Undergraduate Programme in Mathematics

(With effect from the Academic Year 2020-21)

FEBRUARY 2020

Note: The Board of Studies has designed Learning Outcomes Based Curriculum Framework of B.Sc. Mathematics Programme prescribed by UGC

1. COURSE STRUCTURE

FIRST SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -I	4	3	25	75	100
Part - II	English Paper -I	4	3	25	75	100
Part - III	Algebra	5	4	25	75	100
	Differential Calculus	4	4	25	75	100
	Allied Paper- I	9	5	25	75	100
Part - IV	Basic Tamil/Adv. Tamil/NME –I*	2	2	25	75	100
	Soft Skills -I	2	3	50	50	100

SECOND SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -II	5	3	25	75	100
Part - II	English Paper -II	5	3	25	75	100
Part - III	Trigonometry	4	4	25	75	100
	Integral Calculus and Vector Analysis	5	4	25	75	100
	Allied Paper- II	9	5	25	75	100
Part - IV	Basic Tamil/Adv. Tamil/NME-II*	1	2	25	75	100
	Soft Skills -II	1	3	50	50	100

***NME:WILL HAVE TO CHOOSE ANY ONE OF THE PAPER FROM THE OTHER DEPARTMENT**

THIRD SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext. Marks	Total
Part - I	Language Paper -III	5	3	25	75	100
Part - II	English Paper -III	5	3	25	75	100
Part - III	Analytical Geometry	5	4	25	75	100
	Differential Equations	4	4	25	75	100
	Allied Paper- III	9	5	25	75	100
Part - IV	Environmental Studies	1	Examination will be held in the IV Sem.			
	Soft Skills -III	1	3	50	50	100

FOURTH SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -IV	5	3	25	75	100
Part - II	English Paper -IV	5	3	25	75	100
Part - III	Transform Techniques	4	4	25	75	100
	Statics	5	4	25	75	100
	Allied Paper- IV	9	5	25	75	100
Part - IV	Environmental Studies	1	2	25	75	100
	Soft Skills -IV	1	3	50	50	100

FIFTH SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - III	Algebraic Structures-I	6	4	25	75	100
	Real Analysis-I	6	4	25	75	100
	Dynamics	6	4	25	75	100
	Discrete Mathematics	6	4	25	75	100
	Elective Paper -I: Choose any one from Group-A	6	5	25	75	100
Part - IV	Value Education		2	25	75	100

SIXTH SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - III	Algebraic Structures-II	6	4	25	75	100
	Real Analysis-II	6	4	25	75	100
	Complex Analysis	6	4	25	75	100
	Elective Paper -II: Choose any one from Group-B	6	5	25	75	100
	Elective Paper -III: Choose any one from Group-B	6	5	25	75	100
Part - V	Extension Activity		1			

LIST OF ALLIED SUBJECTS:

Allied Physics – I (Theory)
Allied Chemistry – I (Theory)
Calculus of finite differences and Numerical Analysis –I
Mathematical Statistics – I
Financial Accounting - I
Allied Physics – II (Theory) (pre-requisite Physics – I).
Allied Physics I & II (Practical)
Allied Chemistry – II (Theory) (pre-requisite Chemistry – I)
Allied Chemistry – I & II (Practical)
Calculus of finite differences and Numerical Analysis -II (pre-requisite Calculus of finite differences and Numerical Analysis -I)
Mathematical Statistics II - (pre requisite Mathematical Statistics- I)
Financial Accounting - II (prerequisite Financial Accounting - I)
Cost Accounting
Management Accounting.

LIST OF ELECTIVE SUBJECTS

GROUP – A

PROGRAMMING LANGUAGE 'C' WITH PRACTICALS
PROGRAMMING LANGUAGE PYTHON WITH PRACTICALS
MATHEMATICAL MODELING
NUMERICAL METHODS

GROUP - B

ELEMENTARY NUMBER THEORY
GRAPH THEORY
OPERATIONS RESEARCH
SPECIAL FUNCTIONS
APPLIED STATISTICS

The following distribution of marks for Computer related subjects which have both theory and practical (syllabus combined both theory and practical in each paper together) in B.Sc. Mathematics be followed:

PAPER	INTERNAL	EXTERNAL	TOTAL
Theory	25	75	100
Practical	40	60	100

Finally, theory marks (100) be reduced to 60% and practical marks (100) be reduced to 40%.

