॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with'B++' grade

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

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Academic-1 (BOS) Section

website: srtmun.ac.in

E-mail: bos@srtmun.ac.in

शैक्षणिक वर्ष २०२४–२५ पासून लागू केलेल्या विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरणानुसार पदवी प्रथम वर्षाच्या सुधारित (दुरूस्ती) अभ्यासक्रमा बाबत..

..

प रि प त्र क

संदर्भ:– १. जा.क्र.शै–१/एनईपी/विवत्रंविपदवी/२०२४–२५/११२ दिनांक १२/०६/२०२४

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, संदर्भीय परिपत्रकान्वये दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या मा. विद्यापरिषदेच्या बैठकीतील विषय क्र. १५/५९–२०२४ अन्वये मान्यता दिल्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरणानुसार अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्यात आलेले आहेत.

तथापी वरील संदर्भीय परिपत्रका अन्वये प्रकाशित केलेल्या अभ्यासक्रमामध्ये अभ्यासमंडळानी किरकोळ दुरूस्ती करून अभ्यासक्रम सादर केला आहे. मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा यांच्या मान्यतेने खालील दुरूस्ती केलेला अभ्यासक्रम लागू करण्यात येत आहे.

01	B. Sc./B. A. I year Mathematics

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

डॉ. सरिता लोसरवार
सहाय्यक.कुलसचिव
शैक्षणिक अभ्यासमंडळ विभाग

'ज्ञानतीर्थ' परिसर,

विष्णुपुरी, नांदेड – ४३१ ६०६.

जा.क्र.:शैक्षणिक–१/परिपत्रक/एनईपीयुजीदुरूस्ती/S&T/२४९
२०२४–२५/

दिनांक : २३.०८.२०२४

प्रत माहिती व पुढील कार्यवाहीस्तव :

१) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) मा. प्राचार्य, सर्व संबधित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. यानां देवून कळविण्यात येते की, सदरील परिपत्रक विद्यापीठाच्या संकेतस्थळावर प्रसिध्द करण्यात यावे.

SWAMI RAMANAND TEERTH
MARATHWADA UNIVERSITY, NANDED - 431 606

(Structure and Syllabus of Four Years Multidisciplinary Degree Program with Multiple Entry and Exit Option)

BACHELOR OF ARTS/SCIENCE

Major **Mathematics (DSC)**

Under the Faculty of
Science and Technology

Effective from Academic year 2024 – 2025
(As per NEP-2020)

Index

From Desk of Chairman, Board of Studies in the Subject Mathematics

Preamble:

One of the significant reforms in the undergraduate education is to introduce the Learning Outcomes-based Curriculum Framework (LOCF) which makes it student-centric, interactive, and outcome-oriented with well-defined aims, objectives, and goals to achieve. Mathematics is a necessary tool for much of science and engineering. It provides the basic language for understanding the world and gives precision to scientific thought. With the maturing of the Indian industry, there is a large demand for people with strong analytical skills and broad-based background in the mathematical sciences. The curriculum of B.A./B.Sc. Mathematics is structured in such a way that the students acquire in-depth knowledge to perceive the principles of the core subjects like Algebra, Calculus, Analytical Geometry, Differential Equations, Real Analysis, etc are covered exclusively to prepare the students to proceed to the next level of Higher Mathematics of Linear Algebra, Advanced Analysis, Mechanics. A list of varied electives like Operations Research, Graph Theory, Number Theory, Numerical Analysis, Topology, Integral Transform etc are furnished to bridge between the Pure and Applied Mathematics. The comprehensive curriculum design yields an excellent career opportunity in Research, Education, Public and Private Sectors, Business sectors, Banking, IT Industries and in every domain of contemporaries.

The overall aim of B.Sc. Mathematics is to:

- Develop broad and balanced knowledge and understanding of definitions, concepts, principles, and theorems.
- Provide students sufficient knowledge and skills enabling them to undertake further studies in mathematics and its allied areas.
- Create deep interest in learning mathematics.
- Encourage the students to develop a range of generic skills helpful in employment, internships, and social activities.

- Familiarize the students with suitable tools of mathematical analysis to handle issues and problems in mathematics and related sciences.
- Enhance Computational skills and Mathematical reasoning
- Qualify competitive examinations like IIT-IAM, NBHM etc
- Promote and apply mathematics knowledge to do Research/Case Study /Field Project etc.

B.Sc. (Mathematics) Programme Outcomes (POs):

PO1	**Disciplinary Knowledge:** B.A/ B.Sc in Mathematics is the zenith of in-depth knowledge of Algebra, Analysis, Geometry, Calculus and several other branches of mathematics. This also leads to study interdisciplinary areas such as computer science and other allied subjects.
PO2	**Communication Skills:** Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. Skill and Knowledge attained during program will increase the ability to solve real world problems.
PO3	**Digital Proficiency:** The completion of this programme will enable the learner to use appropriate software's to solve mathematical problems
PO4	**Ability to work Independently:** The Learner completing this program will grow the capacity to do work independently.
PO5	**Critical Thinking and Logical Reasoning:** Student will acquire ability of critical thinking and logical reasoning.
PO6	**Mathematical Principles:** students will understand mathematical principles and their applications.
PO7	**Confidence of Learning: The** B.Sc. Programme will develop learners mathematical knowledge and oral, written, and practical skills in a way which will encourage confidence, satisfaction and learning enjoyment.
PO8	**Ability to peruse advanced studies and research**: Students will be motivated high for doing higher education and research in Academically strong institution
PO9	**Skill/Vocational Courses:** Students will have to study skill/Vocational courses related to pure and applied Mathematics.
PO10	**Generic /Open Elective :** As an interdisciplinary approach student will study GE/OE course in Mathematics

Lt. Dr. Mahesh Sahebrao Wavare
Chairman, Board of Studies of the Mathematics
S.R.T. M. U. Nanded

List of Members in Board of Studies (Mathematics)under the faculty of Science and Technology

