YADAVA COLLEGE

(Autonomous)

Govindarajan Campus, Thiruppalai

Madurai - 625 014

DEPARTMENT OF MATHEMATICS

B.Sc(Reg & S/F)., Degree course in Mathematics

CBCS (2018 – 2019)

Course Profile

Final Copy of syllabus incorporating all suggestions made in the meeting of Board of studies held on **09.04.2018**

DEPARTMENT OF MATHEMATICS
UNDERGRADUATE PROGRAMME
COURSE CONTENT
Choice Based Credit System(w.e.f. 2018 – 2019)

Sem	Part		Title of the Subject	Teaching Hour/ Week	Credits	Evaluation		Exam hours
						Internal	External	
I	Part I		Tamil	5	3	25	75	3
	Part II		English	5	3	25	75	3
	Part III	Core	Analytical Geometry 3D & Vector Calculus	6	3	25	75	3
			Calculus & Trigonometry	5	3	25	75	3
		Allied	Physics I	5	5	25	75	3
	Part IV	ENS	Environmental Science	2	2	25	75	3
		SBE	Communicative English I	2	2	25	75	3
	Part V	NSS/NCC /PE	-	-	-	-	-	-
II	Part I		Tamil	5	3	25	75	3
	Part II		English	5	3	25	75	3
	Part III	Core	Classical Algebra	6	3	25	75	3
			Differential Equations	5	3	25	75	3
		Allied	Physics II	5	5	25	75	3
	Part IV	VAE	Value Education	2	2	25	75	3
		SBE	Communicative English II	2	2	25	75	3
	Part V	NSS/NCC /PE	-	-	-	-	-	-

Sem	Part		Title of the Subject	Teach. Hour/ Week	Credits	Evaluation		Exam hours
						Internal	External	
III	Part I		Tamil	5	3	25	75	3
	Part II		English	5	3	25	75	3
	Part III	Core	Modern Algebra	6	4	25	75	3
		Elective I	Quantitative Aptitude	5	4	25	75	3
		Allied	Physics III	5	5	25	75	3
	Part IV	NME	Mathematics for Competitive Exam I	2	2	25	75	3
		SBE	Communicative English I	2	2	25	75	3
	Part V	NSS/NCC /PE	-	-	-	-	-	-
IV	Part I		Tamil	5	3	25	75	3
	Part II		English	5	3	25	75	3
	Part III	Core	Real Analysis	6	4	25	75	3
		Elective II	Programming in C (or) Ms-Office	3	3	25	75	3
			Practical I- Programming in C	2	2	40	60	3
		Allied	Physics IV	5	5	25	75	3
	Part IV	NME	Mathematics for Competitive Exam II	2	2	25	75	3
		SBE	Communicative English II	2	2	25	75	3
	Part V	NSS/NCC /PE	-	-	-	-	-	-

Sem	Part		Title of the Subject	Teach. Hour/ Week	Credits	Evaluation		Exam hours
						Internal	External	
V	Part I		Nil	-	-	-	-	-
	Part II		Nil	-	-	-	-	-
	Part III	Core	Operation Research	6	5	25	75	3
			Complex Analysis	6	5	25	75	3
			Statistics I	5	3	25	75	3
			Mechanics	6	5	25	75	3
		Elective III	Programming in C++ (or) RDBMS	3	3	25	75	3
			Practical II – Programming in C++	2	2	40	60	3
	Part IV	SBE	Soft Skills I	2	2	25	75	3
	Part V	NSS/NCC/ PE	-	-	-	-	-	-
VI	Part I		Nil	-	-	-	-	-
	Part II		Nil	-	-	-	-	-
	Part III	Core	Linear Algebra	6	5	25	75	3
			Graph Theory	6	5	25	75	3
			Statistics II	6	5	25	75	3
			Numerical Analysis	5	3	25	75	3
			Oracle (or) Java	3	2	25	75	3
			Practical III - Oracle	2	2	40	60	3
	Part IV	SBE	Soft Skills II	2	2	25	75	3
	Part V	NSS/NCC/ PE	-	-	-	-	-	-