***

UNIVERSITY OF MADRAS

B.Sc. DEGREE COURSE IN MATHEMATICS

SYLLABUS WITH EFFECT FROM 2020-2021

Inst.Hrs : 5 **YEAR: I**

Credits : 4 **SEMESTER: I**

CORE-I: ALGEBRA

UNIT I

Theory of Equations :Polynomial equations with Imaginary and irrational roots- Relation between roots and coefficients- Symmetric functions of roots in terms of coefficients.
Chapter 6 : Section 9 to 12.

UNIT II

Reciprocal equations - Standard form-Increase or Decrease the roots of the given equation - Removal of terms Approximate solutions of roots of polynomials by Horner's method.
Chapter 6: section 16, 16.1, 16.2, 17, 30.

UNIT III

Summation of Series : Binomial- Exponential -Logarithmic series (Theorems without proof):
Chapter 3: Section 10, Chapter 4: Section 3, 3.1, 3.5, 3.6, 3.7 (omit 3.4)

UNIT IV

Symmetric- Skew Symmetric- Hermitian- Skew Hermitian- Orthogonal Matrices- Eigen values & Eigen Vectors- Similar matrices- Cayley - Hamilton Theorem.
Chapter 2: Section 6.1 to 6.3, 9.1, 9.2, 16, 16.1, 16.2, 16.3.

UNIT V

Prime number and Composite number - Divisors of a given number N- Euler's function (without proof) - Integral part of a real number - congruences.
Chapter 5: Section 1 to 13.

Contents and treatment as in

1. Algebra, Volume I by T. K. ManicavachagamPillay,T.Natarajan, K.S.Ganapathy, Viswanathan Publication 2007 - Unit – 1 and 2.
2. Algebra, Volume II by T. K. ManicavachagomPillay ,T.Natarajan ,K.S.Ganapathy, Viswanathan Publication 2008 - Unit – 3, 4 and 5.

Reference:-

1. Algebra by S. Arumugam (New Gama publishing house, Palayamkottai).
2. Algebra and Trigonometry, Volume I and II by P.R.Vittal, V.Malini (Margham Publishers).

e-Resources:

1. http://mathworld.wolfram.com
2. http://www.themathpage.com/

CORE-II: DIFFERENTIAL CALCULUS

Inst.Hrs : 4 **YEAR: I**
Credits : 4 **SEMESTER: I**

UNIT I

Successive differentiation - n^{th} derivative- standard results – Trigonometrical transformation – formation of equations using derivatives - Leibnitz's theorem and its applications

Chapter 3 section 1.1 to 1.6, 2.1 and 2.2

UNIT II

Total differential of a function – special cases – implicit functions - partial derivatives of a function of two functions - Maxima and Minima of functions of two variables- Lagrange's method of undetermined multipliers.

Chapter 8 : Section 1.3 to 1.5 and 1.7, Section 4, 4.1 and 5.

UNIT III

Envelopes – method of finding envelopes – Curvature- circle, radius and centre of curvature- Cartesian formula for radius of curvature – coordinates of the centre of curvature – evolute-and involute - radius of curvature and centre of curvature in polar coordinates – p-r equation

Chapter 10 Section 1.1 to 1.4 and Section 2.1 to 2.7

UNIT IV

Polar coordinates - angle between the radius vector and the tangent – slope of the tangent in the polar coordinates – the angle of intersection of two curves in polar coordinates- polar sub tangent and polar sub normal – the length of arc in polar coordinates.

Chapter 9 Section 4.1 to 4.6

UNIT V

Definition-Asymptotes parallel to the axes – special cases – another method for finding asymptotes - asymptotes by inspection – intersection of a curve with an asymptote.

Chapter 11 - Section 1 to 7.

Content and treatment as in

"Calculus", Volume - 1 by S. Narayanan and T.K. Manicavachagompillay - S.Viswanathan publishers – 2006

Reference:-

1. Calculus , Dr. P.R. Vittal&Dr. V. Malini, Margham Publications, Chennai.
2. Calculus by Thomas and Fenny, Pearson Publication.
3. Calculus by Stewart
4. Calculus , Dr. P.R. Vittal&Dr. V. Malini, Margham Publications, Chennai.

e-Resources:

1. http://www.themathpage.com/
2. http://mathworld.wolfram.com
3. http://www.univie.ac.at/future.media/moe/galerie.html
4. http://www.analyzemath.com/calculus