Sr No	Name of the Member	Designation	Address	Contact Number and Email ID
1	Prof. Lt. Dr. Mahesh Sahebrao Wavare	BoS Chairman (Ad hoc)under Section26(18) and BoS Member under section *40(2)(c)*	Rajarshi Shahu Mahavidyalaya (Autonomous), Latur, Tq. & Dist. Latur.	9890620620 maheshwavare@gmail.com
2	Prof. Dr. Dnyaneshwar Dadaji Pawar	*VC Nominated BoS Member Under Section 40(2)(a)*	Director School of Mathematical Sciences, SRTM University, Nanded	*9423124662* *dypawar@yahoo.com*
3	Dr. B. Surendranath Reddy	*VC Nominated BoS Member Under Section 40(2)(b)(i)*	School of Mathematical Sciences, SRTM University, Nanded	9096077789 surendra.phd@gmail.com bsreddy@srtmun.ac.in
4	Dr. Arun Babarao Jadhav	*VC Nominated BoS Member Under Section 40(2)(b)(ii)*	DSM's College of Arts, Commerce and Science, Parbhani.	7875118707 arunbjadhao@gmail.com
5	Dr. S. S. Handibag	*BoS Member Under Section 40(2)(b)(ii)*	Mahatma Basweshwar Mahavidylaya, Latur	9011491162 960417748 sujitmaths@gmail.com
6	Prof. Dr. Vandeo Chimnaji Borkar	*BoS Member Under Section 40(2)(b)(iii)*	Yeshwant Mahavidyalaya, Nanded	9421769217 borkarvc@gmail.com
7	Dr. Kishor Ramrao Gaikwad,	*BoS Member Under Section 40(2)(b)(iii)*	Science College, Nanded	9923295556 drkr.gaikwad@yahoo.in
8	Dr. Hemant Kishor Undegaonkar,	*BoS Member Under Section 40(2)(b)(iii)*	Bahairji Smarak College, Basmat, Dist. Hingoli	9822546874 hkundegaonkar@gmail.com
9	Dr. S. S. Bellale	*BoS Member Under Section 40(2)(c)*	Dayanand Science College, Latur, Tq. & Dist. Latur – 413512	9405417417 sidhesh.bellale@gmail.com
10	Dr. Ram Govindrao Metkar	*BoS Member Under Section 40(2)(c)*	Indira Gandhi Sr. College, Cidco, New Nanded, Tq. & Dist. Nanded.:	9822312176 rammetkarmath@gmail.com
11	Miss. Jyoti G Narwade	*PG Student*	Pratibha College of Education Kalbhor Nagar Pune	Jyotinarwade790@gmail.com
12	Sukane Sushima Santosh	*UG Student*	C/O Shri Shivaji College Udgir Dist Latur	smusrcollege2007@rediffmail.com

Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science & Technology

Structure for Four Year Multidisciplinary Degree Program with Multiple Entry and Exit

Subject: Mathematics (Major and Minor)

Year & Level	Semester	Optional-1	Optional -2	Optional -3	Generic Elective (GE) (Basket 2) *(Select one each from Group A and B of Basket 2, should not be related to DSC / DSM in col. 3 and 4)*	Vocational & Skill Enhancement Course (V/SEC) *(Related to DSC Mathematics)*	Ability EnhancementCourse (AEC) (Basket 3 for L2) Value Education Courses (VEC) / Indian Knowledge System (IKS) *(Common across faculty)*	Field Work / Project/ Internship/ OJT/ Apprenticeship / Case Study Or Co-curricular Courses (CC) (Basket 4 for CC) *(Common across faculty)*	Credits	Total Credits
1	2	3	4	5	6	7	8	9	10	
	I	SMATCT1101- Topics in Algebra (2Cr) (Theory) SMATCP1102 Lab Course-I (Calculus Using SAGE) (2Cr) (Practical) **(4cr)**	**Other than Mathematics (4cr)**	**Other than Mathematics (4cr)**	GE-1 SMATGE1101 Foundation of Mathematics (2Cr)	SEC SMATSC1101 (2Cr) Basics of MATLAB /Scilab (2cr)	AECENG1101 (2Cr) ACEMIL1101 (MAR/HIN/URD/KAN /PAL)(2Cr) IKSXXX1101 (2Cr) 6 Credits	--	22	44

1 (4.5)	**II**	SMATCT1151 Analytical Geometry (2Cr) (Theory) SMATCP1152 Lab Course-II (Integral Calculus) (2Cr) (Practical) (4cr)	**Other than Mathematics (4cr)**	**Other than Mathematics (4cr)**	GE-2 SMATGE1151 Basic Algebra (2Cr)	SEC SMATSC1151 (2Cr) Programming Using MATLAB/Scilab (2cr)	**AECENG1101 (2Cr) AECMIL1151 (MAR/HIN/URD/KAN/PAL)(2Cr) VECCOI1151 (2Cr) Constitution of India 6 Credits**	**--**	**22**	
***Exit option*: UG Certificate in Major Mathematics on completion of 44 credits** and additional **4 credits from NSQF / Internship**										
2 (5.0)	**III**	SMATCT1201 (3Cr) (Theory) Real Analysis SMATCT1202 (3Cr) (Theory) Group Theory SMATCP1203 (1Cr) (Practical) Lab Course-I(Based on Real Analysis) SMATCP1204 (1Cr) (Practical) Lab Course-II(Based on Group Theory) **8 Credits**	SMATMT1201 Applied Mathematics (1Cr) SMATMP1201 Lab Course on Applied Mathematics (1Cr)		GE-3 SMATGE1201 (2Cr) Quantitative Aptitude and Logical Reasoning (2 credits)	SMATSC1201 (2Cr) Introduction to R Programming **2 Credits**	**AECENG1201 (2cr) AECMIL1201 (2Cr) (MAR/HIN/URD/KAN/PAL) 4 Credits**	**CCCXXX1201(2Cr)** (NCC/NSS/ SPT(sports)/ CLS(Cultural Studies) /HWS (Health Wellness)/ YGE(Yoga Education) / FIT(Fitness) **SMATFP1201 (2Cr) 4Credits**	**22**	**44**
	IV	SMATCT1251 (3Cr) (Theory) Ordinary Differential Equation SMATCT1252 (3Cr) (Theory) Ring Theory SMATCP1253 (1Cr) (Practical) Lab Course-III(Based on ODE) SMATCP1254 (1Cr)	SMATMT1251 Vector Calculus (1Cr) SMATMP1251 Lab Course on Vector Calculus (1Cr)		GE-4 SMATGE1251 (2Cr) Essential Mathematics for Data Science (2 credits)	VSC-1 SMATVC1251 Latex Typesetting 2 Credits	**AECENG1201 (2cr) AECMIL1201 (2Cr) (MAR/HIN/URD/KAN/PAL) VECEVS1251 (2Cr) 6 Credits**	**CCCXXX1251(2Cr) y(NCC/NSS/SPT(sports)/ CLS(Cultural Studies)/HWS(HealthWellness)/ YGE(YogaEducation) / FIT(Fitness) 2 Credits**	**22**	

