

RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS), THANJAVUR-613005

**PG AND RESEARCH
DEPARTMENT OF MATHEMATICS**



FOR

B.Sc., M.Sc., COURSES

(for the candidates admitted from the academic year 2026-2027 on wards)

RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS),

THANJAVUR-5

DEPARTMENT OF MATHEMATICS

Minutes of the Board of Studies Meeting

Held on 10-07-2026 at 10.30 A.M.

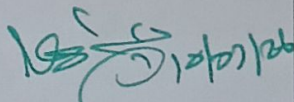
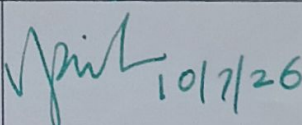
The committee **approved** the syllabus for Mathematics Programmes for the candidate admitted in the academic year 2026 - 2027 onwards with the following suggestions:

For B.Sc. Mathematics

- (i) Integral Calculus and Analytical Geometry, Vector Analysis and Fourier series courses should be offered in separate semesters.
- (ii) Discrete Mathematics may be treated as elective course and Sequence & series replaces Discrete Mathematics in the core course.
- (iii) Linear Algebra can be offered as a core course.
- (iv) Statics and Dynamics are combined as a single course "Mechanics".
- (v) Allied Chemistry should be replaced by Mathematical Statistics for the First year Students.

For M.Sc. Mathematics

- (i) Linear Algebra, Measure theory and Number theory courses should be introduced.
- (ii) Algebra and Real Analysis should be divided as two courses.
- (iii) Differential Equation should be separated as ODE and PDE.
- (iv) Probability Theory and Functional Analysis may be offered in fourth semester.

S.No	Name	Designation	Signature
1	Dr.K. ELANGO VAN Chairman	Associate Professor and Head	
2	Dr. V. PIRAMANANTHAM University Representative	Professor, Department of Mathematics, Bharathidasan University, Tiruchirappalli-24	
3	Dr. K. MUTHU GURU PACKIAM Subject Expert	Associate Professor, Department of Mathematics, Government Arts and Science College, Srivilliputhur – 15	

4	Dr. G. SRIVIDHYA Subject Expert	Assistant Professor, PG and Research Department of Mathematics, Government Arts College, Tiruchirappalli – 620 022	<i>G. Sridhy</i> 10/7/26
5	Mr. N. SURESHKUMAR Industry	Alpha Software Solution Company & Education 30, Arunagirinathar Street, Ezhil Nagar, Thanjavur-613 007	<i>N. Suresh</i> 10/7/26
6	Dr. T. STALIN Alumni	Associate Professor, Department of Mathematics, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science & Technology, Avadi, Chennai – 62	<i>T. Stalin</i> 10/7/26
7	Dr. V. RAJA Member	Associate Professor	<i>V. Raja</i> 10/7/26
8	Dr. P. GOMATHI SUNDARI Member	Associate Professor	<i>P. G. Sundari</i> 10/7/26
9	Dr. K. RADHIKA Member	Associate Professor	<i>K. Radhika</i> 10/7/26
10	Dr. SUGANTHI MARIYAPPAN Member	Associate Professor	<i>S. Suganthi</i> 10/7/26
11	Dr. N. RAJESH Member	Associate Professor	<i>N. Rajesh</i> 10/7/26
12	Dr. K.S. KRISHNAMOHAN Member	Associate Professor	<i>K.S. Krishnamohan</i> 10/7/26
13	Dr. P. SENTHIL KUMAR Member	Associate Professor	<i>P. Senthil Kumar</i> 10/7/26
14	Dr. S. SHUNMUGA PRIYA Member	Assistant Professor	<i>S. Shunmuga Priya</i> 10/07/26
15	Dr. S. ANBALAGAN Member	Assistant Professor	<i>S. Anbalagan</i> 10/7/26
16	Dr. M. KALIRAJA Member	Assistant Professor	<i>M. Kaliraja</i> 10/7/26
17	Prof. V. BHARATHI Member	Assistant Professor	<i>V. Bharathi</i> 10/7/26
18	Dr. K. GEETHA Member	Assistant Professor	<i>K. Geetha</i> 10/7/26
19	Dr. K. SANGEETHA Member	Assistant Professor	<i>K. Sangeetha</i> 10/7/26
20	Dr. P. MAHESWARI Member	Assistant Professor	<i>P. Maheswari</i> 10/7/26
21	Dr. P. BHARATHIKANNAMMAL Member	Assistant Professor	<i>P. Bharathikannammal</i> 10.07.26

SYLLABUS

FOR

B.Sc., MATHEMATICS

(for the candidates admitted from the academic year 2026 2027onwards)

RAJAH SERFOJI GOVT COLLEGE (AUTONOMOUS), THANJAVUR-5								
COURSE STRUCTURE FOR UNDER GRADUATE SCIENCE								
(Applicable to the Candidates admitted from the academic year 2026-2027 onwards)								
B.Sc., MATHEMATICS								
PART	CODE	COURSE	TITLE	HRS	MARKS		TOTAL	CREDIT
			I SEMESTER		IA	WE		
I	B1T1	LT1	Tamil - I	6	25	75	100	3
II	B1E1	LE1	English - I	6	25	75	100	3
III	B1MA1	CC1	Differential Calculus and Trigonometry	6	25	75	100	5
III	B2MA2	CC2	Integral Calculus and Analytical Geometry (Three Dimension)	3	-	-	-	-
III	B1ACH1	Allied 1	Allied Chemistry-I	4	25	75	100	4
	B1AST1		Statistics for Mathematics -I					
III	B2ACH2P	Allied 2	Allied Chemistry Practical	3	-	-	-	-
	B2AST2P		Allied Statistics Practical					
IV	B1VE	VE	Value Education	2	25	75	100	2
			TOTAL	30			500	17
			II SEMESTER		IA	WE		
I	B2T2	LT2	Tamil - II	6	25	75	100	3
II	B2E2	LE2	English - II	6	25	75	100	3
III	B2MA2	CC2	Integral Calculus and Analytical Geometry (Three Dimension)	3	25	75	100	5
III	B2MA3	CC3	Classical Algebra	6	25	75	100	5
III	B2ACH2P	Allied 2	Allied Chemistry Practical	3	25	75	100	4
	B2AST2P		Allied Statistics Practical					
III	B2ACH3	Allied 3	Allied Chemistry-II	4	25	75	100	4
	B2AST3		Statistics for Mathematics - II					
IV	B2ES	ES	Environmental Studies	2	25	75	100	2
			TOTAL	30			700	26

PART	CODE	COURSE	TITLE	HRS	MARKS		TOTAL	CREDIT
			III SEMESTER		IA	WE		
I	B3T3	LT3	Tamil - III	6	25	75	100	3
II	B3E3	LE3	English - III	6	25	75	100	3
III	B3MA4	CC4	Differential Equations & Laplace Transforms	6	25	75	100	5
III	B4MA5	CC5	Vector Analysis & Fourier Series	3	-	-	-	-
III	B3APH1	Allied 4	Allied Physics-I	4	25	75	100	4
III	B4APHP	Allied 5	Allied Physics Practical	3	-	-	-	-
IV		SEC1	Will be chosen from the list of soft skill	2	25	75	100	2
IV	B4HW	HW	Health and Wellness	-	-	-	-	1
IV		NCC-1	Introduction to NCC(for NCC Students only)				100*	2*
			TOTAL	30			500	18
			IV SEMESTER		IA	WE		
I	B4T4	LT4	Tamil-IV	6	25	75	100	3
II	B4E4	LE4	English - IV	6	25	75	100	3
III	B4MA5	CC5	Vector Analysis and Fourier Series	3	25	75	100	5
III	B4MA6	CC6	Sequences and Series	6	25	75	100	5
III	B4APHP	Allied 5	Allied Physics Practical	3	25	75	100	4
III	B4APH2	Allied 6	Allied Physics-II	4	25	75	100	4
IV		SEC2	Will be chosen from the list of soft skill	2	25	75	100	2
IV		NCC-2	Specialized Subjects - ARMY(for NCC Students Only)				100*	2*
		TOTAL		30			700	26

PART	CODE	COURSE	TITLE	HRS	MARKS		TOTAL	CREDIT
			V SEMESTER		IA	WE		
III	B5MA7	CC7	Algebra	5	25	75	100	5
III	B5MA8	CC8	Real Analysis	5	25	75	100	5
III	B5MA9	CC9	Statics	5	25	75	100	4
III	B5MA10	CC10	Programming in C	3	25	75	100	3
III	B5MA10P	CC11	Programming in C Practical	3	25	75	100	3
III		EC1	Will be Chosen from the List of Electives	4	25	75	100	4
IV		NMEC1	Will be Chosen from the List of Non -Major Electives	3	25	75	100	2
IV	B5MASE3	SEC3	Skill Enhancement course - III	2	25	75	100	2
IV	B5DM	DM	Disaster Management	-	-	-	-	2
IV		Internship	Internship	-	-	-	-	2
			TOTAL	30			800	32

PART	CODE	COURSE	TITLE	HRS	MARKS		TOTAL	CREDIT
			VI SEMESTER		IA	WE		
III	B6MA11	CC12	Complex Analysis	5	25	75	100	4
III	B6MA12	CC13	Operations Research	4	25	75	100	3
III	B6MA13	CC14	Dynamics	5	25	75	100	4
III	B6MA14	CC15	Discrete Mathematics	5	25	75	100	4
III		EC2	Will be Chosen from the List of Electives	4	25	75	100	3
III		NMEC2	Will be Chosen from the List of Non -Major Electives	3	25	75	100	2
IV		SEC4	Will be chosen from the list of soft skill	2	25	75	100	2
IV	B6GS	GS	Gender Studies	2	25	75	100	2
V		EXT. ACTIVITIES	EXTRA CURRICULAR ACTIVITIES	-	-	-	-	1
			TOTAL	30			800	25
			GRAND TOTAL				4000	144
			Papers	Tot. Credit	Part wise Cred it	Marks	4000	
PART-I	TAMIL	4x3		12	12	400		
PART-II	ENGLISH	4x3		12	12	400		
PART-III	CORE	8x5=40; 4x4=16, 3x3=9		65	96	1500		
	ELECTIVES	1x4=4, 1x3=3		7		200		
	ALLIED	6x4=24		24		600		
PART - IV	NON-MAJOR	2X2		4	23	200		
	ES,VE	2X2		4		200		
	SKILL BASED	4X2		8		400		
	GS	1x2		2		100		
	DM			2				
	Internship			2				
	HW			1				
	EXT. ACTIVITIES			1	1			
TOTAL PAPERS		38	TOTAL CREDIT	144	144	4000		

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B.Sc., MATHEMATICS COURSE STRUCTURE

(for the candidates admitted from the academic year 2026-2027 onwards)

List of Elective Course

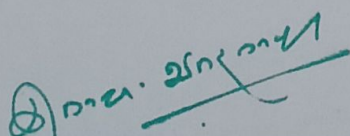
Part – A (Generic)

S.No.	Course Code	Title of the Course
1.	B1GST1 / B1GCH1	Statistics for Mathematics – I/ General Chemistry - I
2.	B2GST2 / B2GCH2	Statistics for Mathematics – II/ General Chemistry - Practical
3.	B2GST3 / B2GCH3	Statistics practical/ General Chemistry – II
4.	B3GPH1	Integrated physics –I
5.	B4GPH2	Integrated physics Practical
6.	B4GPH3	Integrated physics –II
7.	BGCH4	Applied Chemistry –I
8.	BGCH5	Applied Chemistry Practical
9.	BGCH6	Applied Chemistry –II
10.	BGPH4	Applied Physics – I
11.	BGPH5	Applied Physics Practical
12.	BGPH6	Applied Physics – II

(For students admitted from 2026-2027)

For students admitted from 2026-2027)

Title of the Course		DIFFERENTIAL CALCULUS AND TRIGONOMETRY					
Paper Number		CORE 1					
Category	Core	Year	I	Credits	5	Course Code	BIMA1
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		5	1	-		6	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1.Basic ideas on the Differential Calculus 2.Knowledge to find expansions of trigonometry functions, solve Theoretical and applied problems.					
Course outline		Unit-I Successive Differentiation – Leibnitz’s Theorem and its Applications- Maxima and Minima of Two Variables.					
		Unit –II Curvature – Radius of Curvature in Cartesian and Polar Co-ordinates – Centre of Curvature – Evolute.					
		Unit-III Expansion for $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansion for $\sin^n\theta$ and $\cos^n\theta$ - Expansion of $\sin$, $\cos\theta$ and $\tan\theta$ in powers of θ .					
		Unit –IV Hyperbolic functions – Relations between hyperbolic functions and circular trigonometry functions – Inverse hyperbolic functions.					
		Unit –V Logarithm of complex number – Summation of Trigonometrical Series.					
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		1. Calculus (Volume I), S.Narayanan and T.K.Manickavachagom Pillay, S.Viswanathan PVT., LTD (2012).					


 CONTROLLER OF EXAMINATIONS
 RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
 THANJAVUR-613 005.


 Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

	UNIT I: Chapter 3 (Full) & Chapter 4 (Sec 4) UNIT II: Chapter 10 (Sec 2.1 – 2.6 only) 2.Trigonometry, S.Narayanan and T.K.Manickavachagompillai, S.Viswanathan PVT.LTD (2008) UNIT III: Chapter 3 (Full) UNIT IV: Chapter 4 (Full) UNIT V: Chapter 5 (Sec 5 only) & Chapter 6 (Sec 1– 2 only)
Reference Books	1.Allied Mathematics by Dr.P.R.Vittal, Margam Publication (2015) (For all Units)
Web resources	https://nptel.ac.in/ 4

Course Outcomes:

Students will be able to

CO1: Find the n^{th} derivative form equations involving derivatives and applying Leibnitz's formula

CO2: Find the envelope of a given family of curves.

CO3: Expand power series and multiples of trigonometric functions in terms of $\sin \theta$ and $\cos \theta$

CO4: Determine relationship between circular and hyperbolic functions

CO5: Find the Logarithm of complex number and Summation of Trigonometrical series

Mapping of Cos with Pos and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	2	1	3	1	-	-	3	2	1
CO3	3	1	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	3	1	3	-	-	-	3	2	1

Question Paper Pattern

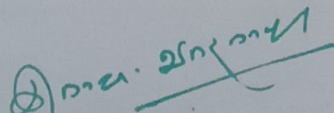
Maximum Marks: 75

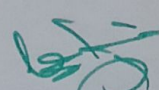
Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type—One question from each unit)

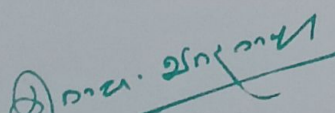
Part C: $3 \times 10 = 30$ (Three out of Five—One question from each unit)

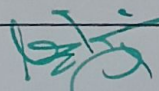

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(For students admitted from 2026-2027)

For students admitted from 2026-2027)							
Title of the Course		INTEGRAL CALCULUS AND ANALYTICAL GEOMETRY (THREE DIMENSION)					
Paper Number		CORE 2					
Category	Core	Year	I	Credits	5	Course Code	B2MA2
		Semester	I & II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		5	1	-		6	
Pre-requisite							
12 th Standard Mathematics							
Objectives of the Course							
Students have better understanding and gain Knowledge about Integration and Analytical Geometry							
Course outline							
Unit-I Definite integrals: Properties – problems - Integration by parts – problems – Reduction formula.							
Unit –II Multiple integrals: Double integrals – change the order of integration – triple integrals – properties [simple problems only]							
Unit-III Plane: standard equation of the plane – intercept form – Normal form – Plane passing through the given points - angle between the planes – Plane through line of intersection of two planes.							
Unit –IV Straight line: Equation of a straight line in symmetrical form – Equation of a straight line passing through two given points - Coplanar lines – Equation of the Coplanar lines – Shortest distance between two skew lines – Equation of shortest distance.							
Unit –V Sphere: Standard equation – length of the tangent from any point – Plane section of a sphere - Sphere passing through a given circle – intersection of two spheres –Equation of the tangent plane to the sphere.							
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		1. Calculus (Volume II), S. Narayanan and T. K. Manickavachagom Pillay, S. ViswanathanPVT.LTD, (2022). 2. Analytical geometry (Three Dimensions), T. K. Manickavachagom Pillay and T. Natarajan, S. Viswanathan, PVT. LTD, (2006).					


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(For students admitted from 2026-2027)

	Unit I: Chapter 2 (Sec. 11 - 13) Unit II: Chapter 5 (Sec. 1, 2.1, 2.2, 4) Unit III: Chapter 2 (Sec 1 - 9) Unit IV: Chapter 3 (Sec 1 - 4, 7, 8) Unit V: Chapter 4 (Sec 1 - 8)
Reference Books	1. Engineering Mathematics-I, M.K.Venkatraman, The National Publishing Company, Chennai. 2. Calculus Volume - II, S. Narayanan, T.K. Manichavasagam Pillai, S.V. Publications, Chennai.
Web resources	https://nptel.ac.in/https://www.mathsisfun./

Course Outcomes:

Students will be able to

CO1: acquire the basic knowledge of integral models and methods and the concepts of reduction formulae.

CO2: analysis of multiple integrals.

CO3: apply the concepts of analytical geometry, the properties and applications of planes.

CO4: understand the properties of lines, co-planer lines, skew lines and their applications.

CO5: evaluate the equations of sphere and passing through the circle, tangent plane.

Mapping of Cos with Pos and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	2	1	3	1	-	-	3	2	1
CO3	3	1	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	3	1	3	-	-	-	3	2	1

Question Paper Pattern

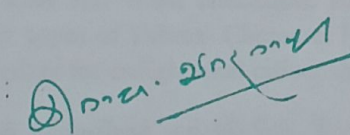
Maximum Marks: 75

Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B : $5 \times 5 = 25$ (Either/or type—One question from each unit)

Part C : $3 \times 10 = 30$ (Three out of Five—One question from each unit)


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Credits : 2 Hours/Week : 2
Medium of Instruction : English/Tamil Code: BIVE

இளநிலை பட்ட வகுப்பு - பகுதி IV

(2026 - 2027 ஆம் கல்வியாண்டு முதல் சேர்க்கப்பட்ட மாணவர்களுக்குரியது)

முதல் பருவம்

வாழ்வியல் கல்வி (Value Education)

OBJECTIVES:

- ✓ To understand the philosophy of life and values through Thirukural
- ✓ To analyse the components of values education to attain the sense of citizenship
- ✓ To understand different types of values towards National Integration and international understanding
- ✓ To learn yoga as value education to promote mental and emotional health
- ✓ To understand human rights, women rights and other rights to promote peace and harmony

UNIT I: PHILOSOPHY OF LIFE AND SOCIAL VALUES (வாழ்க்கை தத்துவம் மற்றும் சமூக விழுமியங்கள்)

Human Life on Earth (Kural 629) -Purpose of Life (Kural 46) -Meaning and Philosophy of Life (Kural 131, 226) -Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).

பூமியில் மனித வாழ்க்கை (குறள் 629) -வாழ்க்கையின் நோக்கம் (குறள் 46)- வாழ்க்கையின் பொருளும் தத்துவமும் (குறள் 131, 226)-குடும்பம் (குறள் 45)- குடும்பத்தில் அமைதி / நல்வாழ்வு (குறள் 1025) -சமூகம் (குறள் 446)-வாழ்க்கையின் நெறி / சட்டம் (குறள் 952)-சகோதரத்துவம் / நட்புடைமை (குறள் 807). மனிதனின் ஐந்து கடமைகள்/பொறுப்புகள் அ) தனக்குத்தானே செய்யும் கடமை ஆ) தனது குடும்பத்திற்குச் செய்யும் கடமை இ) தனது சுற்றுப்புறத்திற்கு/இயற்கைக்குச் செய்யும் கடமை ஈ) தனது சமூகத்திற்குச் செய்யும் கடமை உ) இவ்வுலகிற்கு/பேரண்டத்திற்குச் செய்யும் கடமை

UNIT II: HUMAN VALUES AND CITIZENSHIP (மனித விழுமியங்களும் குடியரிமையும்)

Aim of education and value education: Evolution of value-oriented education, Concept of Human values: types of Values- Character Formation – Components of Value education-A P J Kalam's ten points for enlightened citizenship- The role of media in value building

கல்வி மற்றும் விழுமியக் கல்வியின் நோக்கம்: விழுமியம் சார்ந்த கல்வியின் பரிணாம வளர்ச்சி: மனித விழுமியங்களின் கோட்பாடு: விழுமியங்களின் வகைகள்: பண்பு நலம்

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THANJAVUR-613 005.

Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

உருவாக்குதல் / குணநலன் உருவாக்கம்: விழுமியக் கல்வியின் கூறுகள்: அறிவுசார்ந்த / விழிப்புணர்வுள்ள குடியுரிமைக்கான ஏ. பி. ஜே. அப்துல் கலாமின் பத்து கட்டளைகள் - விழுமியங்களை உருவாக்குவதில் ஊடகங்களின் பங்கு.

UNIT-III VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL (தேசிய மற்றும் உலகளாவிய வளர்ச்சியை நோக்கிய கல்வி)

DEVELOPMENT:

Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal brotherhood - Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith - Religious Values: Tolerance, wisdom, character - Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same- National Integration and International Understanding.

அரசியலமைப்பு அல்லது தேசிய விழுமியங்கள்: மக்களாட்சி, சமதர்மம், மதச்சார்பின்மை, சமத்துவம், நீதி, சுதந்திரம் மற்றும் சகோதரத்துவம். சமூக விழுமியங்கள்: இரக்கமும் நேர்மையும், சுயக்கட்டுப்பாடு, உலகளாவிய சகோதரத்துவம். தொழில்சார் விழுமியங்கள்: அறிவுத் தாகம், தொழிலில் நேர்மை, ஒழுங்குமுறை, குறித்த நேரத்தில் செயல்படுதல் மற்றும் நம்பிக்கை. சமய விழுமியங்கள்: சகிப்புத்தன்மை, ஞானம், நற்பண்பு. அழகியல் விழுமியங்கள்: இலக்கியம் மற்றும் நுண்கலைகள் மீதான அன்பு, பாராட்டு மற்றும் அவற்றிற்கான மரியாதை. தேசிய ஒருமைப்பாடு மற்றும் சர்வதேச புரிதல்.

UNIT IV : YOGA AND HEALTH (யோகாவும் ஆரோக்கியமும்):

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

யோகா-வரையறை, பொருள், வரம்பு; யோகாவின் நோக்கங்களும் குறிக்கோள்களும். நவீன சூழலில் யோகா கல்வி. யோகாவின் பல்வேறு மரபுகளும் நெறிகளும். யோகா பயிற்சிகள்: ஆசனங்கள், பிராணாயாமம் மற்றும் தியானம்.

UNIT V : HUMAN RIGHTS (மனித உரிமைகள்):

Concept of Human Rights: Indian and international perspectives- Evolution of Human Rights- definitions under Indian and International documents -Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty and Dignity- Right to equality- Right against exploitation- Cultural and Educational Right- Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children - Peace and harmony.

Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

Dr. K. Elango Van
CONTROLLER OF EXAMINATIONS
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THANJAVUR-613 005.

மனித உரிமைகள் கோட்பாடு: இந்திய மற்றும் சர்வதேச கண்ணோட்டங்கள். மனித உரிமைகளின் பரிணாம வளர்ச்சி. இந்திய மற்றும் சர்வதேச ஆவணங்களின்படியான வரையறைகள். மனித உரிமைகளின் பரந்த வகைப்பாடும் தொடர்புடைய அரசியலமைப்பு விதிகளும்: வாழ்வுரிமை, சுதந்திரம் மற்றும் கண்ணியத்திற்கான உரிமை - சமத்துவ உரிமை - சுரண்டலுக்கு எதிரான உரிமை - கலாச்சார மற்றும் கல்வி உரிமை - பொருளாதார உரிமைகள் - அரசியல் உரிமைகள் - சமூக உரிமைகள். பெண்கள் மற்றும் குழந்தைகளுக்கான மனித உரிமைகள். அமைதி மற்றும் நல்லிணக்கம்.