CORE-III: TRIGONOMETRY

Inst.Hrs : 4 **YEAR: I**
Credits : 4 **SEMESTER: II**

UNIT I

Expansions of powers of $\sin\theta$, $\cos\theta$ - Expansions of $\cos^n\theta$, $\sin^n\theta$,$\cos^m\theta\sin^n\theta$
Chapter 2, Section 2.1, 2.1.1, 2.1.2,2.1.3

UNIT II

Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\tan(\theta_1+\theta_2+ \ldots\ldots +\theta_n)$ - Expansions of sin x, Cosx, tanx in terms of x-Sum of roots of trigonometric equations – Formation of equation with trigonometric roots. Chapter 3, Section 3.1 to 3.6

UNIT III

Hyperbolic functions-Relation between circular and hyperbolic functions - Formulas in hyperbolic functions – Inverse hyperbolic functions Chapter 4, Section 4.1 to 4.7 .

UNIT IV

Inverse function of exponential functions – Values of Log (u+iv) - Complex index.
Chapter 5, Section 5.1 to 5.3

UNIT V

Sums of Trigonometric series – Applications of binomial, exponential, , logarithmic and Gregory's series - Difference method. Chapter 6, Section 6.1 to 6.6.3

Content and treatment as in

Trigonometry by P. Duraipandian and KayalalPachaiyappa, Muhil Publishers.

Reference:-

1. Trigonometry, Calculus , Dr. P.R. Vittal , Margham Publications, Chennai.
2. Trigonometry by T.K. Manickavachagam Pillay.S.Viswanathan (Printers and Publishers) Pvt.Ltd.

e-Resources:

1. http://mathworld.wolfram.com
2. http://ocw.mit.edu/courses/mathematics/

CORE-IV: INTEGRAL CALCULUS AND VECTOR ANALYSIS

Inst.Hrs : 5
Credits : 4

YEAR: I
SEMESTER: II

UNIT I

Reduction formulae– Types $\int x^n e^{ax} dx, \int x^n cosaxdx, \int x^n sinaxdx, \int cos^n xdx, \int sin^n xdx, \int sin^m xcos^n xdx, \int tan^n xdx, \int cot^n xdx, \int sec^n xdx, \int cosec^n xdx, \int x^n (logx)^m dx$

Bernoulli's formula.

Chapter 1 Section 13, 13.1 to 13.10,14,15.1.

UNIT II

Multiple Integrals- definition of the double integrals- evaluation of the double integrals- double integrals in polar coordinates – triple integrals – applications of multiple integrals – volumes of solids of revolution – areas of curved surfaces – change of variables – Jacobians.

Chapter 5 Section 1, 2.1, 2.2, 3.1, 4, 6.1, 6.2, 6.3, 7
Chapter 6 Section 1.1, 1.2, 2.1 to 2.4.

UNIT III

Beta and Gamma functions - infinite integral – definitions – recurrence formula of Γ functions - properties of β-functions - relation between β and Γ functions.

Chapter 7 Sections 1.1 to 1.4 , 2.1, 2.3, 3, 4, 5.

UNIT IV

Introduction - directional derivative- Gradient- divergence- curl- Laplacian Differential Operator.

Chapter 2 Sections 2.1 - 2.13.

UNIT V

Line, surface and volume integrals - Integral Theorems - Gauss, Greens and Stokes (Without proof) – Problems.

Chapter 3 Sections 3.1 to 3.6 and Chapter 4 Sections 4.1 to 4.5.

Content and treatment as in

1. "Calculus", Vol- II by S. Narayanan and T.K. Manicavachagampillay - S. Viswanathanpublishers– 2007 for Unit 1 , Unit 2 , Unit 3.
2. "Vector Analysis" by P.Duraipandian and KayalalPachaiyappa, S.ChandFor Unit 4, Unit 5.

Reference:-

1. Integral Calculus and differential equations : Dipak Chatterjee (TATA McGraw Hill Publishing companyLtd.).
2. Vector Algebra and Analysis by Narayanan and T.K.Manickvachagam Pillay S .Viswanathan Publishers.
3. Vector Analysis: Murray Spiegel (Schaum Publishing Company, NewYork).

e-Resources:

1. http://mathworld.wolfram.com.
2. http://www.sosmath.com.

CORE-V: ANALYTICAL GEOMETRY

Inst.Hrs : 5 **YEAR: II**
Credits : 4 **SEMESTER: III**

UNIT I

Chord of contact – polar and pole,- conjugate points and conjugate lines – chord with (x_1, y_1) as its midpoint – diameters – conjugate diameters of an ellipse.- semi diameters- conjugate diameters of hyperbola

Chapter 7: Sections 7.1 to 7.3 , Chapter – 8 Section 8.1 to 8.5.