DEPARTMENT MATHEMATICS

UNDERGRADUATE PROGRAMME
(w.e.f. 2018 – 2019)
Teaching hours and Credit

Subject			Semester								
			I	II	III	IV	V	VI	Total papers	Total	
										Hr	Cr
Part I		Hr	5	5	5	5	-	-	4	20	-
		Cr	3	3	3	3	-	-		-	12
Part II		Hr	5	5	5	5	-	-	4	20	-
		Cr	3	3	3	3	-	-		-	12
Part III	Core	Hr	11	11	6	6	23	28	15	85	-
		Cr	6	6	4	4	18	22		-	60
	Allied	Hr	5	5	5	5	-	-	4	20	-
		Cr	5	5	5	5	-	-		-	20
	Elective	Hr	-	-	5	5	5	-	3	15	-
		Cr	-	-	5	5	5	-		-	15
Part IV	ENS	Hr	2	-	-	-	-	-	1	2	-
		Cr	2	-	-	-	-	-		-	2
	VAE	Hr	-	2	-	-	-	-	1	2	-
		Cr	-	2	-	-	-	-		-	2
	SBE	Hr	2	2	2	2	2	2	6	12	-
		Cr	2	2	2	2	2	2		-	12
	NME	Hr	-	-	2	2	-	-	4	4	-
		Cr	-	-	2	2	-	-		-	4
Part V	NSS/ NCC/P E	Hr	-	-	-	-	-	-	-	-	-
		Cr	-	-	-	-	-	1	-	-	1
Total		Hr	30	30	30	30	30	30	-	180	-
		Cr	21	21	24	24	25	25	-	-	140

QUANTITATIVE APTITUDE

Semester : III **Subject Code :**

Hours per Week : 5 **Credits : 5**

Objective :

- Attain numerical aptitude skills
- Attain reasoning aptitude skills
- Appear in any competitive examinations skills as civil service , TNPSC exams and entrance examinations such as MAT , CAT , SAT , XLRI exams.

Unit I

Numbers – H.C.F and L.C.M of Numbers – Simplication.

Unit II

Average – Problems on Numbers – Problems on Ages**.**

Unit III

Percenage - Ratio and Proportion – Time and Work.

Unit IV

Pipes and Cistern - Time and Distance – Problems on Trains.

Unit V

Simple Interest – Compound Interest – Permutations & Combinations.

Text Book:

Quantitative Aptitude by Dr.R.S.Aggarwal, Seventh Edition, ISBN: 81-219-2498-7.

Reference Book:

Quantitative Aptitude by Abhijit Guha

MECHANICS

Semester :V **Subject Code :**
Hours per Week: 6 **Credits : 5**

Objective :

To enable the students

- to learn the various concept in statics and Dynamics
- to understand parallelogram law of forces like and unlike parallel forces, friction and to study about the projectiles, central orbits
- to attain skills to participate in mathematical competition and competitive examinations

Unit I

Forces acting at a point – Parallelogram law of forces - Triangle law of forces – Lami's theorem – Resolution of forces – Theorems on resolved parts – Resultant of any number of coplanar forces – Condition of Equilibrium.(Chapter 2 Fully)

Unit II

Forces acting on a rigid body parallel forces (like & unlike – Moment of a force – Varigon's Theorem. (Chapter 3 Fully)

Unit III

Projectiles – Path of a Projectile is a Parabola – Range etc – Range of a particle in an inclined plane etc.(Chapter 6 – 6.1 to 6.16)

Unit IV

Collision of elastic bodies – Introduction – Fundamental laws of Impact – Impact of a smooth sphere on a fixed smooth plane – Direct Impact of two smooth spheres – Loss of Kinetic energy due to direct impact of two smooth spheres – Oblique impact of two smooth spheres – Loss of kinetic energy due to oblique impact of two smooth spheres – Dissipation of energy due to impact. (Chapter 8 – 8.1 to 8.9)

Unit V

Central orbits – Components of velocity and Acceleration along and perpendicular to the radius vector – Differential equation of a central orbit – Pedal equation.