		(Practical) Lab Course-IV(Based on Ring Theory) **(8 Credits)**								
Exit option: UG Diploma in Major Mathematics and Minor Mathematics on completion of 88 credits and additional **4 credits NSQF / internship in DSC**										
3 **(5.5)**	**V**	SMATCT1301 Metric Space (3Cr) SMATCT1302 Linear Algebra(3Cr) SMATIK1303 Ancient Indian Mathematics (2cr) MATCP1303 (2Cr) Lab Course-V (Based on Metric Space) MATCP1304 Lab Course-VI (Based on Linear Algebra) (2cr) (12 Credits)	**SMATET1301 (3Cr T+1Cr P)** Elective-I: (A)Operation Research (B)Numerical Analysis (C) Any equivalent course from SWAYAM-NPTEL/MOOC **(3T+1P Credits)**	--	--	--	VSC-2 SMATVC1301 (4Cr) Python Programming **(4 Credits)**	--	FP-3/CS-1 SMATHFP1301 / SMATHCS1301 (2Cr) Field Project/ Case Study **2 Credits**	**22**	**44**
	VI	**SMATCT1351 (3Cr)** Complex Analysis **SMATCT1352 (3Cr)** Integral Transform SMATCT1353 Multivariable Calculus (2 Cr) **SMATCP1353 (2Cr)** Lab Course-VII (Based on	**SMATET1351 (3Cr T+1Cr P)** Elective -II (A) Mechanics (B) Topology (C) Any equivalent course from SWAYAM-NPTEL/MOOC **(3Cr T+1Cr P)**	--	--	VSC-3 SMATVC1351 Essential Mathematics for Machine Learning (2cr)	--	SMATOJ1351 (4Cr) **(OJT)** **4 Credits**	**22**	

		Complex Analysis) **SMATCP1353 (2Cr)** Lab Course-VIII (Based on Integral Transform) **(12 Credits)**									
Exit option: Bachelor in Science with Major in Mathematics and Minor in DSM											**130**
4 (6.0)	**VII**	SMATCT1401 (4Cr) Abstract Algebra SMATCT1402 (4Cr) Advanced Calculus SMATCT1403 (4Cr) Complex Analysis SMATCT1404 (2Cr) **Multivariable Calculus Credits** 14	SMATET1401 **(3Cr T+1Cr P)** (A)Mathematical Modeling (B) Dynamics and Continuum Mechanics-I (C) Theory of Probability (D) Any equivalent course from SWAYAM-NPTEL/MOOC **(3Cr T+1Cr P)**	*RM-1 Research Methodology* **SMATRM401** (4Cr) **4 Credits**		--	--	--	--	**22**	**44**
	VIII	SMATCT1451 (4Cr) Linear Algebra SMATCT1452 (4Cr) Measure and Integration Theory SMATCT1453 (4Cr) Topology SMATCT1454 (2Cr) Introduction to Scilab **14 Credits**	SMATET1451 **(3Cr T+1Cr P)** (A) Partial Differential Equation (B) Dynamics and Continuum Mechanics-I I (C) Combinatorics **(3Cr T+1Cr P=4Cr)**	--		--	--	--	SMATOJ451 (4Cr) **(OJT)** **4 Credits**	**22**	

Exit option: Bachelor of Science with Major in MATHS (Honors) and Minor in DSM										**172**
4 (6.0)	**VII**	SMATCT1401 (4Cr) Abstract Algebra SMATCT1402 (4Cr) Advanced Calculus SMATCT1403 (2Cr) Multivariable Calculus **10 Credits**	SMATEC1401 (4Cr) (A)Partial Differential Equations (B) Dynamics and Continuum Mechanics-I (C) Theory of Probability (D) Any equivalent course from SWAYAM-NPTEL/MOOC **4 Credits**	*Research Methodology* **SVECRM1401** (4Cr) **4 Credits**		--	--	--	Research Project **SMATRP1401 (4Cr)**	**22**	**44**
	VIII	SMATCT1451 (4Cr) Linear Algebra SMATCT1452 (4Cr) Topology SMATCT1453 (2Cr) **Introduction to Scilab 10 Credits**	SMATEC1451 (4Cr) (A) Partial Differential Equation (B) Dynamics and Continuum Mechanics-I I (C) Combinatorics **4 Credits**	--		--	--	--	Research Project **SMATRP1451 (8Cr)**	**22**	
Exit option: Bachelor of Science with Major in MATHS (Honours with Research) and Minor in Mathematics										**176**
Total Credits		**Major -92/84**	**Minor1 -12 + RM – 04**	**Minor-2 08**	**GE/OE - 08**	**V-08 + S-06**	**AEC-8 +MIL-08 VEC-4 + IKS-2 Total 22**	**(CC-04+FP/CS-04+OJT-04+RP-12) 24**	**176**	

Basket : Generic Elective course (GE) Structure

Note: ***Generic Elective Courses for semesters I and II***

Sem	BoS	**CODE**	**Credits for Course**	**Open/Generic Elective Corse**	**Nature of Course**
Sem I	BoS in Mathematics	SMATG1101	2 Cr	Foundation of Mathematics	Theory
Sem II	BoS in Mathematics	SMATG1151	2 Cr	Basic Algebra	Theory

B.A./B. Sc. First Year Semester I *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional: Mathematics	SMATCT1101	Topics in Algebra	02	--	**02**	02	--
	SMATCP1102	Lab Course-I Calculus Using SAGE	--	02	**02**	--	04
GE-1	SMATGE1101	Foundation of Mathematics	02	--	**02**	02	--
SEC-1	SMATSC1101	Basics of MATLAB/Scilab	--	02	**02**	--	04
AEC-1	SAECEN1101	Compulsory English	02	--	**02**	02	--
AEC-2	SAECMIL1101	Hin/Mar/Kan/Pali/ Sanskrit/etc.	02	--	**02**	02	--
IKS-1	SVECCI1101	Title from Concern BoS	02	-	**02**	02	--
Total Credits			**10**	**04**	**14**	**08**	**12**