BOOKS FOR REFERENCES:

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. Leah Levin, Human Rights, NBT, 1998
3. V.R. Krishna Iyer, Dialectics and Dynamics of Human Rights in India, Tagore Law Lectures.
4. Yogic Therapy - Swami Kuvalayananda and Dr.S.L. Vinekar, Government of India, Ministry of Health, New Delhi.
5. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications, Sedapatti, 1999.
6. Grose. D. N - "A text book of Value Education' New Delhi (2005)
7. Gawande . EN - "Value Oriented Education" - Vision for better living. New Delhi (2002) Saruptsons
8. Brain Trust Aliyar- "Value Education for Health, Happiness and Harmony" Erode (2004) Vethathiri publications

COURSE OUTCOMES: After completion of the course, the student will be able to:

- ✓ Apply the values in thirukural to be peaceful, dutiful and responsible in family and society
- ✓ Develop character formation and sense of citizenship
- ✓ Be secular, self-control, sincere, respectful and moral.
- ✓ Master yoga, asana and meditation to promote mental health
- ✓ Be attitudinal to follow the constitutional rights

Question Paper Pattern

Maximum Marks : 75

Exam Duration : 3 Hours

Part A - 5 x 6 = 30 (Either Or Type, Two Question from each Unit)

Part B - 3 x 15 = 45 (3 Out of 5, One Question from each Unit)

Dr.K. ELANGO VAN

Head & Associate Professor
Department of Mathematics

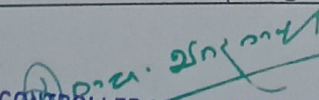
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(For students admitted from 2026-2027)

Title of the Course		CLASSICAL ALGEBRA					
Paper Number		CORE 3					
Category	Core	Year	I	Credits	5	Course Code	B2MA3
		Semester	II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		5	1	-		6	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		Students have better understanding and gain Knowledge about Classical Algebra					
Course outline		Unit-I Binomial Theorem (Statement only) Binomial: Application of the Binomial Theorem to the Summation of Series – Approximate Values- Exponential and logarithmic series: Exponential Limit – Exponential Theorem (Statement only) – Summation – Logarithmic series (Statement only) – Modification of the Logarithmic series – Problems using the Different Forms of Logarithmic series.					
		Unit –II General Summation of series-Applications of partial fraction – Product of ‘r’ successive terms of an A.P – reciprocal of the corresponding term of the series – Sum to ‘n’ terms of the series					
		Unit-III Theory of equations: Imaginary roots occur in pairs-Irrational roots occur in pairs - Relation between the roots and coefficients – Symmetric functions –Sum of the powers of the roots of an equation.					
		Unit –IV Reciprocal equation - Diminishing, increasing, multiplying the roots- Form the quotient and remainder when a polynomial is divided by a binomial – Removal of terms- Form an equation whose roots are any powers of the roots of a given equations					
		Unit –V Matrices: Symmetric (Definition Only) - Skew Symmetric matrices (Definition Only) - Hermitian and Skew Hermitian matrices (Definition Only) – Orthogonal matrices (Excluding Properties) – Eigen values and Eigen vectors – Cayley Hamilton theorem - verification of Cayley Hamilton theorem.					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency,					
Recommended Text		1.Algebra (Volume I) T. K.Manickavachagom Pillay , T. Natarajan and K.S.Ganapathy. S.Viswanathan PVT. LTD (2004)					
		2. Algebra (Volume II) T. K.Manickavachagom Pillay , T. Natarajan					


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	and K.S.Ganapathy, S.Viswanathan PVT. LTD (2004)
	Unit I: Chapter 3 (Sec. 10,14) & Chapter 4 (Sec. 1-3, 5-7) [1] Unit II: Chapter 5 (Sec. 2 - 7) [1] Unit III: Chapter 6 (Sec 9 – 13) [1] Unit IV: Chapter 6 (Sec 16 - 20) [1] Unit V: Chapter 2 (Sec 6.1 – 6.3 ,9.1 16 ,16.3) [2]
Reference Books	1.Solutins to Algebra by Dr. D. Ramamurthy , S. Viswanathan printers & Publishers, Pvt. Ltd (2016} 2.Algebra and Trigonometry (Vol. I&II) by Dr.P.R.Vittal and V.Malini, Margham Publications.
Web resources	https://nptel.ac.in/

Course Outcomes:

Students will be able to

CO1: Acquire the basic knowledge of Application of the Binomial Theorem to the Summation of Series.

CO2: Analysis of reciprocal of the corresponding term of the series and Sum to 'n' terms of the series.

CO3: Apply the concepts of Sum of the powers of the roots of an equation.

CO4: Understand the properties of. form the quotient and remainder when a polynomial is divided by a binomial.

CO5: Acquire the basic knowledge of Skew Hermitian, Orthogonal matrices and Cayley Hamilton theorem

Mapping of Cos with Pos and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	3	1	3	1	-	-	3	2	1
CO3	2	1	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	3	1	3	-	-	-	3	2	1

Question Paper Pattern

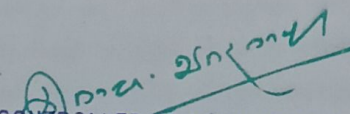
Maximum Marks: 75

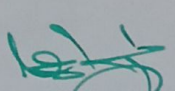
Examination Duration:3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B : $5 \times 5 = 25$ (Either/or type—One question from each unit)

Part C : $3 \times 10 = 30$ (Three out of Five —One question from each unit)


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 Dr.K. ELANGO VAN
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 Department of Mathematics
 Rajah Serfoji Govt College (Autonomous)
 Thanjavur - 613005

ENVIRONMENTAL STUDIES							
(for students admitted from the academic year 2026-2027)							
Credit	2	Hours/Week	2	Sub Code	B2ES	Semester	II
Medium of Instruction: English/Tamil						ES	

Objective:

To sensitize students on environmental issues and sustainable development practices.

Course outcomes:

Co No.	Co - Statements	Cognitive Levels
	<i>On successful completion of this course, students will be able to</i>	
CO - 1	understand the concept, structure and functions of various ecosystems.	K1, K2
CO - 2	distinguish renewable resources from non-renewable resources	K3, K4
CO - 3	value the importance of biodiversity and its conservation.	K3
CO - 4	rationalize social issues with environmental issues and realize the importance of the environment and aware of its protection	K4
CO - 5	gain knowledge on human role in environment management and conservation	K5

Unit 1

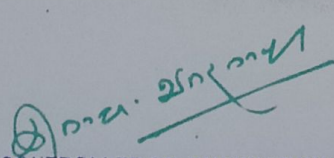
The Multidisciplinary nature of environmental studies: Scope and importance; Need for public awareness. Natural Resources: Renewable and non-renewable resources; Natural resources and associated problems - a) Forest resources, b) Water resources, c) Mineral resources, d) Food resources, e) Energy resources, f) Land resources Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

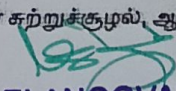
சுற்றுச்சூழல் அறிவியல்-பல்துறை தன்மை: நோக்கம் மற்றும் முக்கியத்துவம்; மக்களிடம் விழிப்புணர்வு தேவை. இயற்கை வளங்கள்: புதுப்பிக்கத்தக்க மற்றும் புதுப்பிக்க இயலா வளங்கள்; இயற்கை வளங்கள் மற்றும் பயன்பாடு தொடர்புடைய பிரச்சனைகள் - அ) வன வளங்கள், ஆ) நீர் வளங்கள், இ) கனிம வளங்கள், ஈ) உணவு வளங்கள், உ) ஆற்றல் வளங்கள், ஊ) நில வளங்கள். இயற்கை வளங்களைப் பாதுகாப்பதில் தனிநபரின் பங்கு. நிலையான வாழ்க்கை முறைக்கு வளங்களை சமமாகப் பயன்படுத்துதல்.

Unit II

Ecosystem: Concept, structure and function of an ecosystem; Energy flow in the ecosystem; Ecological succession; Food chains, food webs and ecological pyramids; Introduction, types, characteristic features, structure and function of - a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

சுற்றுச்சூழல் அமைப்பு: கட்டமைப்பு மற்றும் செயல்பாடு; சுற்றுச்சூழல் அமைப்பில் ஆற்றல் ஓட்டம்; சுற்றுச்சூழல் தொடர்வழி மாற்றம்; உணவு சங்கிலி, உணவு வலை மற்றும் சுற்றுச்சூழல் கூம்புகள்; அறிமுகம், வகைகள், சிறப்பியல்பு, கட்டமைப்பு மற்றும் செயல்பாடு - அ) வன சுற்றுச்சூழல், ஆ) புல்வெளி


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Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

சுற்றுச்சூழல், இ) பாலவன சுற்றுச்சூழல், ஈ) நீர்வாழ் சுற்றுச்சூழல் அமைப்புகள் (குளங்கள், நீரோடைகள், ஏரிகள், ஆறுகள், பெருங்கடல்கள், முகத்துவாரங்கள்).

Unit III

Biodiversity and its conservation: Genetic, species and ecosystem diversity; Biogeographical classification of India; Value of biodiversity; Biodiversity at global, National and local levels; India as a mega-diversity nation; Hot-spots of biodiversity; Threats to biodiversity; Endangered and endemic species of India; In-situ and Ex-situ conservation of biodiversity. Environmental Pollution: Definition, causes, effects and control measures of a) Air Pollution, b) Water Pollution, c) Soil Pollution, d) Marine Pollution, e) Noise pollution, f) Thermal Pollution, g) Nuclear hazards, h) solid waste; Role of an individual in prevention of pollution; Pollution case studies; Disaster management - floods, earthquake, cyclone and landslides.

பல்லுயிர் மற்றும் அதன் பாதுகாப்பு: மரபணு, இனங்கள் மற்றும் சுற்றுச்சூழல் பன்முகத்தன்மை; இந்தியாவின் உயிர் புவியியல் வகைப்பாடு; பல்லுயிர் மதிப்பு; உலகளாவிய, தேசிய மற்றும் உள்ளூர் மட்டங்களில் பல்லுயிர், இந்தியா ஒரு பெரும்-பன்முகத்தன்மை கொண்ட நாடு; பல்லுயிர் பெருக்கத்தின் செழுமை இடங்கள்; பல்லுயிர் பெருக்கத்திற்கு அச்சுறுத்தல்கள்; இந்தியாவின் அழிந்துவரும் மற்றும் உள்ளூர் இனங்கள்; அக-புறச் சூழல் பல்லுயிர் பாதுகாப்பு. சுற்றுச்சூழல் மாசுபாடு: வரையறை, காரணங்கள், விளைவுகள் மற்றும் கட்டுப்பாட்டு நடவடிக்கைகள் அ) காற்று மாசுபாடு, ஆ) நீர் மாசுபாடு, இ) மண் மாசுபாடு, ஈ) கடல் மாசுபாடு, உ) ஒலி மாசுபாடு, ஊ) வெப்ப மாசுபாடு, எ) அணு அபாயங்கள், ஏ) திடமான கழிவுகள்; மாசுபாட்டைத் தடுப்பதில் தனிநபரின் பங்கு; மாசு கள ஆய்வுகள்; பேரிடர் மேலாண்மை - வெள்ளம், பூகம்பம், சூறாவளி மற்றும் நிலச்சரிவு.

Unit IV

Social Issues and the Environment: from Unsustainable to Sustainable development; Urban problems related to energy; Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people - problems, concerns, case studies; Environmental ethics; Climate change; Global warming; Acid rain; Ozone layer depletion; Nuclear accidents and holocaust; Wasteland reclamation; Consumerism and waste products; Environmental Legislations - Environment Protection Act; Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act.; Issues involved in enforcement of environmental legislation; Public awareness.

சுற்றுச்சூழல் சார்ந்த சமூகப் பிரச்சினைகள்: நீடித்த வளர்ச்சி, நிலையான வளர்ச்சி வரை, ஆற்றல் தொடர்பான நகர்ப்புற பிரச்சினைகள், நீர் சேமிப்பு, மழை நீர் சேகரிப்பு, நீர்நிலை மேலாண்மை; மக்களின் மீள்குடியேற்றம் மற்றும் மறுவாழ்வு - பிரச்சினைகள், கவலைகள், வழக்கு ஆய்வுகள்; சுற்றுச்சூழல் நெறிமுறைகள்; பருவநிலை மாற்றம்; உலக வெப்பமயமாதல்; அமில மழை; ஓசோன் அடுக்கு சிதைவு; அணு விபத்துக்கள் மற்றும் மரணங்கள், தரிசு நில மீட்டி; நுகர்வோர் மற்றும் கழிவு பொருட்கள்; சுற்றுச்சூழல் சட்டங்கள் - சுற்றுச்சூழல் பாதுகாப்பு சட்டம்; காற்று (மாசு தடுப்பு மற்றும் கட்டுப்பாடு) சட்டம், நீர் (தடுப்பு மற்றும் மாசு கட்டுப்பாடு) சட்டம், வனவிலங்கு பாதுகாப்பு சட்டம், வன பாதுகாப்பு சட்டம்; சுற்றுச்சூழல் சட்டத்தை அமல்படுத்துவதில் உள்ள சிக்கல்கள்; பொது விழிப்புணர்வு.

Unit V

Human Population and the Environment: Population growth, Variation among nations, Population explosion, Family Welfare Programmes, Environment and human health,

Dr. K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

Dr. K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

Human Rights, Value Education, HIV/ AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health.

மக்கள்தொகை மற்றும் சுற்றுச்சூழல்: மக்கள்தொகை வளர்ச்சி, நாடுகளிடையே மாறுபாடு, மக்கள்தொகை பெருக்கம், குடும்ப நலத் திட்டங்கள், சுற்றுச்சூழல் மற்றும் மனித ஆரோக்கியம், மனித உரிமைகள், மதிப்புக் கல்வி, எச்ஐவி/எய்ட்ஸ், பெண்கள் மற்றும் குழந்தைகள் நலன், சுற்றுச்சூழல் மற்றும் மனித ஆரோக்கியத்தில் தகவல் தொழில்நுட்பத்தின் பங்கு.

Text books

1. Erach Bharucha, 2004. Textbook for Environmental studies, UGC, New Delhi.
2. Townsend C.R., Harper, J.L., Begon, M., 2009. Essentials of Ecology, Wiley, 528p.
3. N. Arumugam, V. Kumaresan. 2014. Environmental Studies. Saras Publication

Reference books

1. Abbasi, S.A., 1998. Environmental Pollution and its Control, International Publications, Pondichery.
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
3. Clark R.B., 2001. Marine Pollution, 5th edition, Oxford University Press. 248p.
4. Jadhav, H and Bhosale, V.M., 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
5. McNeely, J.A., Miller, K., Mittermeier, R.A., Reid, W.V and Werner, T.B., 1990. Conserving the world's biological diversity, IUCN.
6. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p.
7. Trivedi R.K., 2010. Handbook of Environmental Laws, Acts, Guidelines, Compliances and Standards, Vol. I and II, B.S. Publications.

Web Resources

- <https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf>
- https://www.researchgate.net/publication/349648232_Introduction_to_Environmental_Studies
- https://nitsri.ac.in/Department/CHEMISTRY/EVS_MATERIAL_2.pdf

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	2	3	3	3	3	2	3	1	2.5
CO2	3	3	3	3	3	3	1	3	2	3	2.7
CO3	3	3	3	2	3	3	1	3	3	3	2.7
CO4	3	3	3	3	3	3	1	3	1	3	2.6
CO5	1	3	3	3	3	3	1	1	1	3	2.2
Mean Overall Score											2.54
Result											High

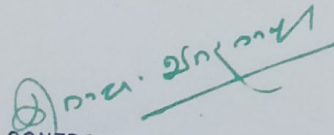
Question Pattern:

Maximum Marks: 75

Duration of Exam: 3 hrs

Part A: 5 x 6 = 30 (5 out of 7 questions, at least one question from each unit)

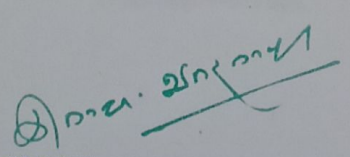
Part B: 3 x 15 = 45 (One question from each unit)

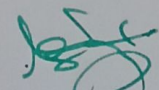

Dr. K. ELANGO
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005


Dr. K. ELANGO
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS						
Paper Number		CORE 4						
Category	Core	Year	II	Credits	5	Course Code	B3MA4	
		Semester	III					
Instructional Hours per week		Lecture		Tutorial	Lab Practice	Total		
		5		1	--	6		
Pre-requisite		12 th Standard Mathematics						
Objectives of the Course		• Knowledge about the methods of solving Ordinary and Partial Differential Equation and Laplace Transforms. • The understanding of how Differential Equations and Laplace transformations can be used as a powerful tool in solving problems in science.						
Course Outline		UNIT-I: Ordinary Differential equations – Particular integral of second and higher order Differential Equations with constant coefficients – Linear equations with variable coefficients.						
		UNIT-II: Exact differential equations – First order and higher degree equations –Variation of parameters.						
		UNIT-III: Partial Differential Equations: Formations of Partial Differential Equations – General, Particular and Singular integral -Four standard types – Lagrange's equation – Charpit's equation (simple problems)						
		UNIT-IV: Partial Differential Equations of the second order homogeneous equations with constant coefficient–particular integral of $F(D,D')z=f(x,y)$, where $f(x,y)$ is of the form e^{ax+by} , $\sin(ax+by)$, $\cos(ax+by)$, $F(x,y)$						
		UNIT-V: Laplace Transforms: Properties – Problems – Inverse Laplace Transforms- Problems –Solution of Ordinary Differential Equations using Laplace Transforms.						
Extended Professional Component (is a part of internal component only)		Questions related to the above topics, from various competitive examinations UPSC / TNPSC /TRB others to be solved (To be discussed during the Tutorial hour)						
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill						


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 RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonom
 Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	1. Calculus (Volume III), S. Narayanan and T.K. Manickavachagom Pillay, S. Viswanathan PVT. LTD, (2004). UNIT I: Chapter 2 (Sec 1-4 & 8) UNIT II: Chapter 1 (Sec 3-5) & Chapter 2 (Sec 10) UNIT III: Chapter 4 (Sec 1-3, 5-7) UNIT V: Chapter 5 (Sec 1, 2, 4-9) 2. Transforms and Partial differential equations, (Engineering Mathematics III), Dr. A. Singaravelu, Meenakshi Agency, Chennai (2012) UNIT IV: Chapter-3 (Page No: 3.139 - 3.174)
Reference Books	1. Shepley L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, 1984. 2. I. Sneddon, Elements of Partial Differential Equations, Mc Graw Hill, International Edition, 1967. 3. G.F. Simmons, Differential equations with applications and historical notes, 2nd Ed, Tata McGraw Hill Publications, 1991. 4. D.A. Murray, Introductory course in Differential Equations, Orient and Longman
Website and e-Learning Source	https://nptel.ac.in

Course Outcomes:

Students will be able to

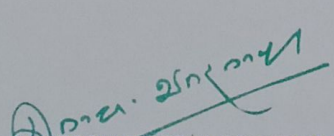
CO 1: Determine solutions of Particular integral of second and higher order Differential Equations with constant coefficients and Linear equations with variable coefficients.

CO 2: Find the solutions of exact differential equation, First order and higher degree equations, Variation of parameters.

CO 3: Find solutions of Formations of Partial Differential Equations, General, Particular and Singular integral, four standard types, Lagrange's equation, Charpit's equation (simple problems).

CO4: Find a Partial Differential Equations of the second order homogeneous equations with constant coefficient

CO5: Illustrate the concepts of Laplace transformations and determine the concepts of Inverse Laplace transformations.


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 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
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 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

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Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	2	1	-	3	2	1
CO2	3	1	3	2	1	-	3	2	1
CO3	3	1	3	2	1	-	3	3	1
CO4	3	1	3	2	2	1	3	3	1
CO5	3	1	3	2	2	1	3	3	1

Question Paper Pattern

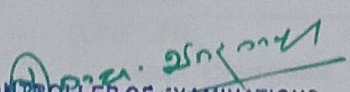
Maximum Marks: 75

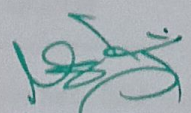
Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

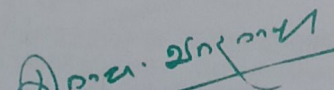
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

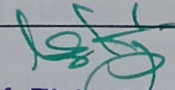

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RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
THANJAVUR-613 005.


Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		VECTOR ANALYSIS AND FOURIER SERIES					
Paper Number		CORE 5					
Category	Core	Year	II	Credits	5	Course Code	B4MA5
		Semester	III&IV				
Instructional Hours per week		Lecture		Tutorial	Lab Practice		Total
		5		1	--		6
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		• Knowledge about differentiation of vectors and on differential operators and derivatives of vector functions. • Skills in evaluating line, surface and volume integrals. • The ability to analyze the physical applications of derivatives of vectors. • Knowledge about Fourier Series and ability to solve the problems.					
Course Outline		UNIT-I: Vector differentiation: Differentiation of Vectors- A few results on differentiation of vectors –Gradient of a vector- Directional derivative – divergence and curl of a vector – solenoidal and irrotational vectors –Laplacian operator –simple problems.					
		UNIT-II: Vector integration: Tangential line integral –Conservative force field –scalar potential- Work done by force - Surface integral- Volume integral – simple problems.					
		UNIT-III: Gauss Divergence Theorem – Stoke’s Theorem- Green’s Theorem (Proof excluded) – Simple problems and Verification of the theorems.					
		UNIT-IV: Fourier series: Definition - Fourier series expansion of periodic functions with period 2π – Use of Odd and Even functions in Fourier Series.					
		UNIT-V: Half range Fourier Cosine Series – Definition and problems – Half range Fourier Sine series – Definition and problems – Change of interval.					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC / TNPSC / TRB others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					


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 RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
 THANJAVUR-613 005.


 Dr.K. ELANGO
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	1. Vector Algebra and Analysis, T.K.Manickavachagom Pillay T Natarajan , Ananda book depot (2022) UNIT I : Chapter4(Sec1,2,6-11) UNIT II : Chapter6(Sec1-5) UNIT III : Chapter6(Sec 6-10) Calculus (VolumeIII) ,S.Narayanan and T.K.Manickavachago Pillay,S.Viswanathan PVT. LTD, (2011). UNIT IV: Chapter6(Sec1-3) UNIT V : Chapter6(Sec4-6)
Reference Books	1. Allied Mathematics-I, A.Singaravelu, A.R. Publications (2002) 2. J.C.Susan, Vector Calculus, (4th Edn.)Pcarson Education, Boston, 2012. 3. A.Gorguis, Vector Calculus for College Students, Xilbius Corporation, 2014. 4. J.E.Marsden and A.Tromba, Vector Calculus, (5th Edn.)W.H. Freeman, New York, 1988.
Website and e-Learning Source	https://nptel.ac.in

Course Outcomes:

Students will be able to

CO 1: Find the derivatives of scalar and vectors and applications of the operator 'del' and to explain solenoidal and irrotational vectors.

CO 2: Solve simple line integrals , Surface integrals and Volume integrals.

CO 3: Verify the theorems of Gauss, Stoke's and Green's.

CO 4: Understanding the concepts of periodic functions, Fourier coefficients and analyze the convergence of Fourier series.

CO 5: Define half range Fourier series and solve problems involving change of interval.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	1	-	-	3	2	1
CO2	3	2	3	1	2	-	3	2	1
CO3	3	3	3	3	-	-	3	3	1
CO4	3	3	3	3	-	-	3	3	1
CO5	3	3	3	3	2	-	3	3	1

Question Paper Pattern

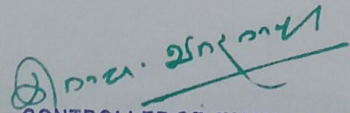
Maximum Marks: 75

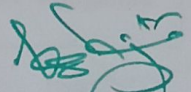
Examination Duration: 3Hours

Part A: 10 × 2 = 20 (Two questions from each unit)

Part B: 5 × 5 = 25 (Either / Or type—One questions from each unit)

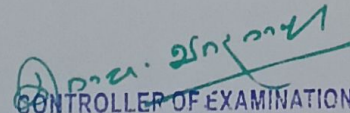
Part C: 3 × 10 = 30 (Three out of Five—One questions from each unit)

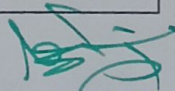

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 RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		STRESS MANAGEMENT THROUGH YOGA					
Paper Number		SEC1					
Category	SEC	Year	II	Credits	2	Course Code	B3MASE1
		Semester	III				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		2	-	-		2	
Objectives of the Course		This study investigated the effects of 8-16week Yoga on Stress and Physiological health					
Course outline		UNIT – I: Meaning and Definition of Stress, Types- Eustress- Distress- Anticipatory Anxiety – Intense Anxiety and Depression – Meaning of Management–Stress Management					
		UNIT–II: Concept of Stress according to Yoga: Patanjali aphorism (PYS II = 3) Avidya Asmita- Bhagavad-Gita (Gita II 62-63)- Dhayato Visayam Punsah ... Yoga Vasistha and Upanishad.					
		Unit–III: Physiology of Stress on: Autonomic Nervous System (ANS)- Endocrine System-Hypothalamus-Cerebral Cortex-Neuro humours					
		Unit –IV : Mechanism of Stress related diseases: Pshychie – physchomatic- Somatic phase - Organic phase- Role of Meditation & Pranayama on Stress- physiological aspect of Meditation- Constant stress & strain – anxiety – conflicts resulting in a fatigue among Executive- Contribution of Yoga to solve the stress related problems of Executive.					
		Unit –V : Meaning and definition of Health- various dimensions of health (Physical, Mental, Social and Spiritual)- Yoga and health- Yoga as therapy- Physical fitness- Stress control exercise- Sitting meditation- Walking meditation – Progressive muscular relaxation – Gentle stretches and Massage.					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					
Reference Books		1. Andrews, Linda Wasmer.,(2005). Stress control for peace of Mind. London: Greenwich Editions 2. Lalvani,Vimla.,(1998).Yogaforstress. London: Hamlyn 3. Nagendra, H.R., and Nagarathana, R., (2004). Yoga perspective in stress management 4. Nagendra ,H.R.,and Nagarathana,R.,(2004). Yoga practicesfor anxiety & depression. Bangalore: Swami Sukhabodananda 5. Sukhabodananda ,Swami., (2002). Stress Management. Bangalore: Prasanna trust.					