(Chapter 11 – 11.1 to 11.11)

TEXT BOOKS :

Statics : M.K.Venkatraman - Agasthiar Publication

Dynamics :M.K.Venkatraman - Agasthiar Publication

REFERENCE BOOK :

Mechanics : P.Durai Pandian ,Laxmi Durai Pandian , Muthamizh Jayaprakash – S.Chand & Company Ltd -2006 ISBN 81-219-0272 - X

NUMERICAL ANALYSIS

Semester :VI **Subject Code:**

Hours per Week: 5 **Credits : 3**

Objective:

- This course is to help the students to understand the systematic manner the most important principles, methods and process used for obtaining numerical results
- To enable the students to attain skills to participates in mathematical competition and competitive examination

Unit I

Numerical Solution of Algebraic and Transcendental Equation – Iteration Method-Newton – Raphson Method – Method of False Position - Solution of Simultaneous Linear Equation – Gauss Iteration Method-Gauss Seidel Method (Chapter 1 - 1.1 , 1.2, 1.4 to 1.6, chapter 2-2.1 to 2.7)

Unit II

Finite Differences-Forward Differences - Backward Differences - Operators - Relation-Properties - Finding Missing Terms - Inverse Operators- Factorial Notation (Chapter 3 - 3.1, 3.2)

Unit III

Interpolation - Newton's Forward and Backward Formula - Divided Differences and their properties - Newton's Divided Difference Formula - Gauss's Formula – Stirling's Formula – Lagrange's Formula - Simple problems. (Chapter 4 - 4.1 to 4.5)

Unit IV

Numerical differentiation – Finding the first and second order derivatives Maximum and Minimum value of a function for the given data. (Chapter 5- 5.1 to 5.4)

Unit V

Numerical integration – Newton's - Cote's formula – Trapezoidal rule - Simpson's one-third rule - Simpson's three eight rule – Weddley's rule. (Chapter 6 - 6.1 to 6.6)

TEXT BOOK:

Numerical Analysis : S.Arumugam , A.Somasundaram, A.Thangapandi Issac , New Gamma Publishing House.

REFERENCE BOOK:

Numerical Method :

P.Kandasamy, K.Thilagavathy, K.Gunavathy - S.Chand & sons company – Newdelhi

Numerical Analysis :

S.Narayanan & T.K.Manickavasagampillai – S.Viswanathan publishing company.

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Department of Mathematics

M.Sc., Degree course in Mathematics

CBCS (2018 – 2019)

Course Profile

Final Copy of syllabus incorporating all suggestions made in the meeting of Board of studies held on **09.04.2018**

DEPARTMENT OF MATHEMATICS
POSTGRADUATE PROGRAMME

(w.e.f. 2018 –2019)

COURSE CONTENT

Choice Based Credit System

Semester	Title of the Papers	Teaching hour per week
I	Algebra I	6
	Real Analysis I	6
	Differential Equation	6
	Mechanics	6
	Elective I (From List I)	6
II	Algebra II	6
	Topology	6
	Real Analysis II	6
	Graph Theory	6
	Elective II (From List II)	6
III	Algebra III	6
	Statistics	6
	Complex Analysis	6
	Fuzzy Mathematics	6
	Elective – III (From List III)	6
IV	Measure Theory	6
	Functional Analysis	6
	Number Theory	6
	Calculus of Variations and Linear Integral Equations	6
	Elective –IV (From List IV)	6

DEPARTMENT OF MATHEMATICS

POSTGRADUATE PROGRAMME

(w.e.f. 2018 –2019)