B.A/B. Sc. First Year Semester I *(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

	Course Code (2)	Course Name (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Continuous Assessment (CA)			ESA			
			Test I (4)	Test II (5)	Avg of (T1+T2)/2 (6)	Total (7)	CA (8)	ESA (9)	
Optional: Mathematics	SMATCT1101	Topics in Algebra	10	10	10	40	--	--	50
	SMATCP1102	Lab Course-I Calculus Using SAGE	--	--	--	--	20	30	50
GE-1	SMATGE1101	Foundation of Mathematics	10	10	10	40	--	--	50
SEC-1	SMATSC1101	Basics of MATLAB/Scilab	--	--	--	--	20	30	50
AEC-1	SAECEN1101	Compulsory English	10	10	10	40	--	--	50
AEC-2	SAECMIL1101	Hin/Mar/Kan/Pali/ Sanskrit/etc.	10	10	10	40	--	--	50
IKS-1	SVECCI1101	Title from Concern BoS	10	10	10	40	--	--	50

B.A./B. Sc. First Year Semester II *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional : Mathematics	SMATCT1151	Analytical Geometry	02	--	**02**	02	--
	SMATCP1152	Lab Course-II Integral Calculus	--	02	**02**	--	04
GE-2	SMATGE1151	Basic Algebra	02	--	**02**	02	--
SEC-2	SMATSC1151	Programming Using MATLAB /Scilab	--	02	**02**	--	04
AEC-3	AECENG1101	English Compulsory					
AEC-4	AECMIL1151	Hin/Mar/Pal/Kan/Sanskrit/ etc.	02	--	**02**	02	--
VEC-1	SVECCI1151	Constitution of India	02	-	**02**	02	--
Total Credits			**10**	**04**	**14**	**08**	**12**

B.A./B. Sc. First Year Semester II *(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

Subject (1)	Course Code (2)	Course Name (3)	Theory				Practical		Total [Col (6+7) / Col (8+9)] (10)
			Continuous Assessment (CA)			ESA			
			Test I (4)	Test II (5)	Avg of (T1+T2)/2 (6)	Total (7)	CA (8)	ESA (9)	
Optional : Mathematics	SMATCT1151	Analytical Geometry	10	10	10	40	--	--	50
	SMATCP1152	Lab Course-II Integral Calculus	--	--	--	--	20	30	50
GE-2	SMATGE1151	Basic Algebra	10	10	10	40	--	--	50
SEC-2	SMATSC1151	Programming Using MATLAB /Scilab	--	--	--	--	20	30	50
AEC-3	AECENG1101	English Compulsory	10	10	10	40	--	--	50
AEC-4	AECMIL1151	Hin/Mar/Pal/Kan/Sanskrit/ etc.	10	10	10	40	--	--	50
VEC-1	SVECCI1151	Constitution of India	10	10	10	40	--	--	50

Abbreviations:

1.	DSC	: Discipline Specific Core (Major)
2.	CC/CT	: Core Course /Core Theory(Related Major)
3.	CP	: Core Practical
4.	DSE	: Discipline Specific Elective (Major)
5.	EC /ET	: Elective Course /Elective Theory
6.	EP	: Elective Practical
7.	MC /MT	: Minor Course /Minor Theory
8.	MP	: Minor Practical
9.	DSM	: Discipline Specific Minor
10.	GE/OE	: Generic/Open Elective
11.	VSEC	: Vocational Skill and Skill Enhancement Course
12.	VSC	: Vocational Skill Courses
13.	VC	: Vocational Course
14.	SEC	: Skill Enhancement Course
15.	SC	: Skill Course
16.	AEC	: Ability Enhancement Course
17.	IKS	: Indian Knowledge System
18.	VEC	: Value Education Courses
19.	OJ	: On Job Training
20.	FP	: Field Projects
21.	CC	: Co-Curricular Courses
22.	RP	: Research Project/Dissertation
23.	FP	: Field Project
24.	IP	: Internship Program
25.	CS	: Case Study

26. CLS : Cultural Studies

27. FIT : Fitness

28. HWS : Health and Wellness

29. YGE : Yoga

30. NCC : National Cadet Core

31. NSS : National Service Scheme

32. SPT : Sports

33. MIL : Modern Indian languages

34. RM : Research Methodology

Mathematics Curriculum

B.A. / B.Sc. I (SEMESTER-I)

DSC-1 Topics in Algebra

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type DSC	Semester: I
Prerequisites: Elementary Knowledge of Algebra			
Course Code: SMATCT1101	Course Title: Topics in Algebra		
Course Outcomes: **CO1:** Students can Sort one-one, onto functions and can compute equivalence relation. **CO2:** Students Can compute Composite of functions **CO3**: Student can compute REF, RREF and rank of any ordered matrix **CO4:** Student can solve Linear System of Equation and apply Caley Hamilton Theorem			
Credits: 2	DSC-1		
Max. Marks: 50	Min. Passing Marks:20		
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-0			

Topics in Algebra		
Module	Topic	No of Lectures
I	**Sets Functions and Relations:** Basic terminologies, Operation on set, Cartesian Product of set Relations on sets, Type of relations, Equivalence Relations.	08
II	**Functions:** One-one, onto functions and bijections, Composition of functions, Inverse of functions, Equivalences Classes, Partitions of a Set.	07
III	**Elementary Operations and Rank of Matrix:** Elementary Operations, Equivalent Matrices, Row Rank and Column, Rank of a Matrix, Echelon Form of the Matrix, Row Reduced Echelon Form	07
IV	**System of Linear Equations and Caley Hamilton Theorem:** System Linear Equations (Homogeneous and Non-Homogeneous), Characteristic values, Characteristic vectors, Cayley Hamilton theorem.	08
	Text Books	
1	Ajit Kumar, S. Kumeresan and Bhaba Kumar Sarma, A Foundation Course in Mathematics Narosa Publication House (For Module I and II) **Scope:** Chapter 2 : Article 2.1,2.2,2.5 Chapter 4 : Articles 4.1, 4.2, 4.3 Chapter 3 : Articles 3.1, 3.2, 3.3,3.4 Chapter 4 : Article 4.4	
2	Om P. Chug, Kulbhushan Prakash, A.D.Gupta, Topics in Algebra, Anmol Publications Pvt. Ltd., New Delhi , First Edition 1997 (For Module III and IV) **Scope :**Chapter 11 : Articles : 11.5 to 11.16 Chapter 11 : Articles : 11.32 to 11.39 Chapter 12 : Articles : 12.1. to 12.3, 12.18	
	Reference Books	
1	A text books of matrices, By Shanti Narayan (S. Chand & Company Ltd) Ram Nagar, New Delhi	