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 RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
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 Rajah Serfoji Govt. College (Autonomo
 Thanjavur - 613005

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Course Outcomes:

Students will be able to

CO1:Yoga appears to be effective for stress amelioration and promotion of psychological health

CO2:Demonstrate basic skills associated with stress and Yoga activities including strength and flexibility, balance and coordination.

CO3:Demonstrate the ability to perform Yoga movement in various combination and forms.

CO4:Understand and apply the knowledge of basic sequencing and effective group management.

CO5:Yoga might also help you to manage your symptoms of depression and anxiety that are due to different situations

Mapping of Cos with Pos and PSOs:

PO	POs							PSOs		
CO	1	2	3	4	5	6	...	1	2	3
CO1	3	3	2	3	1	---	...	3	3	1
CO2	3	3	2	3	1	---	...	3	3	1
CO3	3	3	2	3	2	---	...	3	3	1
CO4	3	3	2	3	1	---	...	3	3	1
CO5	3	3	2	3	2	---	...	3	3	1

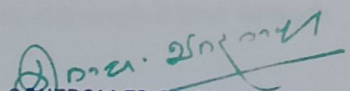
Question Paper Pattern

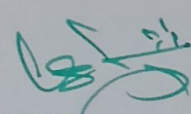
Maximum Marks: 75

Examination Duration:3Hours

Part – A 5X6 =30 Marks Either or type – (Two questions from each unit)

Part – B 3X15=45 Marks (Three out of Five and One question from each Unit)


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Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

---- 23 - 886*		L	T	P	C**	code
AUDIT	HEALTH & WELLNESS	0	0	2	1	B4HW

*(First four digits in the subject code is branch code and Seventh digit is Semester)

** Health & Wellness has one credit for the third semester only and it has no credits for other semesters.

Skill Areas:

Physical Fitness, Nutrition, Mental Health, Awareness on Drug addiction and its effects

Purpose:

The Health & Wellness course focuses on teaching the elements of physical, mental, emotional, social, intellectual, environmental well-being which are essential for overall development of an individual. The course also addresses the dangers of substance abuse and online risks to promote emotional and mental health.

Learning Outcomes:

Upon completion of the Health & Wellness course, students will be able to:

1. Demonstrate proficiency in sports training and physical fitness practices.
2. Improve their mental and emotional well-being, fostering a positive outlook on health and life.
3. Develop competence and commitment as professionals in the field of health and wellness.
4. Awareness on drug addiction and its ill effects

Focus:

During the conduct of the Health & Wellness course, the students will benefit from the following focus areas:

1. Stress Management.
2. Breaking Bad Habits.
3. Improving Interpersonal Relationships.
4. Building Physical Strength & Inner Strength.

Role of the Facilitator:

The faculty plays a crucial role in effectively engaging with students and guiding them towards achieving learning outcomes. Faculty participation involves the following areas:

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Head & Associate Professor
Department of Mathematics
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1. **Mentorship & Motivation:** The Facilitator mentors students in wellness and self-discipline while inspiring a positive outlook on health. Faculty teach stress management, fitness, and daily well-being.
2. **Promoting a Safe and Inclusive Environment:** The facilitator ensures a safe, inclusive, and respectful learning environment for active student participation and benefit.
3. **Individualised Support and Monitoring Progress:** The facilitator plays a crucial role in providing personalized support, monitoring and guidance to students.

Guided Activities:

In this course, several general guided activities have been suggested to facilitate the achievement of desired learning outcomes. They are as follows:

1. Introduction to Holistic Well-being.
2. Holistic Wellness Program- Nurturing Body and Mind
3. Breaking Bad Habits Workshop.
4. Improving the elements of physical, emotional, social, intellectual, environmental and mental well-being.
5. Creating situational awareness, digital awareness.
6. Understanding substance abuse, consequences and the way out.

Period Distribution

The following are the guided activities suggested for this Audit course.

The Physical Director should plan the activities by the students.

Arrange the suitable Mentor / Guide for the wellness activities.

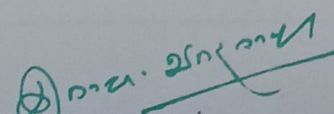
Additional activities and programs can be planned for Health and Wellness.

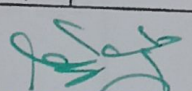
S.No	Guided Activities	Period
1	Introduction to Holistic Well-being 1. Introduce the core components of Health & Well-being namely Physical, mental and emotional well-being 2. Provide worksheets on all the four components individually and explain the interconnectedness to give an overall understanding.	
2	Wellness Wheel Exercise (Overall Analysis)	

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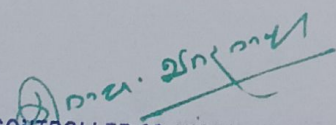
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Head & Associate Professor
Department of Mathematics
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	• Guide students to assess their well-being in various life dimensions through exercises on various aspects of well-being, and explain the benefits of applying wellness wheel. • Introduce Tech Tools: • Explore the use of technology to support well-being. • Introduce students to apps for meditation, sleep tracking, or healthy recipe inspiration.	
3	Breaking Bad Habits (Overall Analysis) • Open a discussion on bad habits and their harmful effects. • Provide a worksheet to the students to identify their personal bad habits. • Discuss the trigger, cause, consequence and solution with examples. • Guide them to replace the bad habits with good ones through worksheets.	
4	Physical Well-being 1. Fitness Introduce the different types of fitness activities such as basic exercises, cardiovascular exercises, strength training exercises, flexibility exercises, so on and so forth. (Include theoretical explanations and outdoor activity). 2. Nutrition Facilitate students to reflect on their eating habits, their body type, and to test their knowledge on nutrition, its sources and the benefits. 3. Yoga & Meditation Discuss the benefits of Yoga and Meditation for one's overall health. Demonstrate different yoga postures and their benefits on the body through visuals (pictures or videos)	


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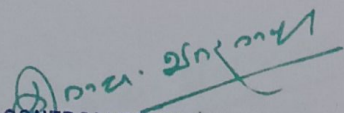

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 Head & Associate Professor
 Department of Mathematics
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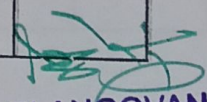
	4. Brain Health Discuss the importance of brain health for daily life. Habits that affect brain health (irregular sleep, eating, screen time). Habits that help for healthy brains (reading, proper sleep, exercises). Benefits of breathing exercises and meditation for healthy lungs. 5. Healthy Lungs Discuss the importance of lung health for daily life. Habits that affect lung health (smoking, lack of exercises). Benefits of breathing exercises for healthy lungs. 6. Hygiene and Grooming Discuss the importance of hygienic habits for good oral, vision, hearing and skin health. Discuss the positive effects of grooming on one's confidence level and professional growth. <u>Suggested Activities (sample):</u> Nutrition: Invite a nutritionist to talk among the students on the importance of nutrition to the body or show similar videos shared by experts on social media. Organize a 'Stove less/fireless cooking competition' for students where they are expected to prepare a nutritious dish and explain the nutritive values in parallel.	
5	Emotional Well-being 1. Stress Management Trigger a conversation or provide self-reflective worksheets to identify the stress factors in daily life and their impact on students' performance. Introduce different relaxation techniques like deep breathing, progressive muscle relaxation, or guided imagery. (use audio recordings or visuals to guide them through these techniques). After practicing the techniques, have them reflect on how these methods can help manage stress in daily life. 2. Importance of saying 'NO'.	


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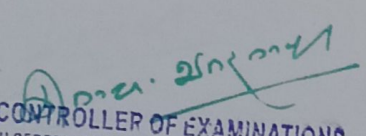
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 Head & Associate Professor
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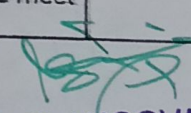
	Explain the students that saying 'NO' is important for their Physical and mental well-being, Academic Performance, Growth and Future, Confidence, Self-respect, Strong and Healthy Relationships, building reputation for self and their family (avoid earning a bad name). Factors that prevent them from saying 'NO'. How to practice saying 'NO'. 3. Body Positivity and self-acceptance Discuss the following with the students. • What is body positivity and self-acceptance? • Why is it important? • Be kind to yourself. • Understand that everyone's unique. <u>Suggested Activities(Sample):</u> (Importance of saying 'NO') Provide worksheets to self-reflect on... ...how they feel when others say 'no' to them ...the situations where they should say 'no' Challenge students to write a song or rap about the importance of saying no and how to do it effectively. Students can perform their creations for the class.	
6	Social Well-Being 1. Practicing Gratitude Discuss the importance of practicing gratitude for building relationships with family, friends, relatives, mentors and colleagues. Discuss how one can show gratitude through words and deeds. Explain how practicing gratitude can create 'ripple effect'. 2. Cultivating Kindness and Compassion Define and differentiate between kindness and compassion. Explore practices that cultivate these positive emotions. Self-Compassion as the Foundation.	


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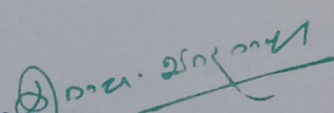

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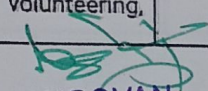
	The power of small gestures. Understanding another's perspective. The fruits of compassion. 3. Practising Forgiveness Discuss the concept of forgiveness and its benefits. Forgiveness: What is it? and What it isn't? Benefits of forgiveness. Finding forgiveness practices. 4. Celebrating Differences Appreciate the value of individual differences and foster inclusivity. The World: A Tapestry of Differences (cultures, backgrounds, beliefs, abilities, and appearances). Finding strength in differences (diverse perspectives and experiences lead to better problem-solving and innovation). Celebrating differences, not ignoring them (respecting and appreciating the unique qualities). Activities for celebrating differences (share culture, learn about others, embrace new experiences). 5. Digital Detox Introduce the students to: The concept of a digital detox and its benefits for social well-being. How to disconnect from devices more often to strengthen real-world connections. <u>Suggested Activities (sample):</u> (Practicing Gratitude) Provide worksheets to choose the right ways to express gratitude. Celebrate 'gratitude day' in the college and encourage the students to honour the house keeping staff in some way to express gratitude for their service.	
7.	Intellectual Well-being 1. Being a lifelong Learner Give students an understanding on: The relevance of intellectual well-being in this 21st century to meet	


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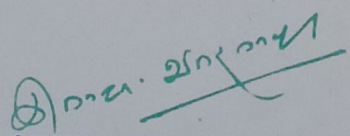

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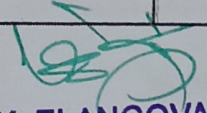
	the expectations in personal and professional well-being The Importance of enhancing problem-solving skills Cultivating habits to enhance the intellectual well-being (using the library extensively, participating in extra-curricular activities, reading newspaper etc.) 2. Digital Literacy Discuss: The key aspects of digital literacy and its importance in today's world. It is more than just liking and sharing on social media. The four major components of digital literacy (critical thinking, communication, problem-solving, digital citizenship). Why is digital literacy important? Boosting one's digital skills. 3. Transfer of Learning Connections between different subjects – How knowledge gained in one area can be applied to others. <u>Suggested Activities(sample):</u> Intellectual Well-being. Provide worksheets to students for teaching them how to boost intellectual well-being. Ask the students to identify a long-standing problem in their locality, and come up with a solution and present it in the classroom. Also organize an event like 'Idea Expo' to display the designs, ideas, and suggestions, to motivate the students to improve their intellectual well-being.	
8	Environmental Well-being 1. The Importance of initiating a change in the environment. The session could be around: Defining Environmental well-being (physical, chemical, biological, social, and psychosocial factors) – People's behaviour, crime, pollution, political activities, infra-structure, family situation etc. Suggesting different ways of initiating changes in the environment (taking responsibility, creating awareness, volunteering,	


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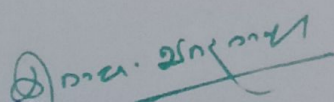

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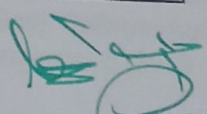
	approaching administration). Suggested Activities (sample): Providing worksheets to self-reflect on how the environment affects their life, and the ways to initiate a change. Dedicate a bulletin board or wall space (or chart work) in the classroom for students to share their ideas for improving environmental well-being. Creating a volunteers' club in the college and carrying out monthly activities like campus cleaning, awareness campaigns against noise pollution, (loud speakers in public places), addressing anti-social behaviour on the campus or in their locality.	
9	Mental Well-being 1. Importance of self-reflection Discuss: Steps involved in achieving mental well-being (self-reflection, self-awareness, applying actions, achieving mental well-being). Different ways to achieve mental well-being (finding purpose, coping with stress, moral compass, connecting for a common cause). The role of journaling in mental well-being. 2. Mindfulness and Meditation Practices Benefits of practicing mindful habits and meditation for overall well-being. 1. Connecting with nature Practising to be in the present moment – Nature walk, feeling the sun, listening to the natural sounds. Exploring with intention – Hiking, gardening to observe the nature. Reflecting on the emotions, and feeling kindled by nature. 2. Serving people Identifying the needs of others. Helping others. Volunteering your time, skills and listening ear. Finding joy in giving. 3. Creative Expressions	


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	Indulging in writing poems, stories, music making/listening, creating visual arts to connect with inner selves. <u>Suggested Activities(Sample):</u> (Mindfulness and Meditation) – Conducting guided meditation every day for 10 minutes and directing the students to record the changes they observe.	
10	Situational Awareness (Developing Life skills) 1. Being street smart Discuss: Who are street smart? Why is it important to be street smart? Characteristics of a street smart person: Importance of acquiring life skills to become street smart – (General First-aid procedure, CPR Procedure, Handling emergency situations like fire, flood etc). 2. Digital Awareness Discuss: Cyber Security Information Literacy Digital Privacy Fraud Detection <u>Suggested Activities (sample):</u> (Street Smart) Inviting professionals to demonstrate the CPR Procedure Conducting a quiz on Emergency Numbers	
11	Understanding Addiction Plan this session around: Identifying the environmental cues, triggers that lead to picking up this habit. Knowing the impact of substance abuse – Adverse health conditions, social isolation, ruined future, hidden financial loss and damaging the family reputation. Seeking help to get out of this addiction. <u>Suggested Activities:</u>	


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	Provide Worksheets to check the students' level of understanding about substance addiction and their impacts. Share case studies with students from real-life. Play/share awareness videos on addiction/de-addiction, experts talk. *Conduct awareness programmes on Drugs and its ill effects. (Arrange Experts from the concerned government departments and NGOs working in drug addiction issues) and maintain the documents of the program.	
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Closure:

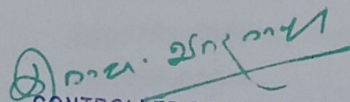
Each student should submit a Handwritten Summary of their Learnings & Action Plan for the future.

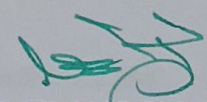
Assessments:

- Use Self-reflective worksheets to assess their understanding.
- Submit the worksheets to internal audit/external audit.
- Every student's activities report should be documented and the same have to be assessed by the Physical Director with the mentor. The evaluation should be for 100 marks. No examination is required.

Scheme of Evaluation

Part	Description	Marks
A	Report	40
B	Attendance	20
C	Activities (Observation During Practice)	40
Total		100

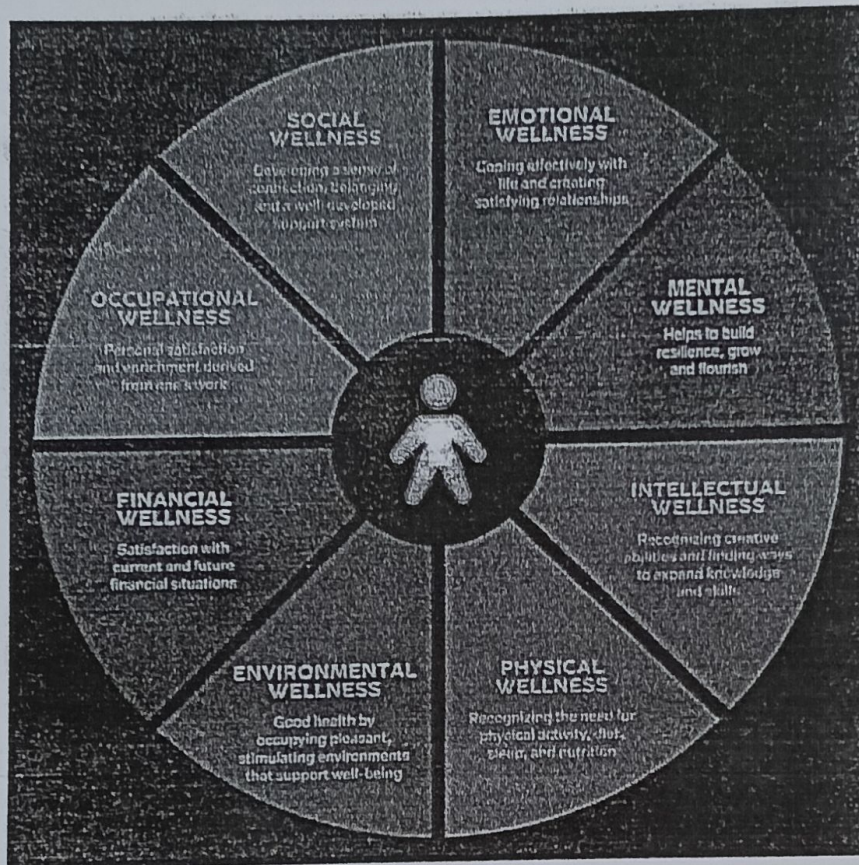

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References/Resource Materials:

The course acknowledges that individual needs for references and resources may vary. However, here are some general reference materials and resources that may be helpful:

1. The Well-Being Wheel:



2. **Facilities & Spaces:** Some activities may require access to specific facilities, resources or spaces. Students may need to coordinate with the college administration to reserve these as required.

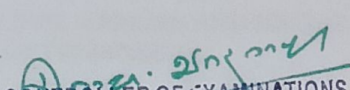
3. Online Resources:

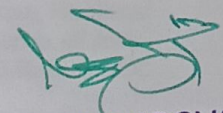
1. United Nations Sustainable Development Goals - Goal 3 - Good Health & Well-Being: <https://www.un.org/sustainabledevelopment/health/>
2. Mindfulness and Meditation: Stanford Health Library offers mindfulness and meditation resources: <https://healthlibrary.stanford.edu/books-resources/mindfulness-meditation.html>

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3. Breaking Bad Habits: James Clear provides a guide on how to build good habits and break bad ones: <https://jamesclear.com/habits>
4. 6 Ways to Keep Your Brain Sharp
<https://www.lorman.com/blog/post/how-to-keep-your-brain-sharp>
5. What Is Social Wellbeing? 12+ Activities for Social Wellness
<https://positivepsychology.com/social-wellbeing/>
6. How Does Your Environment Affect Your Mental Health?
<https://www.verywellmind.com/how-your-environment-affects-your-mental-health-5093687>
7. How to say no to others (and why you shouldn't feel guilty)
<https://www.betterup.com/blog/how-to-say-no>


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Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
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Second Year

NON MAJOR ELECTIVE COURSE-I

Semester-III

Code:

INTRODUCTION TO NCC

(Theory)

Credit:2

COURSE OBJECTIVES :

- To acquaint cadets with the aims and objectives of NCC
- To train Cadets to assist Civil Administration in performance of selective duties during disasters.
- To develop an all-round dynamic personality with adequate leadership traits to deal / contribute effectively in all walks of life.
- To teach cadets the values and skills involved in providing voluntary Social Service.
- To know respect and responsibility towards personal health and hygiene.

UNIT -I THE NCC, NATIONAL INTEGRATION AND AWARENESS :

NCC - History, aim and Objectives- Organisation and Training - Incentives of Joining NCC, Duties of NCC Cadets, Types of NCC Camps. National Integration - Religions, Culture, Traditions and Customs of India, Importance and necessity of National Integration, Problems/ Challenges/Threats of National Integration, Unity in Diversity. Famous Leaders of India. Slogans for National Integration. Contribution of Youth to Nation Building and Role of NCC in Nation Building.

UNIT -II CIVIL AFFAIRS AND SOCIAL AWARENESS COMMUNITY DEVELOPMENT:

Civil Defence Organization and its duties (NDMA,SDMA, DDMA, NDRF) Types of Natural Hazards- Role of NCC during Natural Hazards/ Calamities - Essential services. Social Services - Basics and Needs of Social Service - Social awareness - Social/ Rural Development Projects. Contribution of youth towards social welfare, Civic responsibilities. Role of Youth in Corruption, dowry, female foeticide, Drug abuse and Causes and prevention of HIV/AIDS, NGOs and their contribution in social Welfare.

UNIT -III PERSONALITY DEVELOPMENT:

Personality development - Introduction, Physical, Social, Psychological and philosophical Factors influencing personality. Self-Awareness - know yourself, Thinking- meaning and Concepts - Critical and creative thinking. Problem solving skills - Interview skills - Importance of group and team work - Coping with stress / emotions - Characteristics of healthy personalities - ethics/values

UNIT- IV HEALTH AND HYGIENE:

Structure and functioning of the human body - Hygiene and sanitation (Personal and Food Hygiene) - Physical and mental health - Infectious and contagious diseases and its prevention - Basics of first aid in common medical emergencies - Wounds and fractures - Introduction to yoga (Purpose and benefits of Padmasana, Surya Namaskar, Vajrasana, Sarvangasana, Siddhasana).

UNIT -V ENVIRONMENT AWARENESS AND CONSERVATION:

Natural resources – conservation and management - Water conservation and rain water harvesting - Waste management - Pollution – types and its control, water, air, noise, soil- Wildlife conservation: projects in India

UNIT – VI CURRENT CONTOURS: (For Continuous Internal Assessment only):

Students are allowed to practice Drill, word of Commands. Instruct the students to understand current affairs by reading leading newspapers.

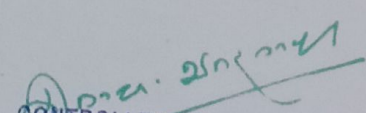
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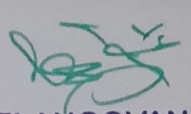
1. Cadet Hand Book (Common Subjects), published by DGNCC.
2. Cadet Hand Book (Specialized Subjects), published by DGNCC.
3. <https://modernschoolnagpur.edu.in/ncc-study-material/>
4. <https://nccorissa.org/old/Doc/Ncc-CadetHandbook.pdf>
5. <https://indiancc.nic.in/anos-handbook/>
6. R Guptas NCC Army wing. Ramesh Publishing House, New Delhi, 2021.

COURSE LEARNING OUTCOME

After completion of this Course Cadets will be able to

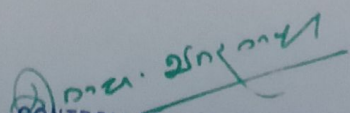
- Understand aims and objectives of NCC
- Understand the sense of patriotism, secular values
- Contribute towards nation building through national unity and social cohesion.
- Cadets would assist Civil Administration in performance of selective duties during disasters
- Develop personality with adequate leadership traits.
- Understand the responsibility towards personal health and hygiene.
- Sensitise the cadets on natural resource conservation and protection of environment.

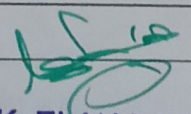

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THANJAVUR-613 005.


Dr.K. ELANGOVAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
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(For students admitted from 2026-2027)

Title of the Course		SEQUENCES AND SERIES					
Paper Number		CORE 6					
Category	Core	Year	III	Credits	5	Course Code	B4MA6
		Semester	IV				
Instructional Hours per week		Lecture		Tutorial	Lab Practice		Total
		5		1	--		6
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To study the algebra of sequences. 2. To study the convergence and divergence of series and the methods of testing the convergence. 3. To study the binomial, exponential and logarithmic series					
Course Outline		UNIT-I: Sequences – Bounded sequences – Monotonic sequences - Convergent sequences-Divergent Sequence and Oscillating sequences -Algebra of Limits.					
		UNIT-II: Behavior of Monotonic Sequences – Some theorems on Limits-Subsequences					
		UNIT-III: Limit points-Cauchy Sequences- The Upper and Lower limits of a sequences-Infinite Series- Comparison test .					
		UNIT-IV: Kummer's test- D' Alembert's Ratio test - Raabe's test – De Morgan and Betrand's test - Gauss's test-Simple problems based on above tests - Cauchy's Root test and condensation test					
		UNIT-V: Integral test- Alternative series with simple problems-Absolute Convergence					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC / TNPSC / TRB others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					


CONTROLLER OF EXAMINATIONS
RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
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Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonom
Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	Dr. S. Arumugam and Issac, Sequences and Series and Trigonometry (1997), New Gamma Publishing house. UNIT -I : Chapter 3 (sections 3.1 to 3.6) UNIT -II : Chapter 3 (sections 3.7 to 3.9) UNIT -III : Chapter 3 (Sections 3.10-3.12) Chapter 4 (Sections 4.1 ; 4.2) UNIT -IV : Chapter 4 (Sections 4.3 to 4.4) UNIT -V : Chapter 4 (Section 4.5 only) Chapter 5 (Sections 5.1 to 5.2)
Reference Books	1. T.K. Manicavachagom Pillay, T. Natarajan, K.S. Ganapathy, Algebra, Volume – I, S.Viswanathan Pvt Limited, Chennai, 2013. 2. M.K Singal and Asha Rani Singal, A first course in Real Analysis, R.Chand and Co., 1999. 3. Richard, R.Goldbeg, Methods of Real Analysis [Oxford and IBH Publishing Co.PvtLTD].
Website and e-Learning Source	https://nptel.ac.in

Course Outcomes:

Students will be able to

CO 1: Find the ability to work within an axiomatic framework sequence and limit.

