total</b>				<b>32</b>	<b>22</b>	<b>220</b>	<b>330</b>	<b>550</b>

### Semester 6 (Third Year)

Course Type	Course	Course Code	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4 + 2)</b>	Major Core Paper 13 (Theory)	23ScMat6101	Complex Analysis	4	4	40	60	100
	Major Paper 14 (Theory)	23ScMat6102	Differential Equations	4	4	40	60	100
	Major Paper 15 (Practical)	23ScMat6103	Lab Course on 23ScMat6101 & 23ScMat6102	4	2	20	30	50
<b>Major Electives</b>	Elective III (Theory + Practical)	23ScMat6201	Number Theory (T + P)	2	4	40	60	100
				4				
	Elective IV (Theory + Practical)	23ScMat62023	Laplace Transforms and Fourier Series (T + P)	2	4	40	60	100
				4				
<b>Minor (4)</b>	Minor Paper V (Theory + Practical)	23ScMat6301	Numerical Methods and its applications (T + P)	2	4	40	60	100
				4				
<b>OE (2)</b>	--		--	--	--	--	--	--
<b>VSC (2)</b>	--		--	--	--	--	--	--
<b>SEC (2)</b>	--		--	--	--	--	--	--
<b>AEC(2),</b>	--		--	--	--	--	--	--
<b>VEC (2)</b>	--		--	--	--	--	--	--
<b>IKS (2)</b>	--		--	--	--	--	--	--
<b>FP / CEP(2)</b>	--		--	--	--	--	--	--
<b>OJT(4)</b>	OJT	23ScMat6004	On Job Training	8	4	40	60	100
<b>Total</b>				<b>32</b>	<b>22</b>	<b>220</b>	<b>330</b>	<b>550</b>

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