2	Seymor Lipschutz, Theory and Problems of linear Algebra, third edition (Tata McGraw Hill)
3	K.B. Datta, Matrix & Linear Algebra, DHI Publication

B.A. / B.Sc. I (SEMESTER-I)

DSC-2: Lab Course -I (Calculus Using SAGE)

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type DSC	Semester: I
Prerequisites: Basic Knowledge of Computer handling			
Course Code: SMATCP1102	Course Title: Lab Course-I (Calculus Using SAGE)		

Course Outcomes:

After successful completion of the course student will be able to

CO1: Do basic programming in Sage

CO2: Do practical's on Calculus

CO3: Know Programming and Data Structures

CO4: Plot 2D, 3D Curve and display solution of differential equation.

Credits: 2	DSC-2
Max. Marks: 50	Min. Passing Marks:20
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-2	

Lab Course-II (Calculus Using SAGE)		
Module	Topic	No of Lectures
I	**Getting to Grips with Sage:** The Sage Program, A Tool for Mathematics, Sage as a Calculator First Computations, Elementary Functions and Usual Constants, On-Line Help and Automatic Completion, Python Variables Symbolic Variables First Graphics	6T+6P
II	**Analysis** : Symbolic Expressions and Simplification, Symbolic Expressions, Transforming Expressions, Usual Mathematical Functions Assumptions, Some Pitfalls, Equations, Explicit Solving, Equations with no Explicit Solution, Analysis, Sums, Limits, Sequences, Power Series Expansions, Series, Derivatives, Partial Derivatives, Integrals.	8T+10P
III	**Programming and Data Structures:** Syntax, General Syntax, Function Calls, More About Variables, Algorithmics, Loops, Conditionals, Procedures and Functions, Example: Fast Exponentiation, Input and Output, Lists and Other Data Structures, List Creation and Access, Global List Operations, Main Methods on Lists, Examples of List Manipulations, Character Strings, Shared or Duplicated Data Structures, Mutable and Immutable Data Structures, Finite Sets, Dictionaries.	7T+8P
IV	**Graphics:** 2D Graphics, Graphical Representation of a Function, Parametric Curve, Curve in Polar Coordinates, Curve Defined by an Implicit Equation, Data Plot, Displaying Solutions of Differential Equations Evolute of a Curve, 3D Curves.	7T+8P
	Text Book	
1	Paul Zimmermann, Nathann Cohen, Alexandre Casamayou, Mathematical Computation with SageMath available from on http://www.sagemath.org, Society for Industrial & Applied Mathematics, U.S. **Scope:**	

	Chapter 1 Chapter 2 :Article 2.1,2.2,2.3 Chapter 3 Chapter 4
	Reference Books
1	Razvan A Mezei, An Introduction to SAGE Programming: With Applications to SAGE Interacts for Numerical Methods, Springer
2	www.sagemath.org
3	Varun Kumar, Basics of SageMath: Mathematics (Practical),Amazon KDP
4	William Granville and David Joyner, Differential Calculus and Sage

List of Practical's

Sr	Title of Practical	Number of Examples
1	Practical on Elementary Functions and Usual Constants	02
2	Practical on Symbolic Variables	02
3	To define symbolic functions and Manipulate expressions	02
4	Practical's on Sums and Sequence	02
5	Practical's on Power series Expansion	02
6	Practical's on Derivatives	02
7	Practical's on Partial Derivatives	02
8	Practical's on Integration	02
9	Practical's on Lists	02
10	Practical's on Data Structures	02
11	Practical's on 2D Plots	03
12	Practical's on 3D Plots	03
13	Practical's on displaying solutions of differential equations	02
14	Practical's on Parametric Curve, Curve in Polar Coordinates,	02

Note: Record book will consist of minimum 30 practical's and examples/Programs may vary college to college and for internal assessment 10 marks for record books and for 10 marks conduct two internal practical examination and take the average of it.

Generic Elective/Open Elective (Basket)

B.A. / B.Sc. I (SEMESTER-I)

GE/OE: Foundation of Mathematics

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type GE/OE For Basket 2	Semester: I
Prerequisites: -- Basic Knowledge of Computations			
Course Code: SMATGE1101	Course Title: Foundation of Mathematics		
Course Outcomes: After Successful completion of this course students can able to **CO1:** Compute distance formula, midpoint formula, equation of lines ,parallel lines and perpendicular lines **CO2:** Find symmetry of graphs **CO3**: Discuss limit and continuity of given function' **CO4:** Apply derivatives to compute maxima and minima			
Credits: 2	GE/OE		
Max. Marks: 50	Min. Passing Marks:20		
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-0			

Foundation of Mathematics		
Module	Topic	No of Lectures
I	**Coordinates Systems and Graphs of Equations:** The coordinate of a point on a line, Absolute value, Coordinate of a point in a plane, Distance formula, Midpoint Formulas, Graphs of equation, Straight line, Slope, Equation of a line, parallel lines, perpendicular lines.	08
II	**Intersection of Graphs, Symmetry and Functions:** Intersection of graphs, Symmetry, Symmetry about a line, Symmetry about a point, Functions and their graphs, Notation of a function, Intervals, Even and Odd functions, Zeros of polynomial.	07
III	**Limit and Continuity:** Limits, Properties of limits, Existence or Non-existence of a limit, One sided limit, Infinite limits, limits at infinity, Continuity, Definition and properties of continuity, One sided continuity, Continuity over a closed interval.	08
IV	**Derivatives and Applications:** The slope of tangent line, Derivative, Differentiability and Continuity, Further rules for derivatives, Maximum and Minimum problems.	07
	Text Book	
1	Elliott Mendelson, Schaum's Outline of Theory and problems of "Beginning Calculus" Second edition, Tata McGraw-Hill publishing company limited. **Scope:** Chapter1: Articles 1.1,1.2 Chapter2: Article 2.1,2.2,2.3 Chapter3: Complete Chapter4: Articles 4.1,4.2,4.3,4.4 Chapter 5: Complete. Chapter6: Articles 6.1,6.2 Chapter7: Articles 7.1,7.2,7.3,7.4 Chapter8: Articles 8.1,8.2,8.3 Chapter9: Articles 9.1,9.2,9.3	