CO 2: Explain the Cauchy's criterion for the convergence of real and complex sequences and series follows from the completeness axiom and the ability to explain the steps in standard mathematical notation.

CO 3: Apply the simple techniques for testing the convergence of sequences and series and confidence in applying them.

CO 4: Classify the sequences and series, with a developing intuition about the behavior of new ones.

CO 5: Determine the alternative series and develop the ability to deduce some of their easier properties.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	4	2	2	3	1	-	3	2	1
CO2	4	3	2	3	2	-	3	2	1
CO3	3	2	2	2	-	-	2	3	1
CO4	2	3	2	2	2	-	3	3	1
CO5	3	3	2	3	1	-	3	3	1

Question Paper Pattern

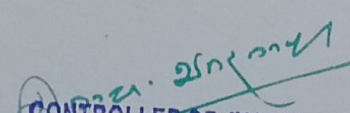
Maximum Marks: 75

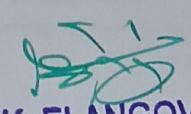
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

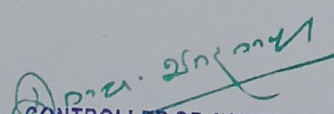
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

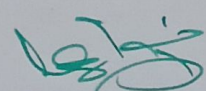

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(For students admitted from 2026-2027)

Title of the Course		HERBS AND DRUG ACTION					
Paper Number		SEC 2					
Category	SEC2	Year	II	Credits	2	Course Code	B4MASE2
		Semester	IV				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		2	-	-		2	
Objectives of the Course		The course introduces to the students to know the importance, concepts and knowledge in herbal medicine and remedy. To improve and maintain the health conditions in regular life.					
Course outline		Unit I: Terminologies – Definitions – Classification of medical plants based on their effects with special with special reference to India.					
		Unit II: Allergens – Types – Sources– Active principles – Chemical nature – Cell modifiers – Lectins – Mutagens, teratogens.					
		Unit III: Allergic reactions with known examples -Drugs acting on brain and nervous system – Rheumatic arthritis– Psychoactive drugs.					
		Unit IV: Depressants, stimulants - Hallucinogens – Sources, effects, basic mechanism of action - Cardiovascular diseases – Blood pressure – Cardiac drugs of plant origins –Alkaloids, anticoagulants.					
		Unit V: Basic mechanism of action, pulmonary/respiratory disorders – Asthma – Bronchitis – Common cold – Allergy – Remedy from plants.					
Skills acquired from this course		Knowledge of pharmaceuticals for a variety of common illnesses due to safety concerns, Desire for more Natural products. Pharmacological screening , Analysis of suitable plants extracts of medicinal importance for various herbal formulations.					
Web resources		https://nptel.ac.in/					
Reference Books		1. Kumar N.C., An introduction to Medical Botany and Pharmacognosy, Emkay Publications New Delhi (1993). 2. G.Prithiviraj Varma, Herbal Medicines of Tamil Nadu, Sura books publisher, Anna Nagar, Chennai – 600 040.					


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Course Outcomes:

Students will be able to

CO1: Explain method for identification and authentication of herbal drugs.

CO2: Explain basic principles of traditional medicinal system with method

CO3: Preparation and standardization of ayurvedic formulations.

CO4: Study the basic knowledge about the native medicine and how it works in our body.

CO5: Study the basic knowledge about the Drugs for pulmonary disorders

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	2	1	3	1	-	-	3	2	1
CO3	3	1	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	3	1	3	-	-	-	3	2	1

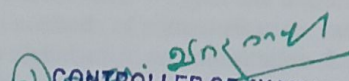
Question paper pattern

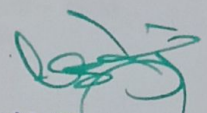
Maximum Marks: 75

Examination Duration: 3 Hours

Part – A 5X6 =30 Marks Either or type – (Two questions from each unit)

Part – B 3X15=45 Marks (Three out of Five and One question from each Unit)


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Second Year

NON MAJOR ELECTIVE COURSE-II
1. SPECIALISED SUBJECTS -ARMY

Semester-IV

Code:

(Theory)

Credit:2

4/10

COURSE OBJECTIVES:

- To acquaint cadets with the Armed Forces
- To provide knowledge of renowned Military Generals, PVCs and Indo-Pak Wars
- To teach cadets elementary map reading
- To teach cadets elementary field craft and battle craft
- To introduce cadets to the latest trends in the field of communications

UNIT -I ARMED FORCES:

Basic organization of Armed Forces - Organisation of the Army - Badges and Ranks - Honours and Awards - Modes of entry into Army -Fighting Arms - Supporting Arms and Services

UNIT- II MAP READING:

Introduction to types of Maps and conventional signs.-Scales and grid system - Topographical forms and technical terms - Relief, contours and gradients - Cardinal points and Types of North. Types of bearing- Use of service Protractor -Prismatic Compass - setting up of a Map, Finding north and own position.

UNIT- III FIELD CRAFT AND BATTLE CRAFT:

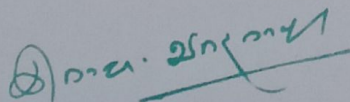
Introduction - Judging distance - Description of ground - Recognition, description and indication of land marks and targets - Observation, camouflage and concealment - Field signals - Use of ground and movement - Selection of formations - Knots and Lashing.

UNIT -IV COMMUNICATION AND LEADERSHIP:

Introduction - Types and Importance of communication - Means of communication - Modern methods of communication- radio telephony - Characteristics of Walkie talkie- The military alphabets in communication- Latest trends in communication - Leadership - types of leadership-Qualities of a leader - Leadership traits - Working in Teams & Groups. Case study - Swami Vivekananda, Rattan Tata, Rabindranath Tagore.

UNIT -V MILITARY HISTORY:

Freedom Struggle and Nationalist Movement in India.Biographies of renowned generals (Carriappa/ Manekshaw)- Indian Army War Heroes -Study of battles of indo Pak war 1965, 1971 and Kargil. Role of NCC in 1965 War.


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UNIT – VI CURRENT CONTOURS: (For Continuous Internal Assessment only):

Provide basic information on weapon and weapon training

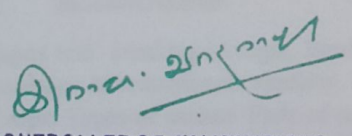
REFERENCE:

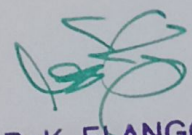
1. Cadet Hand Book (Common Subjects), published by DGNCC.
2. Cadet Hand Book (Specialized Subjects), published by DGNCC.
3. <https://modernschoolnagpur.edu.in/ncc-study-material/>
4. <https://nccorissa.org/old/Doc/Ncc-CadetHandbook.pdf>
5. <https://indiancc.nic.in/anos-handbook/>
6. R Guptas NCC Army wing, Ramesh Publishing House, New Delhi, 2021.

COURSE LEARNING OUTCOME

After completion of this Course Cadets will be able to

- Acquaint cadets with the Armed forces.
- Understand the role of renowned Military Generals, PVCs and Indo-Pak Wars
- Understand the process of map reading and conventional signs.
- Understand elementary field craft and battle craft
- Understand the latest trends in the field of communications
- Understand leadership and its traits.


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Second Year

**NON MAJOR ELECTIVE COURSE-II
2. SPECIALISED SUBJECTS - NAVY**

Semester-IV

Code:

(Theory)

Credit:2

(4) (2)

COURSE OBJECTIVES:

- To impart training on Naval Organization
- To impart basic knowledge of Naval Communication.
- To impart basic knowledge about Seamanship.
- To provide knowledge about Ship Modelling
- To provide knowledge of renowned Military Generals, PVCs and Indo-Pak Wars

UNIT -I NAVAL ORIENTATION:

History of Indian Navy - Organization of Navy - Navy head quarters - commands- Fleets-ships and shore establishments- types of warships and their role- Organization of ships and instruction on onboard organization- Organization of Army-Air Force-Navy commands- Naval customs and traditions- Ranks of officers- sailors- equivalent ranks in three services- mode of entry- Branches of Navy and their functions

UNIT- II NAVAL WARFARE AND ITS COMPONENTS :

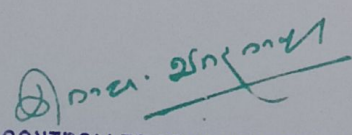
Introduction to Anti submarine warfare and fleet operation- role of aviation- Naval aircrafts and helicopters- types of submarines and their role- ASW weapons and sensors- elementary knowledge of gunnery- missiles and types of mounted guns- Parts of a torpedo- Organization of Ship- RAS- Types of warships.

UNIT -III SEAMANSHIP:

Types of ropes and breaking strength, Bends and hitches, knots and their kinds and uses. Types of cordages Introduction to shackles, hooks, blocks and derricks, coiling down and splicing of rope. Types of anchor- Parts of anchor- Use of Blocks. Parts of Blocks- Parts of boat- parts of an oar- Instructions in boat pulling- pulling orders- precautions whaler pulling- whaler and enterprise class boat including theory of sailing elementary sailing rules- power boats and types- securing and towing boats

UNIT -IV NAVIGATION:

Navigation of a ship- charts and compass- Map reading- Variation- Deviation- CADET rule- fixing the Ship's position- knots and nautical mile definitions- latitude and longitude markings- types of maps and contours- Types of Compass- Gyro compass- True and magnetic north definitions- Meaning of Flags- GPS- RACON- RADAR- SONAR- Brief characteristics of tides and its effect on ships- causes of tides- tidal streams- clouds- types- formation of clouds and effects- introduction to astronomy- Oceanography, living and non living things in sea, Exclusive economic zone, Marine conservation.


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UNIT -V NBCD:

Types of fire- Triangle of fire- Types of fire fighting- water markings in the ship- NBCD organization and structure- Damage control- causes of damage- flooding

UNIT – VI CURRENT CONTOURS: (For Continuous Internal Assessment only):

Provide basic information on weapon and weapon training

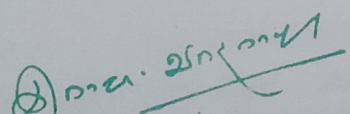
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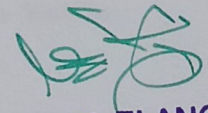
1. R Guptas NCC Navy wing. Ramesh Publishing House, New Delhi, 2021.
2. Cadet Hand Book (Common Subjects), published by DGNCC.
3. Cadet Hand Book (Specialized Subjects), published by DGNCC.
4. <https://modernschoolnagpur.edu.in/ncc-study-material/>
5. <https://nccorissa.org/old/Doc/Ncc-CadetHandbook.pdf>
6. <https://indiancc.nic.in/anos-handbook/>

COURSE LEARNING OUTCOME

After completion of this Course Cadets will be able to

- Get training on Naval Organization
- Have basic knowledge of Naval Communication.
- Understand basic knowledge about Seamanship.
- Provide knowledge about Ship Modelling
- Provide knowledge of renowned Military Generals, PVCs and Indo-Pak Wars


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Second Year

NON MAJOR ELECTIVE COURSE-II
3. SPECIALISED SUBJECTS - AIR FORCE

Semester-IV

Code:

(Theory)

Credit:2

COURSE OBJECTIVES

- To impart basic knowledge of IAF and Air Campaigns
- To provide knowledge about Aero Modelling
- To introduce principles of flight
- To provide knowledge of Aircraft Parts
- To provide knowledge of Aircraft Instruments and Air Crafts

UNIT -I ORGANIZATION & STRUCTURE OF IAF:

IAF: Introduction – Organization of Air Force – Branches – History of IAF- Air Campaigns in India -Station -Careers in IAF.

UNIT- II AIR CRAFTS RECOGNITION (ACR):

Air Craft Recognition: Identification of Aircraft – shapes – Types of Aircrafts – Foreign Aircrafts – Latest trends and Acquisitions.

UNIT- III AIRMANSHIP (AR):

Airmanship: Introduction – Airfield Layout – Rules of the Air – ATC/RT Procedures – Circuit Procedures – Aviation Medicine & Survival.

UNIT -IV AIR NAVIGATION (NV):

Navigation: Meaning – Air Navigation – Requirement of Navigation – Terms used in Navigations; Maps: Uses – Map Reading -Fundamentals of Map Reading; Meteorology (MET): Importance – Atmosphere – Clouds & Precipitation- Visibility

UNIT -V AERO MODELLING & AIRFRAMES:

Aero-Modelling (AM): Types – Materials used for Aero-modelling – Building of Aero Models: Static – Flying; History of Aero Modelling; Airframes: Aircraft controls – Main & Tail Plane – Landing Gear; Instruments: Basic Flight Instruments – Radars.

UNIT - VI CURRENT CONTOURS: (For Continuous Internal Assessment only):

Provide basic information on weapon and weapon training

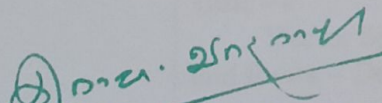
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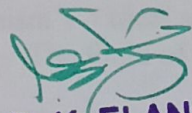
1. <https://modernschoolnagpur.edu.in/wp-content/uploads/2020/02/JDJW-Final-AF.pdf>
2. R Guptas NCC Air Force. Ramesh Publishing House, New Delhi, 2021.
3. <https://modernschoolnagpur.edu.in/ncc-study-material/>
4. <https://nccorissa.org/old/Doc/Ncc-CadetHandbook.pdf>
5. <https://indiancc.nic.in/anos-handbook/>
6. Cadet Hand Book (Common Subjects), published by DGNCC.
7. Cadet Hand Book (Specialized Subjects), published by DGNCC.
8. IFA (Air Force) Manual, Controller General of Defence Accounts, New Delhi, 2008.

COURSE LEARNING OUTCOME:

After completion of this Course Cadets will be able to

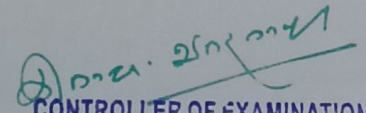
- Understand basic knowledge of IAF
- Understand basic knowledge of Air Campaigns
- Provide knowledge about Aero Modelling
- Understand the principles of flight
- Know the Parts of Aircraft.
- Understand Airfields
- Know about wireless communication and Leadership traits.

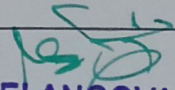

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Title of the Course		ALGEBRA					
Paper Number		CORE 7					
Category	Core	Year	III	Credits	5	Course Code	B5MA7
		Semester	V				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	1	-		5	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To prepare students to understand the concept and properties of algebra and their application 2. To provide the principles and practices of Algebra. 3.To construct a legitimate proof involves different skill and expertise.					
Course outline		Unit –I Group Theory :Subgroup– A Counting Principle–Normal subgroups and Quotient groups.					
		Unit –II Group Theory: Homomorphism's–Automorphisms.					
		Unit–III Group Theory: Cayley's Theorem–Permutation groups–Another counting principles					
		Unit –IV Ring Theory: Definition and Examples of Rings–Some Special Classes of Rings – Homomorphism's – Ideal and Quotient Rings – More Ideal and Quotient Rings – The Field of Quotients of an Integral Domain.					
		Unit –V Vector Spaces: Elementary Basic Concepts–Linear Independence and Bases – Dual Spaces– Inner Product Spaces.					
Extended Professional Component(is a part of internal component only,Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired From the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		Topics in Algebra, I.N . Herstein, John Wiley & Sons, Edition. UNIT I: Chapter2 (Sec2.4–2.6)					


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	UNIT II: Chapter2 (Sec 2.7–2.8) UNIT III: Chapter2 (Sec 2.9–2.10) UNIT IV: Chapter3 (Sec3.1–3.6) UNIT V: Chapter 4 (Sec 4.1 – 4.4)
Reference Book	Algebra, S.Lang,3rdEdition,Springer(India),2004.
Web resources	https://nptel.ac.in/

Course Outcomes:

Students will be able to

CO1: Explain groups, subgroups, normal subgroup and quotient groups

CO2: Explain homomorphism and automorphism and verify the functions for homomorphism and automorphism and verify the functions for homomorphism and automorphism properties

CO3: Explain permutation groups and apply Caley's theorem to problems

CO4: Explain rings, ideals and quotient rings and examine the structure

CO5: Discuss about vector spaces and to explain in detail about dual spaces, inner product spaces.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	...	1	2
CO1	3	3	2	3	1	---	...	3	3
CO2	3	3	2	3	1	---	...	3	3
CO3	3	3	2	3	2	---	...	3	3
CO4	3	3	2	3	1	---	...	3	3
CO5	3	3	2	3	2	---	...	3	3

Question Paper Pattern

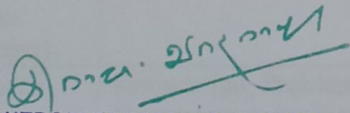
Maximum Marks: 75

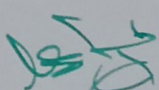
Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

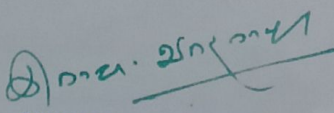
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

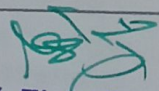

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(For students admitted from 2026-2027)

Title of the Course		REAL ANALYSIS					
Paper Number		CORE 8					
Category	Core	Year	III	Credits	5	Course Code	B5MA8
		Semester	V				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	1	-		5	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1.Real Numbers and properties of Real–valued functions.					
		2.Connectedness,Compactness,Completenessof Metricspaces					
		3.Taylor’s theorem,Binomialtheorem andL’Hospital’s ruleexamples					
Course outline		Unit –I Continuous Functions on Metric Spaces: Open sets– closed sets– Discontinuous function on $\mathbb{R}^1$. Connectedness, Completeness and Compactness: More about open sets-Connected sets.					
		Unit –II Bounded sets and totally bounded sets: Complete metric spaces - compact metric spaces, continuous functions on a compact metric space, continuity of inverse functions, uniform continuity.					
		Unit–III Calculus: Sets of measure zero, definition of the Riemann integral, existence of the Riemann integral-properties of Riemann integral.					
		Unit –IV Derivatives - Rolle’s theorem, Law of mean, Fundamental theorems of calculus.					
		Unit –V Taylor’s theorem – The Binomial theorem – L’Hospital’s rule.					
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		1.Methods of Real Analysis-Richard R.Goldberg (John Wiley & sons,2 nd edition)(Indian edition – Oxford and IBH Publishing Co, New Delhi, 1 st January 2020)					


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 Dr. K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
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 Thanjavur - 613005

(For students admitted from 2026-2027)

	UNIT-I: Chapter 5 & 6 (sections 5.3 to 5.6 & 6.1 to 6.2) UNIT-II: Chapter 6 (sections 6.3 to 6.8) UNIT-III: Chapter 7 (sections 7.1 to 7.4) UNIT-IV: Chapter 7 (sections 7.5 to 7.8) UNIT-V: Chapter 8 (sections 8.5 to 8.7)
Reference Books	1. Principles of Mathematical Analysis by Walter Rudin, Tata Mc Graw Hill Education, Third edition (1 July 2017). 2. Mathematical Analysis Tom M A postal, Narosa Publishing House, 2 nd edition (1974), Addison-Wesley publishing company, New Delhi.
Web resources	https://nptel.ac.in/

Course Outcomes:

Students will be able to

- CO1:** Explain the concepts of Continuous and Discontinuous functions, open and close sets, Connectedness, Completeness and Compactness
- CO2:** Explain the concepts of bounded and totally bounded sets, continuity of inverse functions and Uniform continuity
- CO3:** Define the sets of measure zero, to Explain about the existence and properties of Riemann integral
- CO4:** Explain the concept of differentiability and to Explain Rolle's theorem, Law of mean, and Fundamental theorem of calculus
- CO5:** Explain the binomial theorem, L'Hospital rule and to derive the Taylor's theorem

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	...	1	2
CO1	3	3	1	3	1	-	3	1	1
CO2	3	3	1	3	1	-	3	1	1
CO3	3	3	1	3	1	-	3	1	1
CO4	3	3	1	3	1	-	3	1	1
CO5	3	3	1	3	1	-	3	1	1

Question Paper Pattern

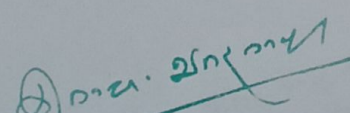
Maximum Marks: 75

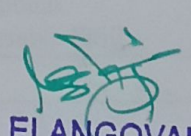
Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

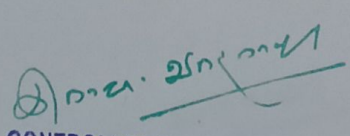
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

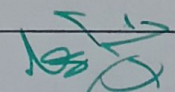

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Dr. K. ELANGO
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 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		MECHANICS I					
Paper Number		CORE 9					
Category	Core	Year	III	Credits	4	Course Code	B5MA9
		Semester	V				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		4	1		-		5
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To provide a basic knowledge of the behavior of various types of forces. 2. To give enough working knowledge to handle practical forces.					
Course outline		Unit –I Forces acting at a point: Parallelogram law - triangle law – polygon of forces – Lami’s theorm – Resloution of a force.					
		Unit –II Parallel forces and moments: Parallel forces – unlike parallel forces – moments – couples.					
		Unit–III Equation of three forces acting on a Rigid body – Necessary and sufficient condition (Equation only) – Coplanar forces – Equation to the line of action of the resultant.					
		Unit –IV Friction – Laws of friction – equation of a particle on an inclined plane – problems on friction.					
		Unit –V Equilibrium of strings: Catenary – Geometrical properties – simple problems – suspension bridge.					
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired From the course		Knowledge, Problem Solving, Analyticalability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					


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Recommended Text	Statics, M.K.Venkatraman, Agasthiyar Publications, 2002 Unit – 1 : Chapter – 2 (Sec 2.1 – 2.12, 2.15) Unit – 2 : Chapter – 3 (Sec 3.1 – 3.13) & Chapter – 4 (Sec 4.1 – 4.10) Unit – 3 : Chapter – 5 (Sec 5.1 – 5.6) & Chapter – 6 (Sec 6.1–6.3, 6.6 –6.10) Unit – 4 : Chapter – 7 (Sec 7.1 – 7.8, 7.10 – 7.12) Unit – 5 : Chapter – 11 (Sec 11.1 – 11.6, 11.9)
Reference Books	1. P.Duraipandian & Laxmi Duraipandian, Mechanics, S.Chand and co., June1997. 2. S.L.Loney, The Elements of Statics and Dynamics, Cambridge University Press, 1904 3. J.L.Meriam and L.G.Kraige, Engineering Mechanics: Statics, Seventh Edition, Wiley and sons Pvt. Ltd., New York, 2012. 4. A.Ruina and R. Pratap, Introduction to Statics and Dynamics, Oxford University Press, 2014.
Webresources	https://nptel.ac.in/

Course Outcomes:

Student will able to

- CO 1 :** Define Resultant, Component of Force, Coplanar forces, like and unlike parallel forces, Equilibrium of a particle, Limiting equilibrium of a particle on an inclined plane.
- CO 2 :** Define Moment of a force and couple with examples. Define parallel forces and forces acting along a triangle.
- CO 3 :** Define Friction, laws of friction, coefficient of Friction, Angle and cone of friction, solve problems on frictional forces.
- CO 4 :** Define Friction, laws of friction, coefficient of Friction, Angle and cone of friction, solve problems on frictional forces.
- CO 5 :** Define strings, equilibrium of strings under gravity, common Catenary and suspension bridge.