UNIT II

Polar coordinates: General polar equation of straight line – Polar equation of a circle on A_1A_2 as diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola.

Chapter 10 : Sec 10.1 to 10.8.

UNIT III

Introduction – System of Planes - Length of the perpendicular – Orthogonal projection.

Chapter 2 Sec 2.1 to 2.10.

UNIT IV

Representation of line – angle between a line and a plane- co-planar lines- shortest distance 2 skew lines- Length of the perpendicular- intersection of three planes

Chapter 3 :Sec 3.1 to 3.8.

UNIT V

Equation of a sphere - general equation - section of a sphere by a plane - equation of the circle - tangent plane - angle of intersection of two spheres- condition for the orthogonality - radical plane.

Chapter 6 : Sec 6.1 to 6.8.

Contents and treatment as in

1. Analytical Geometry of 2D by P.Durai Pandian- Muhil publishers for Unit – 1 and 2
2. Analytical Solid Geometry of 3D by Shanthi Narayan and Dr.P.K. Mittal-S.Chand& Co. Pvt.Ltd.- for Unit – 3 to 5

Reference :

1. Analytical Geometry of Two Dimension by T. K. Manikavachakam Pillai and S. Narayanan.S.Viswanathan (Printers and Publishers) Pvt. Ltd.
2. Analytical Geometry of Three Dimension by T. K. Manikavachakam Pillai and S. Narayanan.S.Viswanathan (Printers and Publishers) Pvt. Ltd.

e-Resources:

1. http://mathworld.wolfram.com.
2. http://www.univie.ac.at/future.media/moe/galerie.html

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

CORE-VI: DIFFERENTIAL EQUATIONS

Inst.Hrs : 4 **YEAR: II**
Credits : 4 **SEMESTER: III**

UNIT I

Ordinary Differential Equations:Variable separable-Homogeneous Equation-Non-Homogeneous Equations of first degree in x and y-Linear Equation-Bernoulli's Equation-Exact differential equations.

Chapter 2: Section 1 to 6.

UNIT II

Equation of first order but not of higher degree: Equation solvable for dy/dx- Equation solvable for y-Equation solvable for x- Clairauts form-Linear Equations with constant coefficients-Particular integrals e^{ax}, sinax, cosax, x^m, Ve^{ax} where V is sinax or cosax or x^m .

Chapter 4: Section 1, 2.1, 2.2, 3.1.

Chapter 5: Section 4.

UNIT III

Simultaneous linear differential equations- Linear Equations of the Second Order -Complete solution in terms of a known integrals- Reduction to the Normal form- Change of the Independent Variable - Method of Variation of Parameters.

Chapter 6: Section- 6

Chapter 8:Section- 1,2,3,4.

UNIT IV

Partial differential equation: Formation of PDE by Eliminating arbitrary constants and arbitrary functions-complete integral-singular integral-General integral- Lagrange's Linear Equations Pp+Qq=R.

Chapter 12: Section- 1, 2, 3.1, 3.2, 4.

UNIT V

Special methods - Standard forms - Charpit's Methods - Related problems

Chapter 12: Section-5.1, 5.2, 5.3, 5.4, 6.

Contents and treatment as in

"Differential Equations and its applications", by S.Narayanan, T.K.Manikavachagam Pillay –- S.Viswanathan (Printers and Publishers) Pvt. Ltd(2006).

Reference:

1. Mathematics for B.Sc-Branch-I Volume –III by P.Kandasamy ,K.Thilagavathy S.Chand Publications.
2. Differential equations with applications and historical notes by George F.Simmons, 2nd Ed,TataMcgraw Hill Publications .
3. Differential Equations by ShepleyL.Ross, 3 rdEd ,JohnWiely and sons 1984.
4 .Differential Equations by N.P.Bali,Laxmi Publications Ltd,New Delhi-2004.
5. Ordinary and Partial differential Equation by Dr.M.D.Raisinghania ,S.Chand.

e-Resources:

1. http://mathworld.wolfram.com
2. http://www.analyzemath.com/calculus/Differential_Equations/applications. html

UNIVERSITY OF MADRAS

B.Sc. DEGREE COURSE IN MATHEMATICS

SYLLABUS WITH EFFECT FROM 2020-2021

CORE-VII: TRANSFORM TECHNIQUES

Inst.Hrs : 4 **YEAR: II**
Credits : 4 **SEMESTER: IV**

UNIT I: The Laplace Transforms-Definitions-Sufficient conditions for the existence of the Laplace transform(without proof)-Laplace transform of periodic functions-some general theorems-evaluation of integrals using Laplace transform-Problems.