	Chapter 10: Articles 10.1,10.2,10.3 Chapter11: Complete Chapter12: Complete Chapter13: Articles 13.1,13.2 Chapter14: Complete.
	Reference Books
1	Joseph Edwards, "Differential Calculus for Beginners", Arahant publication.
2	George B. Thomas, Jr. And Ross L. Finney Calculus and Analytical Geometry (Pearson)
3	J. H. Heinbockel , Introduction to Calculus
4	P.K Jain. Khalil Ahemad, Textbook of Analytical geometry of two dimension
5	Suggested digital platform: NPTEL/SWAYAM/MOOCs

Skill Enhancement Course

B.A. / B.Sc. I (SEMESTER-I)

SEC- Basics of MATLAB/Scilab

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type SEC	Semester: I
Prerequisites: 1. Basic knowledge of computer operating system			
Course Code: SMATSC1101	Course Title: Basics of MATLAB/Scilab		
Course Outcomes: After successful completion of the course student will be able to **CO1:** Perform basic MATLAB/Scilab commands and will apply MATLAB/Scilab for elementary number theory problem. **CO2:** Do Arithmetic Operations of Arrays **CO3**: Solve elementary linear Algebra examples using MATLAB/Scilab **CO4:** Compute Row Reduced Echelon Form			
Credits: 2	SEC-1		
Max. Marks: 50	Min. Passing Marks:20		
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-2			

Basics of MATLAB/Scilab		
Module	Topic	No of Lectures and Practical's
I	**Introduction to MATLAB/Scilab:** MATLAB Programming language, Built-in Functions, Graphics, computations, External interface, and Tool boxes. MATLAB windows, desktop, command window, workspace, Figure and Editor Windows, Input-output, File types, platform dependence, Printing.	10L+5P
II	**Programming in MATLAB/Silab:** Scripts and functions. Script files, function files: Executing of function, writing good functions, sub functions, compiled functions.	8L+7P
III	**Matrix as array:** Matrices and Vectors, input, indexing, matrix manipulation, creating vectors. Matrix and Array operations, Arithmetic operations, Relational operations, logical operations,	5L +10P
IV	**Linear Algebra and MATLAB/Scilab:** Elementary math functions, matrix functions, character string. finding the determinant, rank, inverse of matrix, Solving Linear system of equations and computation of row reduced echelon form finding eigen-values and eigenvectors.	5L +10P
	Recommended Books/Links	
1	Rudra Pratap ,Getting Started With MATLAB 7, Oxford University Press(For MATLAB User)	
2	Tejas Sheth ,SCILAB: A Practical Introduction to Programming and Problem Solving (Scilab User)	
3	Suggested digital platform: NPTEL/SWAYAM/MOOCs	

4	Amos Gilat ,MATLAB An introduction with applications Wiley India Edition 4th 2012
5	https://spoken-tutorial.org/tutorial-search/?search_foss=Scilab&search_language=English
6	https://nptel.ac.in/courses/103106118
7	S S Alam S N Alam, Understanding Matlab A Textbook For Beginners, Wiley India 2019
8	Dr. Devendra Chouhan, Dr. Uday Dolas ,Basic Programming Concepts of SCILAB, OrangeBooks Publication 2022

List of Practical's

Sr	Title of Practical	Number of Examples
1	To find prime factors of given numbers	02
2	To find greatest common divisor and To generate integer m and n such that gcd(a,b)=ma+nb	02
3	To find Least common multiple of given two numbers	02
4	To generate the list of prime numbers	02
5	To check singularity and non-singularity of a given square matrix	02
6	To find row reduced echelon form	02
7	To find rank of matrix	02
8	To solve given system of linear equations	02
9	To find Characteristic polynomial of a square matrix	02
10	To find eigen values and eigen vectors of a square matrix.	02

Note:

1. MATLAB/Scilab or any freeware suitable software can be used to run these programs.

2.Record book will consist of minimum 20 practical's and examples/Programs may vary college to college and for internal assessment 10 marks for record books and for 10 marks conduct two internal practical examination and take the average of it.

Assessment Scheme for SEC

Course Code (2)	Course Name (3)	Theory				Practical		Total Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg (T1+T2)/2 (6)		CA (8)	ESA (9)	
SMATS1101	Basics of MATLAB/Scilab	--	--	--	--	20	30	50

Mathematics Curriculum (Semester -II)

B.A. / B.Sc. I (SEMESTER-II)

DSC-4: Analytical Geometry

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type DSC	Semester: II
Prerequisites: Elementary knowledge of coordinate axis and XII (Mathematics)			
Course Code: SMATCT1151	Course Title: Analytical Geometry		
Course Outcomes: After successful completion of this course students can able to **CO1:** Study and analyse Geometry of three dimensions. **CO2:** Learners can compute angle between two planes and lines **CO3**: Learners can compute tangent to given Sphere **CO4:** Student can study various forms of Sphere			
Credits: 2	DSC-4		
Max. Marks: 50	Min. Passing Marks:20		
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-0			