Mapping of Cos with Pos and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	2	1	1	3	3	2
CO2	3	2	3	2	1	1	3	3	2
CO3	3	2	3	2	1	1	3	3	2
CO4	3	2	3	2	1	1	3	3	2
CO5	3	2	3	2	1	1	3	3	2

Question Paper Pattern

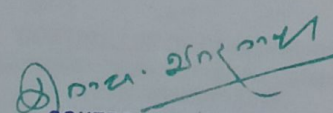
Maximum Marks: 75

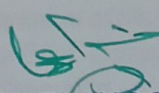
Examination Duration: 3 Hours

Part A: 10 × 2 = 20 (Two questions from each unit)

Part B: 5 × 5 = 25 (Either / Or type—One questions from each unit)

Part C: 3 × 10 = 30 (Three out of Five—One questions from each unit)

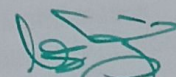

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Dr.K. ELANGO
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

(For students admitted from 2020-2021)

Title of the Course		PROGRAMMING IN C					
Paper Number		Core 10					
Category	Core	Year	III	Credits	3	Course Code	B5MA10
		Semester	V				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		2	1	-		3	
Objectives of the Course		The major objective is to provide students with understanding of code organization and functional hierarchical composition with using complex data types.					
Course outline		Unit –I: Introduction – Basic structure of C programming – Executing a C program–Character– C tokens– Keywords -Constants and variables – Assigning value to variables – Symbolic constants					
		Unit –II All operators - Arithmetic expression – Evaluation of expression – Precedence of arithmetic operators – some computational problems – Type conversion in expression – Mathematical function – Reading a character – Writing a character – Formatted input – Formatted output					
		Unit–III Decision making with IF statement – simple IF statement – IF...ELSE LADDER – Switch statement – The? : Operator – GOTO statement (Related simple problems)					
		Unit –IV While statement– Do statement – For statement – Arrays: One dimensional arrays – Two dimensional arrays – Initializing two dimensional arrays – Multi dimensional arrays.					
		Unit –V User defined function: Need for user defined functions –A multi function program – The form of C function – Return values and their types calling functions – first three category of functions –Recursion. Declaring and initializing string variable – Reading string from terminal – writing string t screen – comparison of two strings – string handling functions.					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					
Recommended Text		1. Programming in ANSI C, E.Balagurusamy, Tata McGraw – Hill publishing company Ltd, New Delhi, Second Edition. UNIT I: Chapter 1 (Sec1.2,1.4-1.6), Chapter 2 (Sec2.2-2.10) Chapter 3 (Sec 3.2 - 3.6)					



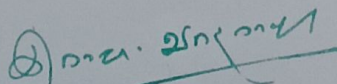
Dr.K. ELANGOVAN

Head & Associate Professor

Department of Mathematics

Rajah Serfoji Govt. College (Autonomous)

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(For students admitted from 2026-2027)

	UNIT II: Chapter 3 (Sec 3.10-3.16), Chapter 4 (Sec 4.2 - 4.5) & Chapter 5 (Sec 8.2, 8.4, 8.7, 8.8) UNIT III: Chapter 5 (Sec 5.2 - 5.9) & Chapter 6 (Sec 6.2 - 6.4) UNIT IV : Chapter 7 (Sec 7.2 - 7.5) & Chapter 9 (Sec 9.2 - 9.10, 9.13) UNIT V: Chapter 10 (Sec10.2 - 10.8) & Chapter 11 (Sec 11.1- 11.16)
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Course Outcomes:

Students will be able to

CO1: Recall the basic concepts of C Language, C tokens, constants and variables.

CO2: Defining the various types of operators, Formatted Input and output and evaluating the arithmetic expressions.

CO3: Explaining the various types of If statements, switch statement, Go to statement and For statement.

CO4: Evaluating the various programs using array concepts.

CO5: Demonstrating Structure and its types, Unions, Pointers and its applications.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	3	1	3	1	-	3	1	1
CO2	3	3	1	3	1	-	3	1	1
CO3	3	3	1	3	1	-	3	1	1
CO4	3	3	1	3	1	-	3	1	1
CO5	3	3	1	3	1	-	3	1	1

Question Paper Pattern

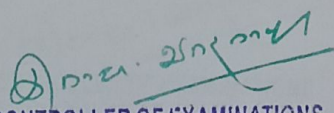
Maximum Marks: 75

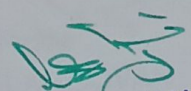
Examination Duration:3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type—One question from each unit)

Part C: $3 \times 10 = 30$ (Three out of Five —One question from each unit)


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Title of the Course		PROGRAMMING IN C - PRACTICAL					
Paper Number		Core 11					
Category	Core	Year	III	Credits	3	Course Code	B5MA10P
		Semester	V				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
			-		3		3
Objectives of the Course		C is a general – purpose language, ideal for building mostly state of the art system applications like OS kernels, data bases and embedded system are used by billions around the world.					
Course outline		1. Write a program to convert temperature form degree centigrade to Fahrenheit and Simple interest.					
		2. Write a program to find whether given number is Even or Odd.					
		3. Write a program to check the Palindrome.					
		4. Write a program to solve quadratic equation using if...else statement.					
		5. Write a program to find greatest of three numbers.					
		6. Write a program to find the multiplication of two matrices.					
		7. Write a program to display first Ten natural numbers and their sum.					
		8. Write a function to generate the Fibonacci series.					
		9. Write a program to find factorial of a number using Recursion.					
		10. Write a program to create a file containing student details.					
Recommended Text		1. Programming in ANSI C, E.Balagurusamy, Tata McGraw – Hill publishing company Ltd, New Delhi, Second Edition.					

Question Paper Pattern

Maximum Marks: 75

Examination Duration: 3 Hours

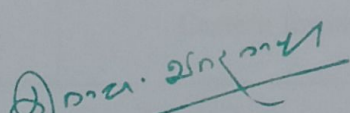
Answer All The Questions

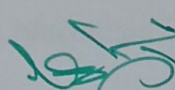
1 X 15 = 15Marks

2 x 25 = 50Marks

Record = 5 Marks

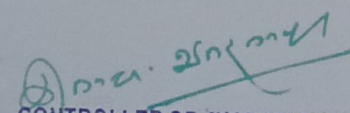
Viva voce = 5

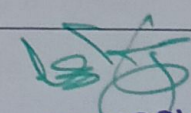

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r students admitted from 2026-2027)

Title of the Course		FOOD AND NUTRITION							
Paper Number		SEC3							
Category	SEC	Year	III	Credits	2	Course Code	B5MASE3		
		Semester	V						
Instructional Hours/per week		Lecture		Tutorial		Lab Practice		Total	
		2		-		--		2	
Objectives of the Course		The course introduces to the students to know the importance of nutritional food, knowledge of nutrition and of basic terminology and healthy food. To equip students with knowledge and understanding of Modern aspects of nutritional science and novel food usage.							
Course Outline		UNIT I: Food, Nutrition and Health: The meaning of food, nutrition, nutritional care, and health – nutritional problems in India.							
		Unit II: Biological Importance of Food: Nutritional classification of food – nutrients as body constituents – digestion and absorption of food. Types of food, caloric content, and dieting.							
		Unit III: Basic Chemical Constituents of Food: Biological functions of carbohydrates, proteins, fats, vitamins, minerals, and water.							
		Unit IV: Food Adulteration Testing: Common adulteration in food– testing methods of all food adulteration (Ghee, Chill powder, oil, Milk, Turmeric powder).							
		Unit V: Health Problems of Food Adulteration: Principal adulteration and its effect on health.							
Skills acquired from this course		Knowledge and understanding of healthy food for healthy body and also for healthy life.							
Reference Books		1. Alex Ramani V, Food chemistry, MJP Publishers, Triplicane, Chennai 2009. 2. Thangamma Jacob, Food adulteration, Macmillan Company of India limited, New Delhi 1976. 3. Jeyaraman J, laboratory manual in Biochemistry, Wiley Eastern limited, New Delhi 1981.							


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Course Outcome

Students will be able to

CO1: Knowledge: Summarize and critically discuss/understand both fundamental and applied aspects of food science.

CO 2: They will be able to explain functions of specific nutrients in maintaining health, identifying nutrient specific foods and apply principles from the various facts of food science and related disciplines

CO3: To solve practical as well as real-world problems.

CO 4: Skills: Use current information technologies to locate and apply evidence – based guidance and protocols

CO 5: Getting imparted with critical thinking to take leadership roles in fields of health, dietetics, special nutritional needs, and nutritional counseling.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	1	-	-	3	2	1
CO2	3	2	3	1	2	-	3	2	1
CO3	3	3	3	3	-	-	3	3	1
CO4	3	3	3	3	-	-	3	3	1
CO5	3	3	3	3	2	-	3	3	1

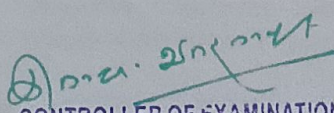
Question paper pattern

Maximum Marks: 75

Examination Duration: 3 Hours

Part – A 5X6 = 30 Marks Either or type – (Two questions from each unit)

Part–B 3X15=45 Marks (Three out of Five and One question from each Unit)


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Rajah Serfoji Govt. College (Autonomous)
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Credits : 2
Medium of Instruction : English / Tamil

Hours/Week : 2
Code : B5DM

இளநிலை பட்ட வகுப்பு - பகுதி - IV

(2026 - 2027 ஆம் கல்வியாண்டு முதல் சேர்க்கப்பட்ட மாணவர்களுக்குரியது)

ஐந்தாம் பருவம்

DISASTER MANAGEMENT (பேரிடர் மேலாண்மை)

Course Description

Disasters pose serious threats to human life, property, infrastructure, and the environment. Increasing urbanization, climate change, environmental degradation, and technological developments have intensified disaster risks across the world. This course introduces students to the concepts of disaster risk reduction and management, enabling them to understand disaster risks, adopt preparedness measures, and contribute to building resilient communities. The course also familiarizes students with disaster governance in Tamil Nadu and highlights the importance of community participation, environmental sustainability, and responsible citizenship in reducing disaster risks.

Course Objectives

Upon completion of the course, students will be able to:

1. Understand the concepts and significance of disaster risk reduction and management.
2. Identify different types of natural and human-induced disasters.
3. Understand disaster preparedness, mitigation, response, and recovery measures.
4. Recognize the role of individuals, communities, and institutions in disaster management.
5. Develop awareness and skills for disaster preparedness and resilience.

UNIT I – Fundamentals of Disaster Risk Reduction

Disaster: Meaning and Characteristics - Hazard, Risk, Vulnerability and Capacity - Disaster Risk Reduction (DRR): Concept and Importance - Disaster Management Cycle: Prevention - Mitigation - Preparedness - Response - Recovery - Rehabilitation - Community Resilience.

UNIT II – Types of Disasters

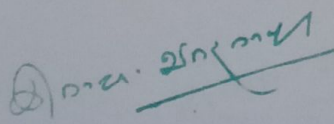
Natural Disasters: Earthquakes - Floods - Cyclones - Tsunami - Drought - Landslides - Heat Waves and Lightning - Sea-Level Rise - Human-induced Disasters: Fire Accidents - Industrial and Chemical Disasters - Biological Emergencies and Pandemics - Air Crashes, Road and Rail Accidents - Environmental Pollution.

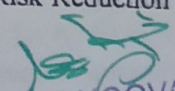
UNIT III – Disaster Preparedness and Emergency Response

Early Warning Systems - Disaster Preparedness at Home, School and Workplace - Emergency Kits - Evacuation Procedures - First Aid Awareness - Search and Rescue Basics - Fire Safety - Relief and Rehabilitation - Psychological Support during Disasters

UNIT IV – Disaster Governance in India

Disaster Management Act, 2005 - National Disaster Management Authority (NDMA) - National Disaster Response Force (NDRF) - State and District Disaster Management Authorities - Role of Local Bodies - NGOs - Sendai Framework for Disaster Risk Reduction


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- Sustainable Development Goals (SDG) and Disaster Resilience.

UNIT V – Building Disaster-Resilient Communities

Disaster Resilience: Concept and Importance - Community-Based Disaster Risk Reduction (CBDRR) - Disaster Risk Reduction in Educational Institutions - Role of Volunteers and Civil Society - Best Practices in Disaster Risk Reduction: Selected Case Studies from India - Odisha Cyclone Preparedness Model, 2004 Indian Ocean Tsunami, COVID-19 Pandemic.

Practical / Experiential Learning (NON-EXAMINATION COMPONENT)

Students shall undertake **any one** of the following:

- Preparation of a Family Disaster Preparedness Plan.
- Campus Hazard Mapping.
- Awareness Campaign on Disaster Preparedness.
- Preparation of an Emergency Survival Kit.
- Participation in a Mock Drill.
- Visit to Fire and Rescue Services or District Disaster Management Office.
- Case Study of a Major Disaster in India.

Course Outcomes (COs)

After completing the course, students will be able to:

CO1: Explain the basic concepts and principles of disaster risk reduction and management.

CO2: Identify various natural and anthropogenic disasters and assess their impacts.

CO3: Demonstrate awareness of disaster preparedness, emergency response, and safety measures.

CO4: Describe the institutional framework for disaster management in India.

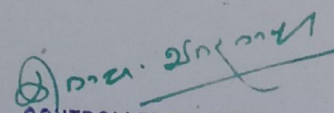
CO5: Promote disaster-resilient practices in families, educational institutions, and communities.

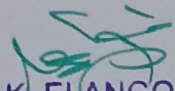
Text Books

1. Subramanian, R. *Disaster Management*. New Delhi: Vikas Publishing House, 2018.
2. S.C. Sharma, *Disaster Management*, New Delhi: Khanna Publishing House, 2019.
3. D.B.N. Murthy, *Disaster Management Text and Case Studies*, New Delhi: Deep & Deep Publications, 2008.
4. Shrivastava, A.K. *Text book of Disaster Management*, Jodhpur: Scientific Publishers, 2020.
5. Rajendra K. Pandey, *Disaster Management in India: Policies, Institutions, Practices*, New York: Routledge, 2023.

References

1. Alexander, David. *Principles of Emergency Planning and Management*. Oxford University Press, 2002.
2. Carter, W. Nick. *Disaster Management: A Disaster Manager's Handbook*. Asian Development Bank, Manila, 2008.
3. Coppola, Damon P. *Introduction to International Disaster Management*. 4th ed., Butterworth-Heinemann/Elsevier, 2020.
4. Government of India. *The Disaster Management Act, 2005*, New Delhi: Government of India.
5. National Disaster Management Authority (NDMA). *National Disaster Management Plan*, New Delhi: Government of India, 2019.
6. National Institute of Disaster Management (NIDM). *Training Designs and Modules on Disaster Risk Reduction*, Government of India.
7. Tamil Nadu State Disaster Management Authority, *District Disaster Management Plan – 2024, Thanjavur District*.


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RAJAH SERTOJI GOVERNMENT COLLEGE (AUTONOMOUS)
THANJAVUR-613 005.


Dr. K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Sertoji Govt. College (Autonomous)
Thanjavur - 613005

- United Nations Development Programme (UNDP). *Reducing Disaster Risk: A Challenge for Development*.
9. United Nations Office for Disaster Risk Reduction (UNDRR). *Sendai Framework for Disaster Risk Reduction 2015–2030*.
10. Wisner, Ben, Piers Blaikie, Terry Cannon, and Ian Davis. *At Risk: Natural Hazards, People's Vulnerability and Disasters*. 2nd ed., Routledge, 2003.
11. World Bank. *Building Resilient Communities: Risk Management and Response to Natural Disasters*.

Online Resources

1. India Meteorological Department (IMD)
2. Indian National Centre for Ocean Information Services (INCOIS)
3. National Disaster Management Authority (NDMA)
4. National Disaster Response Force (NDRF)
5. National Institute of Disaster Management (NIDM)
6. Tamil Nadu State Disaster Management Authority (TNSDMA)
7. TNSDMA Digital Library
8. United Nations Office for Disaster Risk Reduction (UNDRR)

CO–PO Mapping Matrix

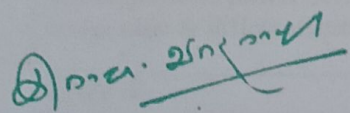
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	1	2	1	–	1
CO2	3	3	1	3	1	–	1
CO3	2	3	2	3	2	2	2
CO4	2	2	2	2	3	3	1
CO5	2	3	2	3	3	3	3

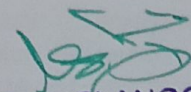
Question Paper Pattern

Maximum Marks : 50

Exam Duration : 3 Hours

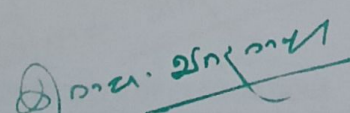
Part A - $5 \times 10 = 50$ (5 Out of 8, atleast One Question from each Unit)

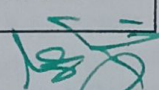

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(For students admitted from 2026-2027)

Title of the Course		COMPLEX ANALYSIS					
Paper Number		CORE 12					
Category	Core	Year	III	Credits	4	Course Code	B6MA11
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial	Lab Practice	Total		
		4	1	--	5		
Objectives of the Course		1. Apply concept and consequences of analyticity and C-R equations. 2. Understand the concept of the mappings and transformations. 3. Compute complex contour integrals and applying Cauchy's integral in various versions. 4. Understand zeros and singularities of an analytic function, apply their properties in the evaluation of definite integral.					
Course Outline		UNIT-I: Analytic functions: Functions of a complex variable- Limits – Theorem on limits – Continuity – Derivatives – Differentiation formulas – Cauchy Riemann equation – conditions for differentiability – Polar coordinates – Analytic functions – Harmonic functions.					
		UNIT-II: Conformal mapping: Mappings – Mapping by exponential function – Linear transformation – The transformation $w= 1/z$ - Mappings by $1/z$ – Linear fractional transformations(bilinear)					
		UNIT-III: Complex Integration: Contour integrals – Some examples – Simply and Multiply connected domains – Cauchy integral formula – Formula for derivatives – Liouville's theorem – Fundamental theorem of Algebra – Maximum modulus principle.					
		UNIT-IV: Sequences and Series: Convergence of sequences – Convergence of series – Taylor's series – Laurent series – Absolute and uniform convergence of power Series – continuity of sums of power series – Integration & differentiation of power series.					
		UNIT-V: Residues and Poles: Isolated singular points – Residues – Cauchy Residue theorem – Residue at infinity – The three types of isolated singular points – Residues at poles – Zeros of analytical functions – Zeros and poles – Evaluation of real improper integrals(excluding poles on the real axis).					
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					


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Recommended Text	Complex variables and application, Seventh Edition by James Ward Brown and Ruel V. Churchill, Me-Graw Hill Book Co., International Edition, 2009. Unit – 1 : Chapter: 2 Section 11, 14 ,15, 17 - 23, 25 Unit – 2 : Chapter: 2 Section 12, 13 Unit – 3 : Chapter: 4 Section 39, 40, 46 -50 Unit – 4 : Chapter: 5 Section 51 - 53, 55, 57 - 59 Unit – 5 : Chapter: 6 Section 61 - 63, 65, 66, 68, 69 , 71
Reference Books	Theodore W. Gamelan, Complex Analysis , Springer Verlag , 2008 Joseph Bak and Donald J. Newman, Complex analysis, 2 nd Ed., Undergraduates Texts in Mathematics, Springer- Verlag New York ., New York, 1997.
Extended Professional Component	Questions related to the above topics, from various competitive examinations UPSC/ TRB / NET/ UGC – CSIR/GATE/ TNPSC/ others to be solved(To be discussed during the Tutorial hour)
Website and e-Learning Source	https://nptel.ac.in/

Course Outcome

Students will be able to

- CO1:** Explain about analytic functions, their differentiation and continuity and to verify the Harmonic functions using analyticity conditions
- CO2:** Explain the concept of Conformal mappings and mappings by linear transformation and linear fractional transformations
- CO3:** Explain about the integrations of functions over simply and multiply connected domains and to derive the Cauchy integral formula, Liouville's theorem, Fundamental theorem of Algebra and Maximum Module Principle
- CO 4:** Find the convergence the sequences and series, to derive Taylors's and Laurent's series.
- CO 5:** Find the nature of singularities, to find the residue of a given function at a given singular point, to Explain about zeros and poles and to evaluate real improper integrals. Excluding poles on the real axis

Mapping of Cos with Pos and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	3	3	2	1	-	3	3	2
CO2	3	3	3	2	1	-	3	3	2
CO3	3	3	3	2	1	-	3	3	2
CO4	3	3	3	2	1	-	3	3	2
CO5	3	3	3	2	1	-	3	3	2

Question Paper Pattern

Maximum marks: 75

Examination duration: 3 hours

Part- A: 10X2 = 20 Marks (Two questions from each unit)

Part-B: 5X5 = 25 Marks (Either/or type-One question from each Unit)

Part-C : 3X10 = 30 Marks (Three out of Five- One question from each unit)

[Signature]

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[Signature]
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Rajah Serfoji Govt. College (Autonomous)
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(For students admitted from 2026-2027)

Title of the Course		OPERATIONS RESEARCH					
Paper Number		CORE 13					
Category	Core	Year	III	Credits	3	Course Code	B6MA12
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		3	1		-		4
Objectives of the Course		1. To introduce the field of operations research this has many applications in management techniques. 2. To help students to find optimum solutions in business and management problems. 3. To develop scientific ability.					
Course outline		Unit –I Linear Programming Problem: Introduction –Mathematical Formulation of the problem – Graphical Solution Method – Simplex method–Big (M) Method.					
		Unit –II Transportation Problem: Introduction – North west corner rule– Least cost method – Vogel’s approximation Method – MODI Method – Assignment problems.					
		Unit–III Sequencing Problems: Introduction–Problem of sequencing –Basic term used in sequencing – Processing n Jobs through 2 machines– Processing n Jobs through k machines - Processing 2 Jobs through k machines.					
		Unit –IV Replacement Problems: Introduction – Replacement of Equipment / asset that Deteriorates Gradually – Replacement of Equipment that fails suddenly.					
		Unit –V Network scheduling by PERT/CPM: Introduction–Network and basic components–Rules of network construction– Critical path analysis –Probability consideration in PERT –Distinction between PERT and CPM.					
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					
Recommended Text		1. Operations Research – Kanti Swarub, P.K.Gupta, Man Mohan. Sultan Chan & Sons Educational Publishers New Delhi, Sixteenth thoroughly Revised Edition Reprint – 2014.					

(For students admitted from 2026-2027)

	UNIT I :Chapter 2 (sections2.1,3), Chapter3 (sections3.1,2) & Chapter4 (sections4.1,4.4) UNIT II:Chapter10 (sections 10.1, 10.2, 10.8,10.9, 10.13), Chapter11(sections 11.1, 11.2, 11.3, 11.4) UNIT III:Chapter12 (sections12.1 to 12.6) UNIT IV:Chapter18 (sections18.1 to 18.3) UNIT V : Chapter25(sections 25.1, 25.2, 25.4, 25.6, 25.7, 25.8).
Reference Books	1. Hamdy A.Taha, Operations Research (7 th Edn.), Prentice Hall of India, 2002. 2. Richard Bronson, Theory and Problems of Operations Research, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1982. 3. Kanti Swarup, P.K.Gupta and Man Mohan, Operations Research (Sultanchand and sons).

Course Outcomes:

Students will be able to

- CO1:** Learn mathematical techniques that will help them to understand and analyze managerial problems in industry so that resources (Capitals, Materials, staffing and machines) may be utilized more effectively.
- CO2:** Use mathematical software to solve the Transportation Problems.
- CO3:** Identity and develop operational research models from the verbal description of the real system.
- CO4:** Solve the replacement problem.
- CO5:** Understand the Network scheduling of PERT/CPM method.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	2	1	1	3	3	2
CO2	3	2	3	2	1	1	3	3	2
CO3	3	2	3	2	1	1	3	3	2
CO4	3	2	3	2	1	1	3	3	2
CO5	3	2	3	2	1	1	3	3	2

Question Paper Pattern

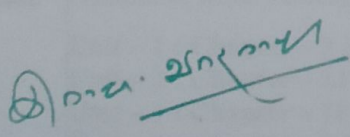
Maximum Marks: 75

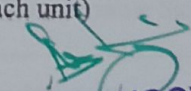
Examination Duration:3 Hours

Part A:10×2=20 (Two questions from each unit)

Part B: 5×5=25 (Either/or type – One question from each unit)

Part C: 3×10=30 (Three out of Five – One question from each unit)


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 Rajah Serfoji Govt. College (Autonomous)
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(For students admitted from 2026-2027)

Title of the Course		MECHANICS II					
Paper Number		CORE 14					
Category	Core	Year	III	Credits	4	Course Code	B6MA13
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	1	-		5	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To explore basic knowledge about the Kinematics and central orbit. 2. To provide knowledge about Projectiles, Simple Harmonic motion and collision of elastic bodies					
Course outline		Unit –I Kinematics: Velocity – Acceleration – Relative velocity – Angular velocity – motion in a straight line under uniform acceleration.					
		Unit –II Central orbit: Radial and transverse components of velocity and acceleration – Central force – Differential equation to a central orbit in polar co-ordinates – pedal equations – Given the central orbit – Law of force – Related problems.					
		Unit–III Simple Harmonic Motion: Amplitude and periodic time – Composition of two simple harmonic motions – load suspended by an elastic string.					
		Unit –IV Projectiles: Path of a projectile - greatest height – range – time of flight – Range on an inclined plane – maximum range.					
		Unit –V Collision of elastic bodies: Impact of a sphere on a plane – Direct and oblique impact of two smooth spheres – loss of kinetic energy.					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination Question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired From the course		Knowledge, Problem Solving, Analyticalability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					
Recommended Text		Dynamics, M.K.Venkatraman, Agasthiyar Publications, 1990 Unit – 1 : Chapter – 3 (Sec 3.3, 3.9 – 3.15, 3.17, 3.22) Unit – 2 : Chapter – 11 (Sec 11.2, 11.5 – 11.9, 11.11 – 11.13) Unit – 3 : Chapter – 10 (Sec 10.1 – 10.9) Unit – 4 : Chapter – 6 (Sec 6.1 – 6.10, 6.12) Unit – 5 : Chapter – 8 (Sec 8.1 – 8.8)					

(For students admitted from 2026-2027)

Reference Books	1. P.Duraipandian & Laxmi Duraipandian, Mechanics, S.Chand and co., June1997. 2. S.L.Loney, The Elements of Statics and Dynamics, Cambridge University Press, 1904. 3. J.L.Meriam and L.G.Kraige, Engineering Mechanics: Dynamics, Eighth Edition, Wiley and sons Pvt. Ltd., New York, 2012. 4. A.Ruina and R. Pratap, Introduction to Statics and Dynamics, Oxford University Press, 2014
Web resources	https://nptel.ac.in/

Course Outcomes

Student will able to

CO 1: Define velocity, acceleration and motion in a straight line under uniform acceleration.