COURSE CONTENT

Choice Based Credit System

Sem	Title of Papers	Teaching hours/ week	Credits	Evaluation		Duration of Exam
				Internal	External	
I	Algebra I	6	4	25	75	3
	Real Analysis I	6	5	25	75	3
	Differential Equation	6	4	25	75	3
	Mechanics	6	4	25	75	3
	Elective I (From List I)	6	5	25	75	3
II	Algebra II	6	5	25	75	3
	Topology	6	4	25	75	3
	Real Analysis II	6	4	25	75	3
	Graph Theory	6	4	25	75	3
	Elective II (From List II)	6	5	25	75	3

III	Algebra III	6	5	25	75	3
	Statistics	6	4	25	75	3
	Complex Analysis	6	4	25	75	3
	Fuzzy Mathematics	6	4	25	75	3
	Elective III (From List III)	6	5	25	75	3
IV	Measure Theory	6	4	25	75	3
	Functional Analysis	6	5	25	75	3
	Number Theory	6	4	25	75	3
	Calculus of Variations and Linear Integral Equations	6	5	25	75	3
	Elective IV (From List IV)	6	5	25	75	3

List I	**Major Electives**
	Differential Geometry
	Automata Theory & Formal Languages
	Modern Applied Algebra
List II	**Major Electives**
	Operation Research
	Combinatorial Mathematics
	Visual Basic with Practical
List III	**Major Electives**
	Numerical Analysis with C program
	Bio Statistics
	Business Statistics
List IV	**Major Electives**
	Stochastic Process
	Econometrics
	Number Theory & Cryptography

GRAPH THEORY

Semester : II **Subject Code:**

Contact hours per week:6 **Credit : 4**

Objectives:

To enable the students to

- understand the fundamental concepts and theorems in Graph theory
- Develop their knowledge in the current areas of Graph theory and to create research culture among the students in subject.
- increase their ability to perform well in UGC / CSIR examinations

UNIT I

Incidence matrix – Submatrices of A(G) – Circuit Matrix – Cut-set matrix – Path matrix – Adjacency matrix. (Section 7.1 to 7.9)

UNIT II

Directed graph –what is a directed graph-some types of diagraph-diagraph and binary relations-directed paths—and connectedness- Euler diagraphs- trees with directed edges-fundamental circuits in diagraph-Adjacency matrix of a diagraph. (section 9.1 to 9.9)

UNIT III

Types of enumeration- counting labeled trees-counting unlabelled trees-polya's counting theorem-Graph enumeration using poly's theorem .(section 10.1 -10.5)

UNIT IV

Contact Network, Analysis of contact Network, Synthesis of contact network, Sequential switching network, Unit cube and its graph.(Section 12.1 to 12.5).

UNIT V

Transport networks

Extension of Max-flow Mincut theorem-Minimal cost flows-The multi-commodity flow.(section14.1 -14.4)

TEXT BOOK :

Graph theory : Narsingh Deo. ISBN 81-203-0145-5. First Indian reprint 1995.

REFERENCE BOOKS:

1. Application of Graph Theory : Dr M. Murugan , Muthali Publications, Chennai.
2.Introduction to Graph theory : Douglas B- west 2^{nd} edition, Prentice Hall of India, New Delhi.

Number Theory

Subject Code : **Semester : IV**

Hours per Week : 6 **Credits :4**

Objectives:

To enable the students to

- To make the students understand the basic concepts to become familiar with the techniques to have some variety and depth in Number theory.
- To introduce the basic concepts of arithmetical functions and average of arithmetical functions.
- To have an extensive study of the properties of arithmetical functions.
- To appreciate the results on congruence, quadratic residues and to solve problems.