Analytical Geometry		
Module	Topic	No of Lectures
I	**Planes:** Direction Cosines and Direction Ratios, Equation of Plane, Normal Form, Transform to the Normal Form, Plane Passing through Three Non-collinear Points, Intercept Form, Angle between Two Planes, Distance of a Point from a Plane, Distance between Parallel Planes, Systems of Planes, Two Sides of Planes, Bisector Planes.	09
II	**Lines in Three Dimension:** Equations of a Line in Symmetric and Unsymmetrical Forms, Line Passing through Two Points, Angle between a line and a Plane. Perpendicular Distance of a Point from a Line.	07
III	**Transformation of Co-ordinates:** Introduction, Change of Origin, Change of Directions of Axes, Relation between the Direction Cosines of Three Mutually Perpendicular Lines, Invariants	07
IV	**Sphere:** Equation of a Sphere in Different Forms, Plane Section of a Sphere, Equation of a Circle, Sphere through a Given Circle, Intersection of a Sphere and a Line, Equation of Tangent Plane to Sphere.	07
Text Books		
1	Shanti Narayan, Analytical Solid Geometry S. Chand and Company Ltd, New Delhi, 1998 Scope :Chapter 1 : Articles 1.6 & 1.7 Chapter 2 : Articles 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7 Chapter 3 : Articles 3.1, 3.2, 3.7 Chapter 5 : Article 5.1, 5.2, 5.3 Chapter 6 : Articles 6.1, 6.2, 6.3, 6.4, 6.5, 6.6	

	Reference Books
1	P.K.Jain and Khalil Ahmad, A Text Book of Analytical Geometry of Three Dimensions, Wiley Estern Ltd. 1999.
2	A text book of Analytical Geometry of two dimensions, By P.K Jain and Khalil Ahmed, (Wiley Eastern Ltd, 1994)
3	A text book of Analytical Geometry of three dimensions, By P. K Jain and Khalil Ahmed, (Wiley Eastern Ltd, 1999.)
4	Suggested digital platform: NPTEL/SWAYAM/MOOCs

B.A. / B.Sc. I (SEMESTER-II)

DSC-5: **Lab Course-II**(Integral Calculus)

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type **DSC**	Semester: II
Prerequisites: Elementary knowledge of integration, partial derivatives and XII (Mathematics)			
Course Code: SMATCP1152	Course Title: Lab Course-II (Integral Calculus)		
Course Outcomes: After Successful completion of this course students can **CO1:** Discuss integral as limit of sum and apply fundamental theorems of Integral Calculus. **CO2:** Study Beta and Gamma Functions. **CO3**: Apply double integration to compute area bounded by region. **CO4:** Study application of Multiple integral.			
Credits: 2	DSC-5		
Max. Marks: 50	Min. Passing Marks:20		
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-2			

Lab Course-II (Integral Calculus)		
Module	Topic	No of Lectures
I	**Integral as limit of Sum:** Integral as a limit of sum, Properties of Definite integrals, Fundamental theorem of integral calculus, Summation of series by integration.	08T+7P
II	**Beta and Gamma Functions:** Definitions of Beta function and Gamma Functions, Properties of Beta and Gamma Functions, Gamma function, Transformations of Gamma Functions, Relation between Beta and Gamma function, Examples.	07T+8P
III	**Double Integral:** Double integrals, Working Methods, Double integral for polar curves, Applications of Double Integrals Area, and Volume.	06T+9P
IV	**Triple integrals:** Evaluation of Triple integrals, Dirichlet's theorem, Examples on Dirichlet's theorem.	05T+10P
	Text Book	
1	Shanti Narayan, P.K. Mittal, Integral Calculus, S. Chand 2005. Scope: Chapter6: Complete Chapter 7: Articles 7.1, 7.2, 7.3, 7.3.1, 7.3.2 Chapter12: Articles 12.1,12.2,12.2.1,12.2.2 12.3,12.6,12.7	
	Reference Books	
1	Gorakh Prasad, Chandrika Prasad, Text Book on Integral Calculus 2002	
2	T.M. Apostal, Calculus Vol. I, John Wiley & Sons Inc., 1974	
3	H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc. 2007	
4	G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2010	
5	Suggested digital platform: NPTEL/SWAYAM/MOOCs	

List of Practical's

Sr	Title of Practical	Number of Examples
1	To solve examples on Definite integrals	02
2	To apply fundamental Theorem of Integral Calculus	02
3	To solve examples of summation of series by integration	02
4	To proof convergence of Beta and Gamma Function	02
5	To Solve Integrals using Beta and Gamma function	02
6	To discuss relation between Beta and Gamma functions.	02
7	To Solve double integrals, repeated integral	02
8	To solve double integral using polar coordinates	02
9	To solve examples on change of variables	03
10	To solve examples using change the order of integration in Double integrals	02
11	To solve examples on triple integrals	02
12	To apply Dirichlet's theorem	02
13	To compute area bounded by curves	02
14	To solve examples on applications of multiple integral	03

Note: Record book will consist of minimum 30 practical's and examples may vary college to college and for internal assessment 10 marks for record books and for 10 marks conduct two internal practical examination and take the average of it.

Generic/Open Elective (GE/OE)(Basket)

B.A. / B.Sc. I (SEMESTER-II)

Ge/OE : Basic Algebra

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type GE/OE	Semester: II
Prerequisites			
Course Code: SMATGE1151	Course Title: Basic Algebra		

Course Outcomes:

After Successful completion of this course students can

CO1: Uunderstand matrices and determinants.

CO2: Solve system of linear equations.

CO3: Differentiate Simple and Compound Interest.

CO4: Compute the discount and profit on sell.

Credits: 2	GE/OE
Max. Marks: 50	Min. Passing Marks:20
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-0	

Basic Algebra		
Module	Topic	No of Lectures
I	**Matrix Algebra** Definition of a Matrix, Types of Matrices, Algebra of Matrices, Determinants, Adjoint of a Matrix, Inverse of a Matrix via Adjoint Matrix	08
II	**Determinants:** Definition and Properties of determinants ,minor and cofactor ,evaluation of determinant using various properties ,Product of determinants and Crammers rule	08
III	**Adjoint of Matrix** Definition ,Methods of finding Inverse of Square Matrix ,Solution of a system of equations by the method of Inversion of Coefficient Matrix	08
IV	**Mathematics of Finance:** Compound interest, Compounding, Discounting, Examples and Problems.	06
	Recommended Books:	
1	P K Ghosh,S Saha ,Buissness Mathematics and Statistics ,New Central Book Agency (P) Ltd Scope : Module I –Chapter 1 of Part I Module II-Chapter 2 of Part I Module III -Chapter 3 of Part I Module IV Chapter 1 and 2 of Part II	
2	K. Selvakumar ,Mathematics for Commerce ,Notion Press Chennai.	
3	Khattar & S. R. Arora , Business Mathematics with Applications Dinesh S. Chand Publishing New Delhi.	
4	S. A. Bari ,Practical Business Mathematics ,New Literature Publishing Company New Delhi.	