CO 2: Define central force, central orbit, differential equation and pedal equation to the central orbit.

CO 3: Define simple harmonic motion, composition of two simple harmonic motions and load suspended by an elastic string.

CO 4: Define Projectile, characteristics of projectiles and projectile up/down on an inclined plane.

CO 5: Define direct impact, oblique impact, and loss of kinetic energy due to impact.

Mapping of Cos with Pos and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	2	1	1	3	3	2
CO2	3	2	3	2	1	1	3	3	2
CO3	3	2	3	2	1	1	3	3	2
CO4	3	2	3	2	1	1	3	3	2
CO5	3	2	3	2	1	1	3	3	2

Question Paper Pattern

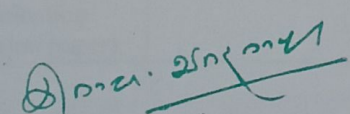
Maximum Marks: 75

Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type—One question from each unit)

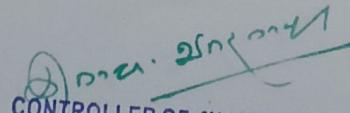
Part C: $3 \times 10 = 30$ (Three out of Five—One question from each unit)

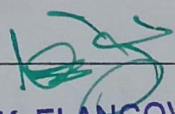

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 Rajah Serfoji Govt. College (Autonomous)
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(For students admitted from 2026-2027)

For students admitted from 2020-2021)		DISCRETE MATHEMATICS					
Title of the Course							
Paper Number		Core 15					
Category	Core	Year	III	Credits	4	Course Code	B6MA14
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	1	-		5	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To study various finite (discrete) structures of Mathematics. 2. To study recurrence relations and generating functions, analyses recurrence relations and provides methods for solving recurrence relations. 3. To introduce group codes, procedure for generating group codes and Inference theory of predicate calculus.					
Course outline		Unit –I Recurrence relations: Solution of finite order homogeneous Linear relations–Solution of Non-Homogeneous relations–Generating functions- Some common recurrence relations – Primitive recursive functions – Recursive and Partial Recursive Functions.					
		Unit –II Coding Theory: Introduction – Hamming Distance – Encoding a message – Group codes – Procedure for Generating Group codes – Decoding and Error correction – An example of single Error correcting code.					
		Unit–III Connectives – Atomic and Compound statements – Wellformed formulae – Truth table of a Formula – Tautology -Tautological Implications and Equivalence of Formulae.					
		Unit –IV Replacement Process – Normal Forms – Principal Normal Forms.					
		Unit –V Theory of inference – Open Statements - Quantifiers–Inference theory of Predicate Calculus - statements involving more than one quantifier.					
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					


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Skills acquired from the course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Web resources	https://nptel.ac.in/
Recommended Text	1. Dr. M.K.Venkataraman, Dr. N.Sridharan and N.Chandrasekharan, Discrete Mathematics, National Publishing Company, Chennai, 2001. UNIT I: Chapter 5 (Page No. 5.9 to 5.36) UNIT II : Chapter 8 (Page No. 8.1 to 8.16) UNIT III: Chapter 9 (Page No.9.4 to 9.16 & 9.21 to 9.33) UNIT IV: Chapter 9 (Page No.9.34 to 9.39 & 9.42 to 9.55) UNIT V : Chapter 9 (Page No.9.56 to 9.80 & 9.86 to 9.98)
Reference Books	1. J.P. Trembly and R.Manohar, Discrete Mathematical Structures with Applications to Computer Science, TMH Edition 1997. 2. A.R. Vasistha, A.K.Vasistha, M.A Krishnaprakasam media (P)Ltd., 2008. 3. Kenneth H. Rosen, Discrete mathematics and its applications, 7 th edition, Tata MC Grow Hill Publication. co, Ltd., New Delhi, Special Indian edition 2011.

Course Outcomes:

Students will be able to

CO1: Solve recurrence relation, linear equations and generating functions.

CO2: Understand the techniques of coding and decoding systems.

CO3: Able to get logical ideas to solve Tautology and Equivalence formulae.

CO4: Gain the knowledge of logic and normal forms.

CO5: Have exposure to the inference theory and predicate calculus.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	2	1	1	3	3	2
CO2	3	2	3	2	1	1	3	3	2
CO3	3	2	3	2	1	1	3	3	2
CO4	3	2	3	2	1	1	3	3	2
CO5	3	2	3	2	1	1	3	3	2

Question Paper Pattern

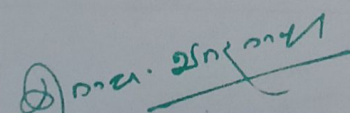
Maximum Marks: 75

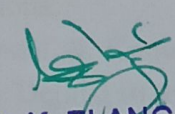
Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type – One question from each unit)

Part C: $3 \times 10 = 30$ (Three out of Five – One question from each unit)


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(For students admitted from 2026-2027)

Title of the Course		SOFT SKILLS DEVELOPMENT					
Paper Number		SEC4					
Category	SEC	Year	III	Credits	2	Course Code	B5MASE4
		Semester	VI				
Instructional Hours/per week		Lecture	Tutorial	Lab Practice	Total		
		2	-	--	2		
Objectives of the Course		• To Develop communicative competence among the Students. • To enhance the learner's soft skills by giving adequate exposure in LSRW and sub skills. • To enable learners to put the life skills into practice with confidence.					
Course Outline		UNIT-I KNOW THYSELF/UNDERSTANDING SELF: Introduction to Soft skills-Self discovery-Developing positive attitude-Improving perceptions- Forming values.					
		UNIT -II INTERPERSONAL SKILLS/ UNDERSTANDING OTHERS: Developing interpersonal relationship-Team building-group dynamics-Net working- Improved work relationship					
		UNIT-III COMMUNICATION SKILLS/COMMUNICATION WITH OTHERS: Art of listening-Art of reading-Art of speaking-Art of writing-Art of writing e-mails e mail etiquette.					
		UNIT-IV CORPORATE SKILLS/WORKING WITH OTHERS Oral Presentation Memos- Note taking Note making and preparing Minutes- Reports, Proposals, Abstracts - Technical Writing.					
		UNIT -V SELLING SELF / JOB HUNTING Writing resume/cv-interview skills-Group discussion- Mock interview-Mock GD-Goal setting - Career planning					
Reference Books		1. N. Krishnasamy, Manju Dhariwel and Lalitha Krishnasamy (2015). Mastering Communication Skills and Soft Skills - Bloomburg. 2. Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A RoadMap to Success), P.R. Publishers & Distributors, 3. Meera Banerjee and Krishna Mohan: Developing Communication Skills, Trinity Publishers-(Lakshmi Publications). 4. Alex K. (2012) Soft Skills Know Yourself & Know the World, S.Chand & CompanyLTD, Ram Nagar, New Delhi-110 055.					

(For students admitted from 2026-2027)

Course Outcome

Students will be able to

CO 1: Develop listening, speaking, reading and writing skills in English.

CO 2: Enhance soft skills and engage in a range of communicative tasks and activities

CO 3: Comprehend a text and identify specific and global information

CO 4: Promote communicative ability in both spoken and written form of the language

CO 5: Develop interpersonal skills to maintain human relationship and develop corporate skills to promote leadership qualities and team spirit.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	2	1	1	3	3	2
CO2	3	2	3	2	1	1	3	3	2
CO3	3	2	3	2	1	1	3	3	2
CO4	3	2	3	2	1	1	3	3	2
CO5	3	2	3	2	1	1	3	3	2

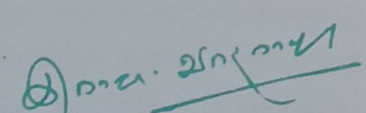
Question paper pattern

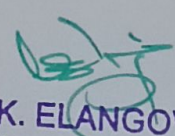
Maximum Marks: 75

Examination Duration: 3 Hours

Part – A 5X6 =30 Marks Either or type – (Two questions from each unit)

Part–B 3X15=45 Marks (Three out of Five and One question from each Unit)


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Credits : 2

Hours/Week : 2

Medium of Instruction : English / Tamil

Code: B6GS

இனநிலை பட்ட வகுப்பு - பகுதி - IV

(2026 - 2027 ஆம் கல்வியாண்டு முதல் சேர்க்கப்பட்ட மாணவர்களுக்குரியது)

ஆறாம் பருவம்

பாலின சமத்துவம் (Gender Studies)

Course Objectives

1. To make boys and girls aware of each other strengths and Weakness.
2. To develop sensitivity towards both genders in order to lead an ethically enriched life.
3. To promote attitudinal change towards a gender balanced ambience and women empowerment.

அலகு - 1

பாலினம் தொடர்பான கோட்பாடுகள்: பாலியல் - பாலினம் - உற்சூறாத்தியாக நிர்ணயித்தல் - ஆணாதிக்கம் - பெண்ணியம் - பாலின பாகுபாடு - பாலின வேலைப்பாகுபாடு - பாலின ஒருபடித்தானவைகள் - பாலின உணர்வுபட்டல் - பாலின சமவாய்ப்பு - பாலின சமத்துவம் - பாலின மையநீரோட்டமாக்கல் - அதிகாரப்படுத்துதல்.

அலகு - 2

மகளிரியல் Vs பாலின சமத்துவக்கல்வி - பல்கலைக்கழக மானியக்குழுவின் வழிகாட்டுதல்கள் - ஏழாவது ஐந்தாண்டுத் திட்டம் முதல் பதினோராவது ஐந்தாண்டுத் திட்டம் - பாலின சமத்துவக்கல்வி: பெய்ஜிங் மாநாடு மற்றும் பெண்களுக்கு எதிரான அனைத்து வன்முறைகளையும் ஒழிப்பதற்கான சர்வதேச உடன்படிக்கை - இணைத்தல் / உட்படுத்துதல் - ஒதுக்கல்.

அலகு - 3

பாலியல் பாகுபாட்டிற்கான தளங்கள்: குடும்பம் - பாலின விகிதாச்சாரம் - கல்வி - ஆரோக்கியம் - ஆளுமை - மதம் - வேலை Vs வேலை வாய்ப்பு - சந்தை - ஊடகங்கள் - அரசியல் - சட்டம் - குடும்ப வன்முறை - பாலியல் துன்புறுத்தல் - அரசு கொள்கைகள் மற்றும் திட்டங்கள்.

அலகு - 4

பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு: முயற்சிகள் - சர்வதேச பெண்களுக்கான தசாப்தம் - சர்வதேச பெண்கள் ஆண்டு - பெண்களின் மேம்பாட்டிற்கான தேசிய கொள்கை - பெண்கள் அதிகார ஆண்டு 2001 - சர்வதேச கொள்கைகளை மைய நீரோட்டமாக்கல்.

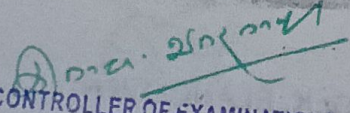

Dr.K. ELANGOVAN

Head & Associate Professor

Department of Mathematics

Rajah Serfoji Govt. College (Autonomous)

Thanjavur - 613005


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THANJAVUR-613 005.

அலகு - 5

பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு நிறுவன ஏற்பாடுகள்: தேசிய மற்றும் மாநில மகளிர் ஆணையம் - அனைத்து மகளிர் காவல் நிலையங்கள் - குடும்ப நீதி மன்றங்கள் - குடும்ப வன்முறையிலிருந்து பெண்களைப் பாதுகாக்கும் சட்டம் 2005 - பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களை தடுப்பதற்கான உச்சநீதிமன்ற வழிகாட்டுதல்கள் - தாய்சேய் சேமநலச் சட்டம் பெண்களின் கருவிலேயே கண்டறியும் தொழில் நுட்பம் (முறைப்படுத்துதல் மற்றும் தவறாக பயன்படுத்துதலை தடை செய்திடும்) சட்டம் - ஈவ்ஃசிங் (பெண்களை தொல்லை செய்தல்) தடுப்புச் சட்டம் - சுய உதவிக் குழுக்கள் - பஞ்சாயத்து அமைப்புகளுக்கான 73வது மற்றும் 74வது சட்டத்திருத்தம்.

REFERENCE BOOKS

1. Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publication, 2003
2. Misra Geetanjali, Chandiramani Radhika (ed.), Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi : Sage Publication, 2005
3. Krishna Sumi, (ed.), Livelihood and Gender: Equity in Community Resource Management, New Delhi : Sage Publication, 2004
4. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999

Course Outcomes		Cognitive level
At the end of the course, the students will be able to		
CO-1	Understand the problems of gender bias in the society	Understanding
CO-2	Know and Recollect the legal safety measures available to protect from the gender discrimination	Remembering
CO-3	Analyse the ways in which social institutions and power structures impact the material realities of women's lives	Remembering
CO-4	Demonstrate an openness to learn the views from the view of a women	Applying
CO-5	Develop equitable and just thinking towards women	Applying

Question Paper Pattern

Maximum Marks : 75

Exam Duration : 3 Hours

Part A - 5 x 6 = 30 (5 Out of 7 atleast 1 Question from each Unit)

Part B - 3 x 15 = 45 (3 Out of 5 atleast 1 Question from each Unit)

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THANJAVUR-613 005.

Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Sertoji Govt. College (Autonomous)
Thanjavur - 613005

SYLLABUS

FOR

LIST OF ELECTIVE COURSES PART – B (DISCIPLINE)

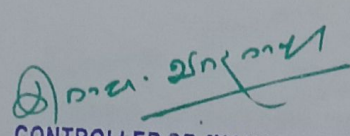
(for the candidates admitted from the academic year 2026-2027 onwards)

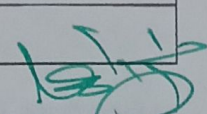
Part – B (Discipline)

S. No.	Course Code	Title of the Course
1.	BMAECA	Numerical Methods with Applications
2.	BMAECB	Mathematical Modeling
3.	BMAECC	Introduction to Python
4.	BMAECD	Graph Theory and its applications
5.	BMAECE	Formal Languages and Automata Theory
6.	BMAECF	Linear algebra
7.	BMAECG	Fuzzy sets and Fuzzy logic
8.	BMAECH	Statistics with R Programming - Practical

(For students admitted from 2026-2027)

Title of the Course		NUMERICAL METHODS WITH APPLICATIONS					
Paper Number		EC 1A					
Category	EC	Year	III	Credits	4	Course Code	BMAECA
		Semester	V				
Instructional Hours per week		Lecture	Tutorial	Lab Practice	Total		
		3	1	--	4		
Objectives of the Course		• To develop the mathematical skills of the students in the areas of numerical methods. • To provide the student with numerical methods of solving the Interpolation, differentiation and integration. • This course is an introduction to broad range of numerical methods for solving mathematical problems that arise in science and engineering.					
Course Outline		UNIT-I: Algebraic and Transcendental equations – Finding the solution of the given equation using bisection method, Method of false position, Newton-Raphson method, Iteration method.					
		UNIT-II: Finite differences – Forward, Backward and central differences – Newton's Forward and backward difference interpolation formulae– Interpolation with unevenly spaced points–Lagrange's interpolation formula.					
		UNIT-III: Numerical Integration- Using Trapezoidal rule and simpson's 1/3 and 3/8-rules.					
		UNIT-IV: Solution to Linear systems–Gauss Elimination method– Jacobi and Gauss Siedal iterative methods.					
		UNIT-V: Numerical solution of ODE Solution by Taylor's series method, Picard's method, Euler's method, Runge - kutta second and fourth order methods.					
Extended Professional Component		Questions related to the above topics, from various competitive examinations UPSC / TNPSC / others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Web resources		https://nptel.ac.in/					


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RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
THANJAVUR-613 005.


Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	S.S Sastry, Introductory methods of Numerical Analysis, Prentices Hall of India Pvt.Limited,2001,Third Edition. UNIT I : Chapter2(sections2.2,2.3,2.4,2.5) UNIT II : Chapter3(sections 3.3.1,3.3.2,3.3.3, 3.6,3.9,3.9.1) UNIT III : Chapter5(sections5.4, 5.4.1,5.4.2,5.4.3) UNIT IV : Chapter6(sections6.3,6.3.2)and Chapter8(sections8.3.1 ,8.3.2) UNIT V : Chapter7(sections7.1,7.2,7.3,7.4,7.5).
Reference Books	[3] S.Narayanan and others, Numerical Analysis, S.Viswanathan Publishers, 1994, [4] A.Singaravelu, Numerical methods, Meenachi Agency,June2000. [5] E.Kendall, Atkinson, An Introduction to Numerical Analysis, II Edition, John wiley & Sons, 1989.

Course Outcome

The students will be able to

CO1: Learn the numerical methods to find our solution of algebraic equations using different methods.

CO2: Understand the various interpolation methods and finite difference concepts.

CO3: Apply numerical methods to obtain approximate solutions to mathematical problems.

CO4: Work numerically on the ordinary differential equations using different methods through the theory of finite differences.

CO5: Apply Taylor series and Runge kutta methods to find the solution of the equations.

Mapping of Cos with POs and PSOs:

CO	POs						PSOs		
CO1	3	1	3	1	-	-	3	2	1
CO2	2	1	3	1	2	=	3	2	1
CO3	3	1	3	3	-	-	3	3	1
CO4	3	1	3	3	-	-	3	3	1
CO5	3	1	3	3	2	-	3	3	1

Question Paper Pattern

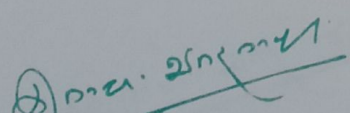
Maximum Marks: 75

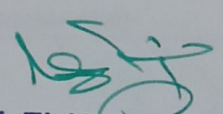
Examination Duration:3Hours

Part A:10 ×2=20 (Two questions from each unit)

Part B: 5×5=25 (Either / Or type–One questions from each unit)

Part C: 3×10=30 (Three out of Five–One questions from each unit)

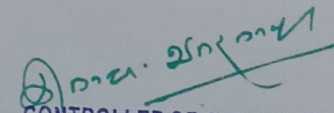

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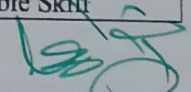

Dr.K. ELANGO
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

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(For students admitted from 2026-2027)

Title of the Course		MATHEMATICAL MODELLING					
Paper Number		EC1B					
Category	EC	Year	III	Credits	4	Course Code	BMAECB
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		3	1	-		4	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. Construction and Analysis of Mathematical models found in real life problems. 2. Modeling through differential and difference equations					
Course outline		Unit –I Mathematical modeling through ordinary differential equations of first order – Linear growth and Decay models – Non-linear growth and Decay models – Compartment models – Dynamics problems – Geometrical problems.					
		Unit –II Mathematical modeling through systems of ordinary differential equations of first order – Population dynamics – Epidemic – Compartment models – Economics – Medicine, arms rays, battles and international trade - Dynamics.					
		Unit– III Mathematical modeling through ordinary differential equations of second order: Planetary motions – Circular motions and motion of satellites – Mathematical modeling through linear differential equations of second order –Miscellaneous mathematical models.					
		Unit –IV Mathematical modeling through difference equations: Simple models – Basic theory of linear difference equations with constant co-efficient – Economics and finance – Population dynamics and genetics – Probability theory.					
		Unit –V Mathematical modeling through graphs: solutions that can be modeled through graphs – Mathematical modeling in terms of directed graphs, Signed graphs, Weighted digraphs and Unoriented graphs.					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC – CSIR/ GATE/ TNPSC/ others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					


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 THANJAVUR-613 005.


Dr.K. ELANGOVAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	1. J N Kapur, Mathematical Modeling, New Age International publishers (2009). UNIT I: Chapter 2 (Sec. 2.1 - 2.6) UNIT II : Chapter 3 (Sec.3.1 - 3.3 & 3.5) UNIT III: Chapter 4 (Full) UNIT IV: Chapter 5 (Sec. 5.1 – 5.5) UNIT V : Chapter 7 (Full)
Reference Books	1. Mathematical Modeling by Bimalk. Mishra and Dipak K.Satpathi. Ane Books Pvt. Ltd(1 January 2009) 2. Mathematical Modeling Models, Analysis and Applications, by Sandip Banerjee, CRC Press, Taylor & Francis group, 2014 3. Mathematical Modeling applications with Geogebra by Jonas Hall & Thomas Ligefjard, John Wiley & Sons, 2017 4. Mark M. Meerschaert: Mathematical Modeling, Elsevier Publ., 2007.
Web resources	https://nptel.ac.in/

Course Outcome

Students will be able to

CO 1: Explain simple situations requiring Mathematical Modeling and to Determine the characteristics of such models

CO 2: Model using differential equations in-terms of linear growth and Decay models

CO 3: Model using systems of ordinary differential equations of first order, to discuss about various models under the categories 'Epidemics' and 'Medicine'

CO 4: Explain in detail about difference equations

CO 5: Model using difference equations

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	2	3	3	3	2	2	2	3	2
CO2	2	3	3	3	2	2	2	3	2
CO3	2	3	3	3	2	2	2	3	2
CO4	3	2	2	2	-	1	2	3	2
CO5	2	3	3	3	2	2	2	3	2

Question Paper Pattern

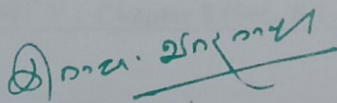
Maximum Marks: 75

Examination Duration: 3Hours

Part A: 10 × 2 = 20 (Two questions from each unit)

Part B: 5 × 5 = 25 (Either / Or type—One questions from each unit)

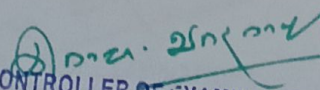
Part C: 3 × 10 = 30 (Three out of Five—One questions from each unit)

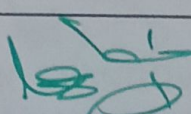

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THANJAVUR-613 005.


Dr.K. ELANGOAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

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Title of the Course		INTRODUCTION TO PYTHON					
Paper Number		EC1C					
Category	EC	Year	III	Credits	4	Course Code	BMAECC
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		3	1		-		4
Pre-requisite		Basic Knowledge of Programming concept					
Objectives of the Course		1. Describe the core syntax and semantics of Python programming language. 2. Discover the need for working with the strings and functions. 3. Illustrate the process of structuring the data using lists, dictionaries, tuples and sets. 4. Understand the usage of packages and Dictionaries.					
Course outline		Unit –I Introduction – Python Overview – Getting Started with python – Comments – python Identifiers – Reserved keywords – Variables – Standard Data Types – Operators – Statement and Expressions – String Operations – Boolean Expressions.					
		Unit –II Control Statement – Iteration – While statement – Input from keyboard.					
		Unit–III Introduction – Built-in Functions – Composition of Functions – Parameters and Arguments – Function Calls – The return statement – Python Recursive Function – The anonymous Functions.					
		Unit –IV Text files – Directories					
		Unit –V Overview of OOP – Class definition – Creating Objects – Objects as Arguments – Objects as Return Values – Built-in Class Attributes – Inheritance – Method Overriding – Data Encapsulation – Data Hiding					
Extended Professional Component		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		E Balagurusamy, “Introduction to Computing and Problem Solving Using Python”, 1 st Edition, McGraw Hill India, 2016 UNIT I: Chapter 3 (Sec. 3.1 – 3.12) UNIT II : Chapter 3 (Sec. 3.13 , 3.15) UNIT III: Chapter 4 (Sec. 4.1 – 4.9) UNIT IV: Chapter 7 (Sec. 7.1 – 7.2) UNIT V : Chapter 8 (Sec. 8.1 – 8.10)					


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 THANJAVUR-613005.


 Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

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Reference Books	1. Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem solving Focus", Wiley India Edition, 2015. 2. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education, 2016 3. Mark Lutz, "Learning Python Powerful Object Oriented Programming", O'reilly Media 2018, 5th Edition. 4. Timothy A. Budd, "Exploring Python", Tata MCGraw Hill Education Private Limited 2011, 1 st Edition. 5. John Zelle, "Python Programming: An Introduction to Computer Science", Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1590282410 6. Michel Dawson, "Python Programming for Absolute Beginners", Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009
Website and e-Learning Source	https://nptel.ac.in/ , https://onlinecourses.swayam2.ac.in/cec22/cs22/preview

Course Outcome

Students will be able to

CO1: develop and execute simple Python programs.

CO2: write simple Python programs using conditionals and looping for solving problems.

CO3: decompose a Python program into functions.

CO4: read and write data from/to files in Python programs.

CO5: use of Classes and Objects in python.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	2	1	3	1	-	-	3	2	1
CO3	3	1	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	3	1	3	-	-	-	3	2	1

Question Paper Pattern

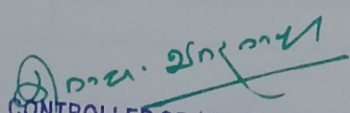
Maximum Marks: 75

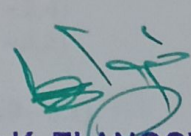
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

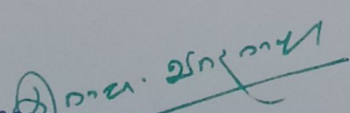
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)


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Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

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Title of the Course		GRAPH THEORY AND ITS APPLICATIONS					
Paper Number		EC2D					
Category	EC	Year	III	Credits	3	Course Code	BMAECD
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		3	1		-		4
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. Be familiar with the most fundamental graph theory topics and results. 2. Be exposed to the techniques of proofs and analysis.					
Course outline		Unit –I Graphs and Subgraphs: Introduction-The Konigsberg Bridge problem – Definitions and Examples – Degrees – Subgraphs– Isomorphism. Unit –II Independent sets and coverings – Intersection Graphs and line graphs – matrix representation of graphs – operations on graphs – Degree sequences – Graphic sequences. Unit–III Connectedness: Introduction – Walks,Trails and Paths – Connectedness and Components – Blocks- Connectivity. Unit –IV Eulerian, Hamiltonian Graphs and Trees: Introduction – Eulerian graphs –Hamiltonian graphs – Characterization of Trees Unit –V Planarity: Introduction – Definition and Properties- Characterization of planar graphs.					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC – CSIR/ GATE/ TNPSC/ others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		Dr. S.Arumugam and Dr.S.Ramachandran , Invitation to Graph Theory , Scitech Publications India Pvt Limited, Chennai 2001. Unit I: Chapter 1(Sec 1.0, 1.1) &Chapter 2 (Sec2.0 - 2.4) Unit II: Chapter 2(Sec2.6-2.9) & Chapter 3 (Sec3.1 - 3.2) Unit III: Chapter 4 (Sec4.0 - 4.4) Unit IV: Chapter 5 (Sec5.0 - 5.2) &Chapter 6 (Sec6.0 - 6.1) Unit V: Chapter8 (Sec8.0 - 8.1)					


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 Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
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(For students admitted from 2026-2027)

Reference Books	1. Graph Theory, Narsingh Deo, PHI Pvt. Ltd., New Delhi (2002). 2. K.R Parthasarathy, Basic Graph Theory, Tata Mcgraw Hill Publishing Company, New Delhi, 1994. 3. G.T John Clark, Derek Allan Holten, A First Look at Graph Theory, World Scientific Publishing company, 1995. 4. G.Chartrand, Linda Lesniak and Ping zhang, Graphs and Digraphs, Fifth Edition, CRC press, 2011.
Website and e-Learning Source	https://nptel.ac .

Course Outcomes:

Students will be able to

- CO1:** Define basic notions in graph theory and account for the theory of paths and the degree of connectedness of a graph.
- CO2:** Account the basic properties of Covering and operations on graphs, Understand the matrix representation of graphs.
- CO3:** After learning the course the students should be able to solve problems involving vertex connectivity, edge connectivity.
- CO4:** Define the Eulerian and Hamiltonian graphs with their properties.
- CO5:** Understand the Planarity of graphs and their properties.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	2	1	3	1	-	-	3	2	1
CO3	3	1	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	3	1	3	-	-	-	3	2	1

Question Paper Pattern

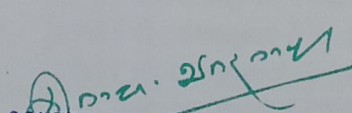
Maximum Marks: 75

Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

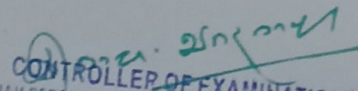
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

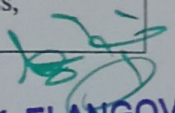

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 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomo
 Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		FORMAL LANGUAGES AND AUTOMATA THEORY					
Paper Number		EC2E					
Category	EC	Year	III	Credits	3	Course Code	BMAECE
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		3	1	-		4	
Pre-requisite		Basic Knowledge in Mathematics					
Objectives of the Course		1. To impart knowledge in Finite automata, regular languages, regular grammars, context free grammars, languages, and pushdown automata which play a crucial role 2. To Identify different formal language classes and their relationship.					
Course outline		Unit –I Finite Automata –Deterministic Finite Automata - Nondeterministic Finite Automata - Application. Unit –II Regular Expressions - Finite Automata and Regular Expressions- Applications of Regular Expressions - Algebraic Laws for Regular Expressions. Unit–III Pumping lemma for regular sets – Closure properties of regular sets – Decision algorithms for regular sets – Equivalence and Minimization of Automata. Unit –IV Context- free grammars – Parse trees – Applications of Context - free grammars –Ambiguity in grammars and languages. Unit –V Pushdown Automata – Languages of a PDA – Equivalence of PDA's and CFG's – Deterministic PDA.					
Extended Professional Component(is a part of internal only)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					
Recommended Text		John E.Hopcroft and Jeffrey D.Ullman, Introduction to Automata Theory, Languages and Computation, Narosa Publishing House, New Delhi, (1995). UNIT I: Chapter 2 (Sec 2.1 -2.4) UNIT II: Chapter 3 (Sec 3.1-3.4) UNIT III: Chapter 4 (Sec 4.1 -4.4) UNIT IV: Chapter 5 (Sec 5.1-5.4) UNIT V: Chapter 6 (Sec6.1 -6.4)					
Reference Books		1. Rani Siromoney, Formal Languages and Automata, The Christian Literature Society, Madras (1984). 2. Bernard Kolman, Robert C.Busby and Sharon Cutler Ross,					


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 THANJAVUR-613 005.


 Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
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	3. Discrete Mathematical Structures, Prentice-Hall of India 4. Learning Private Ltd, New Delhi, Sixth Edition, (2009). 5. Kamala Krithivasan, Introduction to Formal Languages, Automata Theory and Computation, Dorling Kindersley (India) Pvt. Ltd. (2011).
Website and e-Learning Source	https://nptel.ac .

Course Outcome :

Students will be able to

- CO1:** acquires a fundamental understanding of the core concepts in automata theory and formal languages.
- CO2:** design grammars and automata for different language classes.
- CO3:** describe the types of grammar and derivation tree.
- CO4:** apply context-free languages, push-down automata.
- CO5:** design automata, regular expressions and context-free grammars accepting or generating a certain language.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	2	2	2	2	2	2	2	2	3
CO2	2	3	2	3	3	3	2	2	2
CO3	2	2	3	3	3	3	2	3	3
CO4	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3

Question Paper Pattern

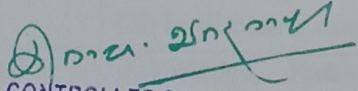
Maximum Marks: 75

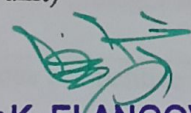
Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

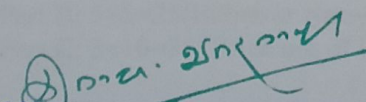
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

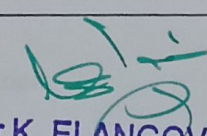

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Dr.K. ELANGO
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		LINEAR ALGEBRA						
Paper Number		EC2F						
Category	EC	Year	III	Credits	3	Course Code	BMAECF	
		Semester	VI					
Instructional Hours per week		Lecture		Tutorial		Lab Practice		Total
		3		1		--		4
Pre-requisite		12 th Standard Mathematics						
Objectives of the Course		• Vector Spaces, linear dependence and independence of vectors. Dual spaces, Inner product and norm–orthogonalization process. • Linear transformations. Various operators on vector spaces						
Course Outline		UNIT-I: Vector spaces – Subspaces – Linear Combinations and linear span - Systems of Linear equations – Homogenous Equations – Non-homogenous Equations – Elementary Matrices – Row reduced - Echelon form						
		UNIT-II: Linear Dependence and Linear independence – Bases – Dimensions						
		UNIT-III: Linear transformations, null spaces and ranges – Matrix representation of a linear transformation –invertibility and isomorphisms – Dual spaces.						
		UNIT – IV: Eigen values, eigen vectors, diagonalizability – invariant subspaces – Cayley– Hamilton theorem.						
		UNIT-V: Inner products and norms – Gram Schmidt Orthogonalization Process - Orthogonal complements.						
Extended Professional Component		Questions related to the above topics, from various competitive examinations UPSC / TNPSC / others to be solved (To be discussed during the Tutorial hour)						
Skills acquired from this course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill						


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 RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
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Recommended Text	Linear Algebra – Stephen H Friedberg, Arnold J Insel and Lawrence E Spence, 5 th edition (2018) Pearson Unit I: Chapter 1 (Sec 1.1 – 1.4) Unit II: Chapter 1 (Sec 1.5 – 1.6) Unit III: Chapter 2: (Sec 2.1 – 2.4, 2.6) Unit IV: Chapter 5 (Sec 5.1 – 5.2) Unit V: Chapter 6 (Sec 6.1 – 6.2)
Reference Books	1. I.N.Herstein, Topics in Algebra, Wiley Eastern Ltd. Second Edition, 2006. 2. N.S.Gopalakrishnan, University Algebra, New Age International Publications, Wiley Eastern Ltd. 3. John B.Fraleigh, First course in Algebra, Addison Wesley. 4. Stephen H. Friedberg, Arnold J. Insel, Lawrence E.Spence, Linear Algebra, 4 th Ed., Prentice Hall of India Pvt. Ltd., New Delhi, 2004.
Website and e-Learning Source	https://nptel.ac

Course Outcome

Students will be able to

CO1: Acquire a detailed knowledge about vector spaces and subspaces

CO2: Explain the concepts of Linear Dependence, Linear Independence, Bases and Dimension of basis

CO 3: Explain the concept of Linear Transformations, their Matrix representation and the notion of dual spaces

CO4: Find the Eigen values and Eigen vectors, to apply the concepts for diagonalisation

CO5: Explain about Inner product and norms and to apply Gram Schmidt Orthogonalization Process to problems on inner product spaces

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	3	2	3	-	-	3	3	1
CO2	3	3	3	3	-	-	3	3	1
CO3	3	3	2	3	1	-	3	3	1
CO4	3	3	3	3	-	-	3	3	1
CO5	3	3	3	3	1	-	3	3	1

Question Paper Pattern

Maximum Marks: 75

Examination Duration: 3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type – One question from each unit)

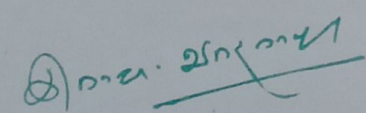
Part C: $3 \times 10 = 30$ (Three out of Five – One question from each unit)

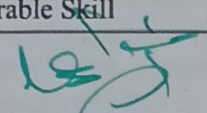
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Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
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(For students admitted from 2026-2027)

Title of the Course		FUZZY SETS AND FUZZY LOGIC					
Paper Number		EC2G					
Category	EC	Year	III	Credits	3	Course Code	BMAECG
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		3	1		-		4
Pre-requisite		Basic mathematical concepts and logics.					
Objectives of the Course		1. To enable the students understand the need of fuzzy sets 2. To make the learners attain comprehensive acquisition of fuzzy operations and relations 3. To assist the stake holders in acquisition of the applications of fuzzy logic in real life situations					
Course outline		Unit –I Crisp set operations on crisp sets - Fuzzy sets - representation of a fuzzy set-representation of membership function types of fuzzy sets -cut of a fuzzy set-a-cut decomposition - some more definitions.					
		Unit –II Operations on fuzzy sets- properties of operation on fuzzy sets - first and second decomposition theorems - product on fuzzy sets.					
		Unit–III Fuzzy numbers - linguistic variables - fuzzy arithmetic - properties on interval valued arithmetic operations -operations on fuzzy numbers - fuzzy equations - lattice of fuzzy numbers.					
		Unit –IV Classical logic-logical connectives - truth values and truth tables - fuzzy logic-fuzzy logic truth tables - fuzzy connectives.					
		Unit –V Relation on fuzzy sets-representation - composition of fuzzy relations -max-min composition properties - fuzzy equivalence relation.					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC – CSIR/ GATE/ TNPSC/ others to be solved (To be discussed during the Tutorial hour)					
Skills acquired from the course		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill					


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 THANJAVUR-613 005.


Dr.K. ELANGO
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	1.D S Hooda and Vivek Raich, Fuzzy Set Theory and Fuzzy Control, Narosa Publishing House, New Delhi, 2015 2.George J. Klir and Bo Yuan, Fuzzy Sets and Fuzzy Logic Theory and Applications, PHI Learning Private Limited, New Delhi, 2009. Unit I: Chapter 1 (Sec 1 – 5) [1] Unit II: Chapter 1(Sec 6 – 8) [1] Unit III: Chapter 4 (Sec 1 - 5)[2] Unit IV: Chapter 3 (Sec 1 – 4 and 7- 9) [1] Unit V: Chapter 4 (Sec 1 – 4) [1]
Reference Books	3. Zimmermann, Fuzzy set theory and its applications, Affiliated East West Press Pvt Ltd, 2nd Edition, 1996. 4. M. Murugalingam and Others, Introduction to Fuzzy Algebra, Sivam Publications, Vikramasingapuram, 2006.
Web resources	https://nptel.ac.in/ https://swayam2.ac.in

Course Outcome :

Students will be able to

CO1: understand the membership function and fuzzy set

CO2: work on the operations on fuzzy set

CO3: skilled in fuzzy properties and fuzzy equations

CO4: gain knowledge of fuzzy logic and fuzzy connectives

CO5: realize fuzzy relations.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	1	3	-	-	-	3	2	1
CO2	2	1	2	2	-	-	3	2	1
CO3	2	2	3	1	-	-	3	2	1
CO4	3	1	3	-	-	-	3	2	1
CO5	2	2	3	1	-	-	3	2	1

Question Paper Pattern

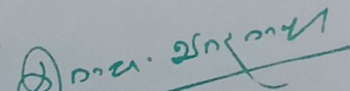
Maximum Marks: 75

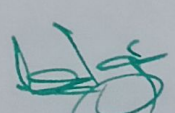
Examination Duration:3 Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type–One question from each unit)

Part C: $3 \times 10 = 30$ (Three out of Five –One question from each unit)


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(For students admitted from 2026-2027)

Title of the Course		STATISTICS WITH R PROGRAMMING PRACTICAL					
Paper Number		EC2H					
Category	EC	Year	III	Credits	3	Course Code	BMAECH
		Semester	VI				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
			-		3		3
Objectives of the Course		1. Use R for statistical programming, computation, graphics and modelling 2. Write functions and use R in an efficient way Fit some basic types of statistical models					
Course outline		1. Plotting Bar chart and scatter plot 2. Plotting histogram and pie chart 3. Plotting Box and Matrix plot 4. Measures of central tendency -Mean, median, mode 5. Measures of Dispersion- std. deviation, mean deviation 6. Regression and correlation. Linear models. 7. Binomial Distribution 8. Poisson Distribution 9. One Small sample t - test 10. Two Small sample Z – test 11. Chi = square test 12. Type – I Error and II - Error					
Recommended Text		1. Tilman M. Davies, The Book of R - A First Course in Programming and Statistics, Copyright © 2016 by Tilman M. Davies.					
Reference Books		1.Allerhand M. Tiny Handbook of R – Springer Briefs in Statistics, 2011 2.Baayen R. Analyzing Linguistic Data - A Practical Introduction to Statistics using R, 2008. 3.Gardener M. Beginning R - The Statistical Programming Language, 2012. 4..Jim Albert, Maria Rizzo R by Example, 2012.Matloff N. Art of R Programming - A Tour of Statistical Software Design, 2011.					

Question Paper Pattern

Maximum Marks: 75

Examination Duration: 3 Hours

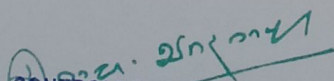
Answer All The Questions

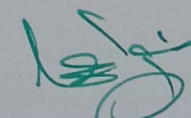
1 X 15 = 15 Marks

2 x 25 = 50 Marks

Record = 5 Marks

Viva voce = 5


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Dr. K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

SYLLABUS

FOR

ALLIED MATHEMATICS PAPERS

**(PHYSICS, CHEMISTRY, STATISTICS AND
COMPUTER SCIENCE MAJOR)**

(for the candidates admitted from the academic year 2026-2027 onwards)



RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS), THANJAVUR - 613005

DEPARTMENT OF MATHEMATICS ALLIED PAPERS

(for the candidates admitted from the academic year 2026-2027 on wards)

For PHYSICS & CHEMISTRY Major Students										
Sem.	Part	Course	Subject Code	Title of the Paper	In Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
I	III	Allied1	B1AMA1	Algebra and Differential Calculus	4	3	3	25	75	100
I&II	III	Allied2	B2AMA2	Vector Analysis and Analytical Geometry	3	-	-	-	-	-
Total					7	3				100
II	III	Allied2	B2AMA2	Vector Analysis and Analytical Geometry	3	3	3	25	75	100
	III	Allied3	B2AMA3	Integral Calculus, Fourier Series and Laplace Transforms	4	3	3	25	75	100
	Total				7	6				200

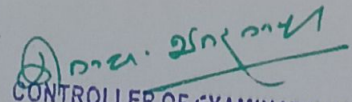
For STATISTICS Major Students										
Sem.	Part	Course	Subject Code	Title of the Paper	In Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
I	III	Allied1	B1AMAST1	Differential Calculus and Matrices	4	3	3	25	75	100
I&II	III	Allied2	B1AMAST2	Integral Calculus and Analytical Geometry	3	-	-	-	-	-
Total					7	3				100
II	III	Allied2	B1AMAST2	Integral Calculus and Analytical Geometry	3	3	3	25	75	100
	III	Allied3	B2AMAST3	Vector Analysis and Laplace Transforms	4	3	3	25	75	100
	Total				7	6				200

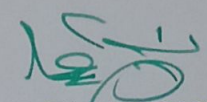
For COMPUTER SCIENCE Major Students										
Sem.	Part	Course	Subject Code	Title of the Paper	In Hrs.	Credit	Exam. Hrs.	Marks		Total
								Int.	Ext.	
I	III	Allied1	B1AMACS1	Numerical methods and Operations Research	4	3	3	25	75	100
I&II	III	Allied2	B2AMACS2	Probability and Statistics	3	-	-	-	-	-
Total					7	3				100
II	III	Allied2	B2AMACS2	Probability and Statistics	3	3	3	25	75	100
	III	Allied3	B2AMACS3	Discrete Mathematics	4	3	3	25	75	100
	Total				7	6				200

(For students admitted from 2026-2027)

(Continued from 2020-2021)

Title of the Course		ALLIED PAPER-I ALGEBRA AND DIFFERENTIAL CALCULUS (FOR PHYSICS AND CHEMISTRY MAJOR)					
Paper Number		ALLIED I					
Category	Allied	Year	I	Credits	3	Course Code	BIAMA1
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	-	-		4	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		- To train a complete treatment of differential calculus and algebraic concepts (series and matrices) and techniques for a firm understanding of the proofs. - To make ability to apply the results to the related problems.					
Course outline		Unit-I Matrices: Symmetric, Skew-Symmetric matrices-Hermitian and Skew – Hermitian matrices – Unitary Matrices-Orthogonal matrices-Problems Unit-II Matrices: Eigen values and Eigenvectors-Cayley-Hamilton theorem (Proof excluded)-Verification of Cayley-Hamilton theorem. Unit -III Successive differentiation-Leibnitz's theorem (Proof excluded) and its applications. Unit -IV Partial differentiation Partial derivatives – Successive partial derivatives – Function of a function rule- Total differential coefficient- A special case – Implicit Functions. Unit -V Curvature-Radius of Curvature in Cartesian Co-ordinates-Centre of Curvature.					
Recommended Text		1. Algebra(VolumeII),T.K.Manickavachagom Pillay, T.Natarajan and K.S.Ganapathy, S.Viswanathan, Pvt.Ltd, (2015). 2. Calculus (Volume I), S.Narayanan and T.K.Manickavachagom Pillay, S.Viswanathan, Pvt., Ltd (2013). Unit I: Chapter 2 (Sec 6.1-6.3,9.1)[1] Unit II: Chapter 2 (Sec 16,16.3)[1] Unit III: Chapter 3 (Sec. 1.1- 1.6, 2.1 -2.2)[2] Unit IV: Chapter 8 (Sec. 1.1- 1.5)[2] Unit V: Chapter 10 (Sec. 2.1, 2.3, 2.4)[2]					


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 THANJAVUR-613 005.


Dr.K. ELANGO VAN
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 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

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Course Outcomes:

Students will be able to

CO1: recall Symmetric, Skew Symmetric Hermitian, Skew-Hermitian, Unitary and Orthogonal Matrices.

CO2: explain the concepts of Eigen values, Eigen vectors and solve the Cayley-Hamilton theorem based problems

CO3: understand the derivatives of successive differentiation, Leibnitz theorem and their applications.

CO4: describe the partial derivatives and total differential coefficient

CO5: compute the equation for centre and radius of curvature by using Cartesian formula and polar coordinates

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	2	3	2	1	2	3	3	2	2
CO2	3	2	2	2	1	2	3	2	2
CO3	1	3	2	2	3	3	3	2	2
CO4	1	2	3	2	3	2	3	2	3
CO5	1	2	2	2	3	2	3	2	2

Question Paper Pattern

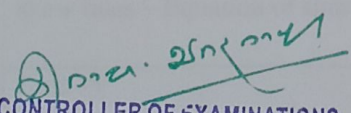
Maximum Marks: 75

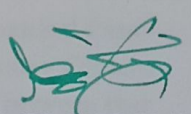
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)


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THANJAVUR-613 005.


Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-II VECTOR ANALYSIS AND ANALYTICAL GEOMETRY (FOR PHYSICS AND CHEMISTRY MAJOR)					
Paper Number		ALLIED 2					
Category	Allied	Year	I	Credits	3	Course Code	B2AMA2
		Semester	I & II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		6	-	-		6	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		- To teach the concepts of Vector differentiation, Vector integration and its applications and Analytical geometry of three dimensions for a firm understanding of the subjects. - To make ability to apply it in scientific concepts.					
Course outline		Unit-I Vector differentiation: - Differentiation of vectors- A few results on differentiation of vectors- Gradient of a vector -Directional derivative-divergence and curl of a vector- Solenoidal and Irrotational vector. Unit-II Gauss Divergence Theorem- Stoke's Theorem -Simple problems- Verification of the above theorems (Proof excluded). Unit-III Plane: Standard equation of the plane-Intercept form-Normal form- Plane passing through the given points -Angle between the planes - Plane through the line of intersection of two planes Unit -IV Straight line: Equation of a straight line in symmetrical form - Equation of a straight line passing through two given points - Coplanar lines - Equation of the Coplanar lines-Shortest distance between two skew lines - Equation of shortest distance. Unit -V Sphere: Standard equation - Length of the tangent from any point - Plane section of a sphere - Sphere passing through a given circle - Intersection of two spheres-Equation of the tangent plane to the sphere					

(For students admitted from 2026-2027)

Recommended Text	1. Vector Algebra and Analysis, T.K.Manickavachagom Pillay and T. Natarajan, Ananda book depot(2022) 2. Analytical Geometry (Three Dimensions), T.K.Manickavachagom Pillay and T.Natarajan, S.Viswanathan Pvt.Ltd, (2015). Unit I: Chapter 4 (Sec 1,2,6 – 10)[1] Unit II: Chapter 6 (Sec 6 & 9)[1] Unit III: Chapter 2 (Sec 1 – 9)[2] Unit IV: Chapter 3 (Sec 1– 4,7 &8)[2] Unit V: Chapter 4 (Sec 1 – 8)[2]
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Course Outcomes:

Students will be able to

CO1: Identify the concepts of vector differentiation

CO2: Apply Gauss Divergence theorem and Stokes theorem

CO3: Understand the concepts of analytical geometry, the properties and applications of Planes.

CO4: Apply the properties of lines, co-planer lines, skew lines and their applications.