Unit I

The fundamental Theorem of Arithmetic : Introduction – Divisibility – Greatest common divisor – Prime number – The fundamental theorem of arithmetic – The series of reciprocals of the primes –The Euclidean Algorithm. Arithmetical functions and Dirichlet multiplication: Introduction – The Mobus function – The Euler totient function – A relation Connecting φ and μ. (chapter 1-section 1.1 to 1.8, chapter 2- section 2.1 to 2.4)

Unit II

A product formula for $\varphi(n)$. The Dirichlet product of arithmetical functions – Dirichlet inverses and the Mobius inversion formula – The mangoldt function – Multiplicative functions - Averages of Arithmetical functions: Introduction – The big oh notayion – Eular's summation formula (chapter 2 – section 2.5 to 2.9 , chapter 3-section 3.1 to 3.3)

Unit III

Some elementary asymptotic formulas – The average order of d(n) – The average order of $\varphi(n)$. Some elementary theorems on the distribution of prime numbers : Introduction – Chebyshev's functions $\psi(x)$ and $\vartheta(x)$.

(chapter 3 – section 3.4 to 3.8 , chapter 4-section 4.1 to 4.4)

Unit IV

Congruencies :Definition and basic property of congruences – Linear congruences – Reduced residue systems and the Eular Fermet theorem – Polynomial congruence modulo p – Lagrange's theorem – Applications of lagrange's theorem – Polynomial congruences with prime power modli. (chapter 5-section 5.1 to 5.10)

Unit V

Quadric residues and the quadratic reciprocity law : Quadratic residues – Legendre's symbol and its properties – Evaluation of (-1/p) and (2/p) – Gauss'lemma –The quadratic reciprocity law – Application of reciprocity law. (chapter 9-section 9.1 to 9.6)

Text Book:

Torm M.Apostol , Introduction to Analytic Number theory , (chapter 1 – 5 , Narosa Publishing House , New Delhi , 1998

Reference Books:

1.David M.Burton , Elementry Number Theory , Universal Book Stall , New Delhi

2.Z.I.Borerich , I.R.Shafarerich , Number Theory , Academic press , Inc

3.Kumaravelu , Susheela Kumaravelu , Elements of Number theory , Raja sarka offset Printers , Siakasi , 2002.

DEPARTMENT OF MATHEMATICS

Yadava College , Madurai – 14

B.Sc., Mathematics(R & S/F) – 2018 - 2019

Semester	Title of the Subject	Status
I	Analytical Geometry 3D & Vector Calculus	No change
	Calculus & Trigonometry	No change
II	Classical Algebra	No change
	Differential Equations	No change
III	Modern Algebra	No change
	Quantitative Aptitude	**Change**
	Mathematics for Competitive Exam I	No change
	Ancillary Mathematics I	No change
IV	Real Analysis	No change
	Programming in C (or) M.S.Office	**Change**
	Mathematics for Competitive Exam II	No change
	Ancillary Mathematics II	No change
V	Operation Research	No change
	Complex Analysis	No change
	Statistics I	No change
	Mechanics	**Change**
	Programming in C++ (or) RDBMS	**Change**
	Ancillary Mathematics III	No change
VI	Linear Algebra	No change
	Java (or) Oracle	**Change**
	Graph Theory	No change
	Statistics II	No Change
	Numerical Analysis	**Change**
	Ancillary Mathematics IV	No change

DEPARTMENT OF MATHEMATICS

Yadava College , Madurai – 14

M.Sc., Mathematics(S/F) – 2018 - 2019

Semester	Title of the Subject	Status
I	Algebra I	No change
	Real Analysis I	No change
	Differential Equation	No change
	Mechanics	No change
	Elective I (From List I)	No change
II	Algebra II	No change
	Real Analysis II	No change
	Topology	No change
	Graph Theory	**Change**
	Elective II (From List II)	No change
III	Algebra III	No change
	Statistics	**Change**
	Complex Analysis	No change
	Fuzzy Mathematics	No change
	Elective III (From List III)	No change
IV	Measure Theory	No change
	Functional Analysis	No change
	Number Theory	**Change**
	Calculus of Variations and Linear Integral Equations	No change
	Elective – IV (From List IV)	No change