Skill Enhancement Course

B.A. / B.Sc. I (SEMESTER-II)

SEC- Programming Using MATLAB/Scilab

Programme: Certificate Course in Mathematics Class: B.A./B.Sc. I	Year: First Level 4.5	Course Type SEC	Semester: II
Prerequisites: Elementary knowledge of coordinate axis and XII (Mathematics)			
Course Code: SMATSC1151	Course Title: Programming Using MATLAB		
Course Outcomes: After successful completion of this course students are able to: **CO1:** Do programming using MATLAB **CO2:** Define function and function files **CO3**: Plot two dimensional graphs **CO4:** Plot three dimensional plots.			
Credits: 2	SEC		
Max. Marks: 50	Min. Passing Marks:20		
Total No. of Lectures – Tutorials – Practical (in hours per week): L-T-P: 2-0-2			

Programming Using MATLAB//Scilab		
Module	Topic	No of Lectures
I	**Programming in MATLAB:** Relational and Logical Operators, Conditional Statement, The if-end structure, if-else-end Structure ,The Switch Case Statement ,Loops ,For -end loop while-end loop	06L+7P
II	**User Defined Functions and Function Files:** Creating function file, Structure of function file, Local and Global Variable, User defined function.	06L+7 P
III	**Two Dimensional Plots :** The plot command, Plot of Given Data, Plot of given Function, the fplot command Plotting multiple plots in same figure window, labelling of plot and legends, Histograms, Polar Plots	10L+10P
IV	**Three Dimensional Plots:** Line Plot, Mesh and surface plot, Plots with special Graphics, The view Command	06L+8P
Text Book		
1	Amos Gilat, MATLAB An introduction with applications Wiley India Edition 4th 2012(MATLAB User)	
2	Tejas Sheth ,SCILAB: A Practical Introduction to Programming and Problem Solving (Scilab User)	
	Reference Books	
1	Rudra Pratap ,Getting Started With MATLAB 7, Oxford University Press	
2	https://spoken-tutorial.org/tutorial-search/?search_foss=Scilab&search_language=English	
3	https://nptel.ac.in/courses/103106118	
4	S S Alam S N Alam, Understanding Matlab A Textbook For Beginners, Wiley India 2019	
5	Dr. Devendra Chouhan, Dr. Uday Dolas ,Basic Programming Concepts of SCILAB, OrangeBooks Publication 2022	
6	Suggested digital platform: NPTEL/SWAYAM/MOOCs	

List of Practical's

Sr	Title of Practical	Number of Examples
1	To Evaluate logical and relational mathematical expression	02
2	To write the programs using conditional statement	02
3	To Execute program using loops	02
4	To define function and evaluate for its value	02
5	To define anonymous function with one or more variable	02
6	To plot graph of given function with labeling	02
7	To multiple plots in one figure window	02
8	To plot with polar coordinates	02
9	To plot three dimensional plot	02
10	To Plot with special graphics.	02

Note:

1. MATLAB/Scilab or any freeware suitable software can be used to run these programs

2. Record book will consist of minimum 20 practical's and examples/Programs may vary college to college and for internal assessment 10 marks for record books and for 10 marks conduct two internal practical examination and take the average of it.

Assessment Scheme for SEC

Course Code (1)	Course Name (2)	Theory				Practical		Total Col (7+8)] (10)
		CA			ESA (6)			
		Test I (3)	Test II (4)	Avg (T1+T2)/2 (5)		CA (7)	ESA (8)	
SMATS1151	Programming Using MATLAB/Scilab	--	--	--	--	20	30	50

Assessment Scheme for Optional (Theory)/GE/Theory paper

Course Code (1)	Course Name (2)	Theory				Practical		Total Col (5+6)] (10)
		CA			ESA (6)			
		Test I (3)	Test II (4)	Avg (T1+T2)/2 (5)		CA (7)	ESA (8)	
Major(Theory)/Minor /OE/GE	Major(Theory)/Minor /OE/GE	10	10	10	40	--	--	50

Assessment Scheme for SEC /VSC/Practical

Course Name (1)	Theory				Practical		Total Col (6+7)] (8)
	CA			ESA (5)			
	Test I (2)	Test II (3)	Avg (T1+T2)/2 (4)		CA (6)	ESA (7)	
Major Practical/SEC/VEC	--	--	--	--	20	30	50

Guidelines for Course Assessment:

A. Continuous Assessment (CA) (20% of the Maximum Marks):

This will form 20% of the Maximum Marks and will be carried out throughout the semester. It may be done by conducting **Two Tests** (Test I on 40% curriculum) and **Test II** (remaining 40% syllabus). Average of the marks scored by a student in these two tests of the theory paper will make his **CA** score (col 6).

B. End Semester Assessment (80% of the Maximum Marks):

(For illustration we have considered a paper of 02 credits, 50 marks and need to be modified depending upon credits of an individual paper)

1. **ESA Question paper will consists of 6 questions, each of 10 marks.**
2. **Students are required to solve a total of 4 Questions.**
3. **Question No.1 will be compulsory and shall be based on entire syllabus.**
4. Students need to solve **ANY THREE** of the remaining Five Questions (Q.2 to Q.6) and shall be based on entire syllabus.

C. Assessment of Co-Curricular courses (CC):

a. Continuous Assessment (CA) of the CC course shall be done by the respective course coordinator depending on the regularity, performance of a student and his participation in the international, national, state, university, college level events or camps, wherever applicable.

b. End Semester Assessment (ESA) shall be done based on the write-up and presentation by the student on the activities that he has carried out throughout the semester.

c. Students have freedom to take more than one CC courses, however, score of the best performing CES shall be considered for final assessment.

d. Syllabi, Teaching Scheme and Examination Scheme for the courses in Column 7 and Column 8 (AEC, VEC, IKS, CI, EVS, CCs, etc.) shall be common for all the students from different faculties.

Note: Number of lectures required to cover syllabus of a course depends on the number of credits assigned to a particular course. One credit of theory corresponds to 15 Hours lecturing and for practical course one credit corresponds to 30 Hours. For example, for a course of two credits 30 lectures of one hour duration are assigned, while that for a three credit course 45 lectures.

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