CO5: Analyze the equations of sphere and passing through the circle, tangent plane.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	2	2	1	2	3	2	2
CO2	2	3	2	1	2	3	3	2	2
CO3	1	2	3	2	3	2	3	2	3
CO4	2	3	2	1	2	3	3	2	2
CO5	1	2	2	3	2	2	3	2	2

Question Paper Pattern

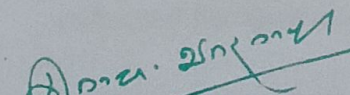
Maximum Marks: 75

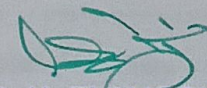
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

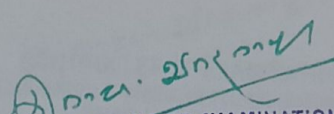
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

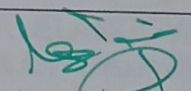

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 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-III INTEGRAL CALCULUS, FOURIER SERIES AND LAPLACE TRANSFORMS (FOR PHYSICS AND CHEMISTRY MAJOR)					
Paper Number		ALLIED 3					
Category	Allied	Year	I	Credits	3	Course Code	B2AMA3
		Semester	II				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		4	-		-		4
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		- To provide the mathematical foundation to understand and apply the principles of integration, Fourier series and Laplace transforms. - To develop the necessary skills to solve problems and understand scientific concepts.					
Course outline		Unit-I Integration- Definite integrals: Properties of definite integrals-problems- Integration by parts - problems.					
		Unit-II Reduction formula for $I_n = \int x^n e^{ax} dx$, $I_n = \int x^n \sin ax dx$, $I_n = \int x^n \cos ax dx$, $I_n = \int \sin^n x dx$, $I_n = \int \cos^n x dx$, $I_n = \int \sin^m x \cos^n x dx$ [simple problems only]					
		Unit-III Fourier Series: Definition – Fourier Series expansion of periodic functions with period 2π - Odd and even functions in Fourier series.					
		Unit-IV Laplace Transform – Definition - $L(e^{at})$, $L(\cos(at))$, $L(\sin(at))$, $L(t^n)$, where n is a positive integer, Basic theorems in Laplace Transforms (formula only) – $L[e^{\pm st} \cos bt]$, $L[e^{\pm st} \sin bt]$, $L[e^{\pm st} f(t)]$ - $L[f(t)]$, $L[f'(t)]$, $L[f''(t)]$.					
		Unit -V Inverse Laplace Transforms-Problems-Solution of Ordinary Differential Equations using Laplace Transforms.					


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 THANJAVUR-613 005.


Dr.K. ELANGO VAN
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Recommended Text	1. Calculus (Volume II), S. Narayanan and T.K. Manickavachagom Pillay, S. Viswanathan Pvt. Ltd, (2016).
	2. Calculus (Volume III), S. Narayanan and T.K. Manickavachagom Pillay, S. Viswanathan, Pvt. Ltd, (2014).
	UNIT –I : Chapter-1 (sec 11, 12) [1]
	UNIT –II : Chapter-1 (13.1 – 13.5) [1]
	UNIT –III : Chapter 6 (Sec 1-3) [2]
	UNIT –IV : Chapter 5 (Sec 1,2, 4,5) [2]
	UNIT –V : Chapter 5 (Sec 6,7,8) [2]

Course Outcomes:

Students will be able to

CO1: analyse definite integrals

CO2: describe reduction formula

CO3: illustrate the concepts of Fourier series

CO4: illustrate the concepts of Laplace Transformations.

CO5: determine the concepts of Inverse Laplace Transformations.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	2	2	1	2	3	2	2
CO2	2	3	2	1	2	3	3	2	2
CO3	1	2	3	2	3	2	3	2	3
CO4	2	3	2	1	2	3	3	2	2
CO5	1	2	2	3	2	2	3	2	2

Question Paper Pattern

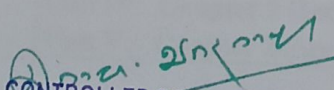
Maximum Marks: 75

Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

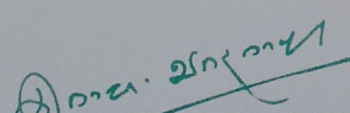
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

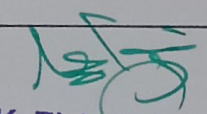

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Dr.K. ELANGO
 Head & Associate Professor
 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-I DIFFERENTIAL CALCULUS AND MATRICES (FOR STATISTICS MAJOR)					
Paper Number		ALLIED 1					
Category	Allied	Year	I	Credits	3	Course Code	B1AMAST1
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	-	-		4	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		- To provide the mathematical foundation to understand and apply the principles of differential calculus. - To train a complete treatment of matrices concept sand techniques necessary for a firm understanding of the proofs. - To make ability to apply the results to related problems.					
Course outline		Unit-I Successive differentiation – Leibnitz’s theorem (Proof excluded) and its applications.					
		Unit-II Curvature–Radius of Curvature in Cartesian Co-ordinates – Centre of Curvature.					
		Unit-III Matrices–Singular matrices–Inverse of matrix using adjoint matrix–Solution of simultaneous equations – Rank of matrix.					
		Unit –IV Matrices: Symmetric, skew–Symmetric matrices – Hermitian and skew–Hermitian matrices – Unitary Matrices–Orthogonal matrices–Problems.					
		Unit –V Matrices:Eigen values and Eigen vectors – Cayley – Hamilton theorem (Proof excluded) –Verification of Cayley-Hamilton theorem.					
Recommended Text		1. Calculus (Volume I), S. Narayanan and T.K. Manickavachagom Pillay, S.Viswanathan,PVT., LTD(2013). 2. Algebra (Volume II), T. K. Manickavachagom Pillay, T.Natarajan and K.S.Ganapathy, S.Viswanathan, Pvt.Ltd, (2015) Unit I: Chapter 3 (Sec. 1.1– 1.6, 2.1 -2.2) [1] Unit II: Chapter 10 (Sec. 2.1, 2.3, 2.4) [1] Unit III: Chapter 2 (Sec 1-5, 7,8,10,11) [2] Unit IV: Chapter 2 (Sec. 6.1 – 6.3, 9.1) [2] Unit V: Chapter 2 (Sec.16, 16.3) [2]					


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Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
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Course Outcomes:

Students will be able to

CO1: understand the derivatives of successive differentiation, Leibnitz theorem and their applications.

CO2: compute the equation for centre and radius of curvature by using Cartesian coordinates

CO3: recall the basic concepts of matrices.

CO4: understand the symmetric, skew symmetric Hermitian, Skew-Hermitian, Unitary and Orthogonal matrices.

CO5: determine the Eigen values, Eigen vectors and solve the Cayley-Hamilton theorem based problems.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	2	3	2	1	2	3	3	2	2
CO2	1	2	3	2	3	2	3	2	3
CO3	1	2	2	3	2	2	3	2	2
CO4	3	2	2	2	1	2	3	2	2
CO5	2	2	3	1	2	3	3	2	2

Question Paper Pattern

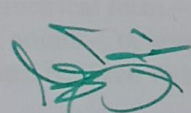
Maximum Marks: 75

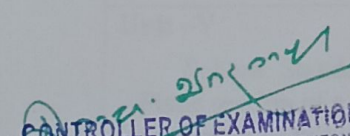
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either/or type—One question from each unit)

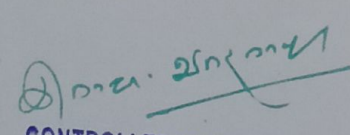
Part C: $3 \times 10 = 30$ (Three out of Five—One question from each unit)

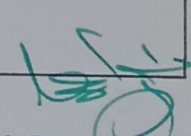

Dr.K. ELANGO VAN
Head & Associate Professor
Department of Mathematics
Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005


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THANJAVUR-613 005.

(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-II INTEGRAL CALCULUS AND ANALYTICAL GEOMETRY (FOR STATISTICS MAJOR)					
Paper Number		ALLIED 2					
Category	Allied	Year	I	Credits	3	Course Code	B2AMAST2
		Semester	I & II				
Instructional Hours per week		Lecture	Tutorial		Lab Practice		Total
		6	-		-		6
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		- To teach the concepts of Integral calculus and Analytical geometry of three dimensions for a firm understanding of the subjects. - To make ability to apply it in scientific concepts					
Course outline		Unit-I Definite integrals: Properties – problems – Integration by parts – problems – Reduction formula for $I_n = \int x^n e^{ax} dx$, $I_n = \int x^n \sin ax dx$ $I_n = \int x^n \cos ax dx$ $I_n = \int \sin^n x dx$ $I_n = \int \cos^n x dx$ [simple problems only]					
		Unit-II Multiple integrals: Double integrals – Evaluation of double integrals– simple problems (Change the order of integration excluded) – Triple integrals–simple problems.					
		Unit-III Plane: Standard equation of the plane – Intercept form – Normal form – Plane passing through the given points – Angle between the planes – Plane through the line of intersection of two planes					
		Unit –IV Straight line: Equation of a straight line in symmetrical form – Equation of a straight line passing through two given points – Coplanar lines – Equation of the Coplanar lines – Shortest distance between two skew lines – Equation of shortest distance					
		Unit –V Sphere: Standard equation – Length of the tangent from any point – Plane section of a sphere - Sphere passing through a given circle – Intersection of two spheres – Equation of the tangent plane to the sphere.					
Recommended Text		1. Calculus (Volume II), S. Narayanan and T. K. Manickavachagom Pillay, S. Viswanathan Pvt. Ltd, (2017). 2. Analytical Geometry (Three Dimensions), T. K. Manickavachagom Pillay and T. Natarajan, S. Viswanathan Pvt. Ltd, (2015).					


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 Dr. K. ELANGO
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 Rajah Serfoji Govt. College (Autonomous)
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	Unit I: Chapter 1(Sec.11, 12 & 13.1 – 13.4)[1] Unit II: Chapter 5 (Sec. 1, 2.1, 2.2, 4) [1] Unit III: Chapter 2: (Sec. 1 – 9)[2] Unit IV: Chapter 3 (Sec. 1– 4, 7 &8)[2] Unit V: Chapter 4 (Sec. 1 – 8)[2]
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Course Outcomes:

Students will be able to

CO1: understand the concepts of Definite Integrals and its Properties

CO2: analyze the concepts of Double and Triple Integrals

CO3: understand the concepts of analytical geometry, the properties and applications of planes.

CO4: apply the properties of lines, co-planer lines, skew lines and their applications

CO5: analyze the equations of sphere and passing through the circle, tangent plane.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	2	2	1	2	3	2	2
CO2	2	3	2	1	2	3	3	2	2
CO3	1	2	3	2	3	2	3	2	3
CO4	2	3	2	1	2	3	3	2	2
CO5	1	2	2	3	2	2	3	2	2

Question Paper Pattern

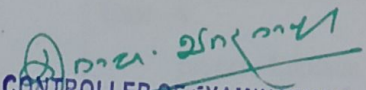
Maximum Marks: 75

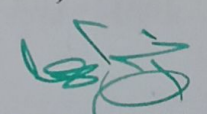
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type–One questions from each unit)

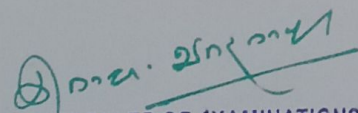
Part C: $3 \times 10 = 30$ (Three out of Five–One questions from each unit)

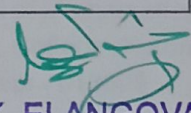

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Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-III VECTOR ANALYSIS AND LAPLACE TRANSFORMS (FOR STATISTICS MAJOR)					
Paper Number		ALLIED 3					
Category	Allied	Year	I	Credits	3	Course Code	B2AMAST3
		Semester	II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	-	-		4	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		• To provide a needful treatment of Vector differentiation and Vector integration and its applications. • To train the concepts of Laplace transformations for a firm understanding of the concepts • To make ability to apply the results in the related problems					
Course outline		Unit-I Scalars and Vectors – Derivative of a vector – Derivative of higher order integration of vectors – Velocity and acceleration Unit-II Vector differentiation: - Differentiation of vectors- A few results on differentiation of vectors- Gradient of a vector -Directional derivative- divergence and curl of a vector- Solenoidal and Irrotational vector. Unit-III Gauss Divergence Theorem– Stoke's Theorem – Simple problems- Verification of the above theorems (Proof excluded). Unit -IV Laplace Transform – Definition - $L(e^{at})$, $L(\cos(at))$, $L(\sin(at))$, $L(t^n)$, where n is a positive integer, Basic theorems in Laplace Transforms (formula only) – $L[e^{\pm st}\cos bt]$, $L[e^{\pm st}\sin bt]$, $L[e^{\pm st}f(t)]$ - $L[f(t)]$, $L[f'(t)]$, $L[f''(t)]$. Unit -V Inverse Laplace Transforms-Problems–Solution of Ordinary Differential Equations using Laplace Transforms.					


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 Department of Mathematics
 Rajah Serfoji Govt. College (Autonomous)
 Thanjavur - 613005

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Recommended Text	1. Allied Mathematics I, A. Singaravelu, A.R. Publications (2002)
	2. Vector Algebra and Analysis, T.K.Manickavachagom Pillay and T. Natarajan, Ananda Book Depot (2022)
	3. Calculus (Volume III), S.Narayanan and T. K.Manickavachagom Pillay, S.Viswanathan, Pvt.Ltd, (2019).
	UNIT I: Chapter 5 (P.No. 5.1 - 5.15)[1]
	UNIT II: Chapter 4 (Sec 1, 2, 6 - 10)[2]
	UNIT III: Chapter 6 (Sec 6, 9)[2]
	UNIT IV: Chapter 5 (Sec 1, 2, 4, 5)[3]
	UNIT V: Chapter 5 (Sec 6, 7, 8)[3]

Course Outcomes:

Students will be able to

CO1: understand the problems based on derivative of vectors.

CO2: explain the problems based on vector differentiation.

CO3: determine the solutions of Gauss Divergence and Stoke's Theorem.

CO4: explain and solve the concepts of Laplace Transforms.

CO5: explain and solve the problems of Inverse Laplace Transforms

Mapping of Cos with POs and PSOs

PO	Pos						PSOs		
	1	2	3	4	5	6	1	2	3
CO									
CO1	3	2	2	2	1	2	3	2	2
CO2	2	3	2	1	2	3	3	2	2
CO3	1	2	3	2	3	2	3	2	3
CO4	2	3	2	1	2	3	3	2	2
CO5	1	2	2	3	2	2	3	2	2

Question Paper Pattern

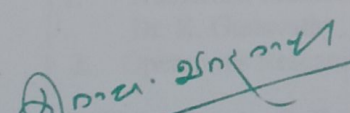
Maximum Marks: 75

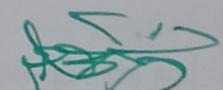
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)


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(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-I NUMERICAL METHODS AND OPERATIONS RESEARCH (ALLIED PAPER FOR COMPUTER SCIENCE MAJOR)					
Paper Number		ALLIED 1					
Category	Allied	Year	I	Credits	3	Course Code	B1AMACS1
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	-	-		4	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To obtain approximate solutions of Mathematical problems using numerical methods, Finite difference problems and the solution of linear systems. 2. To generate ideas of operations research such as linear programming problems and transportation problems.					
Course outline		Unit-I Solutions of algebraic and transcendental equation: Bisection Method – Iteration Method-Method of False position-Newton -Raphson Method.[simple problems only] Unit-II Finite differences: Forward differences - Backward differences – Newton’s Formulae for Interpolation (Problems Only) - Interpolation with Unequal intervals: Lagrange’s interpolation Formula. [Excluded inverse interpolation] Unit-III Solution of simultaneous linear algebraic equations: Direct Method: Gaussian elimination Method - Iterative methods: Gauss Seidal Methods. Numerical solutions of Ordinary differential equations: Taylor’s series method-Euler’s method (only). Unit -IV Linear programming: Formulation of linear programming problems-Graphical method- Assignment Problems: Introduction – Hungarian Algorithm – problems -Travelling salesman problem. Unit -V Transportation Problems: Introduction –Finding initial Basic feasible solution (North West Corner Rule, Least Cost Method, Vogel’s Approximation Method).					
Recommended Text		1. Numerical Methods, Dr. P. Kanthasamy, Dr. K.Thilagavathy and Dr. K. Gunavathy, S.Chand & company Pvt. Ltd (2016) 2. Operations Research, S. Kalavathy, Vikas Publishing Pvt.Ltd.(2024) UNIT I: Chapter 3 (Sec. 3.1 - 3.4)[1] UNIT II: Chapter 5 (Sec.5.1, 5.2) Chapter-6 (Sec. 6.2, 6.3) [1] Chapter 8 (Sec. 8.7) [1] UNIT III: Chapter 4 (Sec. 4.2, 4.9) & Chapter 11(Sec. 11.5, 11.9)[1] UNIT IV: Chapter 2 (Sec. 2.1 - 2.2) , Chapter 3 (Sec 3.1) [2]					

(For students admitted from 2026-2027)

	& Chapter 9 (Sec 9.3, 9.4, 9.6.1)[2] UNIT V : Chapter-8 (Sec 8.1-8.4)[2]
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Course Outcomes:

Students will be able to

CO1: understand the solutions of algebraic and transcendental equations.

CO2: analyze the detailed solutions of Finite differences.

CO3: recall Gaussian elimination method and apply Iterative methods and Numerical Solutions of ordinary Differential equation.

CO4: analyze Mathematical Formulation of Linear Programming Problems and Assignment Problems

CO5: apply the concepts of Transportation Problems.

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	2	3	2	1	2	3	3	2	2
CO2	1	2	2	3	2	2	3	2	2
CO3	2	2	3	2	2	2	3	2	3
CO4	1	2	2	3	2	2	3	2	2
CO5	1	2	3	2	3	2	3	2	3

Question Paper Pattern

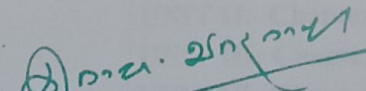
Maximum Marks: 75

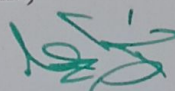
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

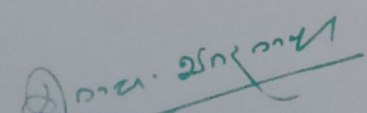
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

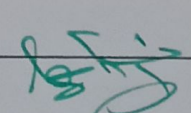

CONTROLLER OF EXAMINATIONS
RAJAH SERFOJI GOVERNMENT COLLEGE (AUTONOMOUS)
THANJAVUR-613 005.


Dr.K. ELANGO VAN
Head & Associate Professor
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Rajah Serfoji Govt. College (Autonomous)
Thanjavur - 613005

(For students admitted from 2026-2027)

Title of the Course		ALLIED PAPER-II PROBABILITY AND STATISTICS (FOR COMPUTER SCIENCE MAJOR)					
Paper Number		ALLIED 2					
Category	Allied	Year	I	Credits	3	Course Code	B2AMACS2
		Semester	I & II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		6		-		6	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		- To teach a thorough basic ideas of probability and statistics for a good understanding of subjects. - To make ability to the direct application of the theorems and results.					
Course outline		Unit-I Probability - Definition- Sample space – Independent Events – Addition theorem – Conditional Probability – Multiplication theorem- Baye's theorem-Simple problems.					
		Unit-II Random Variables-Distribution functions-Probability Mass Function-Probability density function-Two dimensional random variables-Simple problems.					
		Unit-III Mathematical Expectation-Simple problems-Moment generating functions –Simple problems.					
		Unit -IV Binomial Distribution-Moments-Moment generating function-Poisson distribution – Moments – Moment generating function – Normal Distribution – Moment generating function.					
		Unit -V Correlation and Regression- Properties – Rank correlation – Regression Lines –Properties- Simple problems.					
Recommended Text		Fundamentals of Mathematics Statistics, S.C.Gupta and V.K.Kapoor, Sultan Chand, Eleventh Edition (2019). UNIT I: Chapter 3 (Sec. 3.8 – 3.13) UNIT II: Chapter 5 (Sec. 5.1-5.5) UNIT III: Chapter 6 (Sec. 6.1 – 6.6) & Chapter-7 (Sec 7.1) UNIT IV: Chapter 8 (Sec. 8.4, 8.4.1, 8.4.6, 8.5, 8.5.2, 8.5.5) & Chapter-9 (Sec. 9.2, 9.2.5) UNIT V: Chapter 10 (Sec. 10.4 & 10.7) & Chapter 11(Sec. 11.2, 11.2.1 - 11.2.3)					


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Course Outcomes:

Students will be able to

CO1: recall the Fundamental Properties of Probability Theory

CO2: explain discrete and continuous random variables

CO3: apply the properties and problems of mathematical expectations

CO4: illustrate different probability distributions

CO5: analyze the properties and problems of Correlation and Regression

Mapping of Cos with POs and PSOs:

PO	Pos						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	2	2	1	2	3	2	2
CO2	2	3	2	1	2	3	3	2	2
CO3	1	2	3	2	3	2	3	2	3
CO4	2	3	2	1	2	3	3	2	2
CO5	1	2	2	3	2	2	3	2	2

Question Paper Pattern

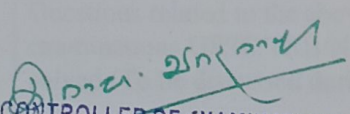
Maximum Marks: 75

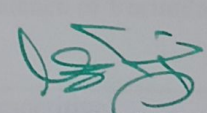
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

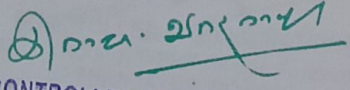
Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)

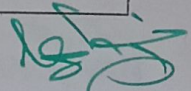

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Title of the Course		ALLIED PAPER III DISCRETE MATHEMATICS (FOR COMPUTER SCIENCE MAJOR)					
Paper Number		ALLIED 3					
Category	Allied	Year	I	Credits	3	Course Code	B2AMACS3
		Semester	II				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		4	-	-		4	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To study various finite (discrete) structures of Mathematics. 2. To study Set theory, Operations on sets and relations. 3. To introduce group codes, procedure for generating group codes. 4. To study connectives, truth tables and tautology.					
Course outline		Unit –I Set theory: Introduction-Sets-Notation and description of sets-Subsets-Venn-Euler diagram-Operations on sets.					
		Unit –II Relations: Cartesian products of two sets- Relations-Representation of relation-Operations on relations(Theorems excluded)					
		Unit–III Coding theory: Introduction- Hamming distance-Encoding a message-Group codes.					
		Unit –IV Connectives – Atomic and Compound statements – Well formed (Statement) formulae – Truth table of a Formula.					
		Unit –V Tautology -Tautological Implications and Equivalence of Formulae- Replacement Process.					
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)		Questions related to the above topics, from various competitive examinations UPSC/TRB/NET/UGC–CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)					


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Skills acquired from the course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Text	M.K.Venkataraman, Dr.N.Sridharan and N.Chandrasekharan, Discrete thematics, National Publishing Company, Chennai, 2000. UNIT I: Chapter 1 (P.No. 1.1 - 1.14) UNIT II: Chapter 2 (P.No. 2.1-2.19) UNIT III: Chapter 8 (P.No. 8.1- 8.6) UNIT IV: Chapter 9 (P.No. 9.4 -9.16 & 9.21 - 9.25) UNIT V: Chapter 9 (P.No. 9.25 - 9.39)
Reference Books	1. J.P. Trembly and R.Manohar, Discrete Mathematical Structures with Applications to Computer Science, TMH Edition 1997. 2. A.R. Vasistha, A.K.Vasistha, M.AKrishnaprakasam media (P)Ltd., 2008. 3. Kenneth H. Rosen, Discrete mathematics and its applications, 7 th edition, Tata MC Grow Hill Publication. co, Ltd., New Delhi, Special Indian edition 2011.

Course Outcomes:

Students will be able to

- CO1: Understand the concepts of set theory
CO2: Understand the techniques of coding and decoding systems.
CO3: Able to get logical ideas to solve Tautology and Equivalence formulae.
CO4: Gain the knowledge of connectives and truth table.
CO5: Able to get logical ideas to solve Tautology, Equivalence formulae.

Mapping of Cos with POs and PSOs:

PO	POs						PSOs		
CO	1	2	3	4	5	6	1	2	3
CO1	3	2	3	2	1	1	3	3	2
CO2	3	2	3	2	1	1	3	3	2
CO3	3	2	3	2	1	1	3	3	2
CO4	3	2	3	2	1	1	3	3	2
CO5	3	2	3	2	1	1	3	3	2

Question Paper Pattern

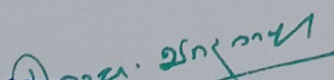
Maximum Marks: 75

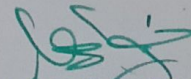
Examination Duration: 3Hours

Part A: $10 \times 2 = 20$ (Two questions from each unit)

Part B: $5 \times 5 = 25$ (Either / Or type—One questions from each unit)

Part C: $3 \times 10 = 30$ (Three out of Five—One questions from each unit)


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