Chapter 5: Section-1 to 5.

UNIT II:The inverse Laplace Transforms- Applications of Laplace Transforms to ordinary differential equations with constant co-efficients and variable co-efficients, simultaneous equations and equations involving integrals-Problems.

Chapter 5: Section-6 to 12.

UNIT III: Fourier series- Expansion of periodic functions of period 2π- Expansion of even and odd functions, Half range Fourier series-Change of intervals –Problems.

Chapter 6: Section-1 to 6.

UNIT IV: Fourier Transform- Infinite Fourier Transform(Complex form) – Properties of Fourier Transform – Fourier cosine and Fourier sine Tranform – Properties – Parseval's identity – Convolution theorem - Problems.

Chapter 6: Section-8 to 15.

UNIT V: Z Transforms: Definitionof Z-Transform and its properties - Z-Transforms of some basic functions- Examples and simple problems

Chapter 7: Sections -7.1 to 7.3.

Contents and treatment as in

1. "Calculus-Volume III" – S.Narayananand T.K.ManicavachagamPillai. (Ananda Book Depot)(**for Units I to IV**)
2. "Engineering Mathematics for Semester III- Third Edition – T.Veerarajan (Tata McGraw-Hill Publishing Company Ltd, New Delhi) **(for Unit-V**)

Reference Books

1. Engineering Mathematics Volume III – P.Kandasamy and others (S.Chand and Co.)
2. Advanced Engineering Mathematics- Stanley Grossman and William R.Devit.

Engineering Mathematics III-A.Singaravelu, Meenakshi Agency, Chenani, 2008

e-Resources:

1. http://mathworld.wolfram.com.
2. http://www.sosmath.com.

CORE-VIII: STATICS

Inst.Hrs : 5 **YEAR: II**
Credits : 4 **SEMESTER: IV**

UNIT I

Force- Newtons laws of motion - resultant of two forces on a particle- Equilibrium of a particle
Chapter 2 - Section 2 .1 , 2.2 , Chapter 3 - Section 3.1.

UNIT II

Forces on a rigid body – moment of a force – general motion of a rigid body- equivalent systems of forces – parallel forces – forces along the sides of a triangle – couples
Chapter 4 - Section 4 .1 to 4.6.

UNIT III

Resultant of several coplanar forces- equation of the line of action of the resultant- Equilibrium of a rigid body under three coplanar forces – Reduction of coplanar forces into a force and a couple.-problems involving frictional forces
Chapter 4 - Section 4.7 to 4.9,
Chapter 5 - Section 5.1, 5.2.

UNIT IV

Centre of mass – finding mass centre – a hanging body in equilibrium
Chapter 6 - Section 6.1 to 6.3.

UNIT V

Hanging strings- equilibrium of a uniform homogeneous string – suspension bridge
Chapter 9 - Section 9.1, 9.2.

Contents and treatment as in

"Mechanics" by P. Duraipandian ,LaxmiDuraipandian , MuthamizhJayapragasham, S. Chand and Co limited 2008 .

Reference:

1. Dynamics – K. ViswanathaNaik and M. S. Kasi, Emerald Publishers.
2. Dynamics – A. V. Dharmapadam, S. Viswanathan Publishers.
3. Mechanics – Walter Grenier.

e-Resources:

1. https://www.wikipedia.org/
2. https://physics.info

CORE-IX: ALGEBRAIC STRUCTURES-I

Inst.Hrs : 6 **YEAR: III**
Credits : 4 **SEMESTER: V**

UNIT I
Introduction to groups- Subgroups- cyclic groups and properties of cyclic groups- Lagrange's Theorem- A counting principle.
Chapter 2 Section 2.4 and 2.5.

UNIT II
Normal subgroups and Quotient group- Homomorphism- Automorphism.
Chapter 2 Section 2.6 to 2.8.

UNIT III
Cayley's Theorem- Permutation groups.
Chapter 2 Section 2.9 and 2.10.

UNIT IV
Definition and examples of ring- Some special classes of rings- homomorphism of rings- Ideals and quotient rings- More ideals and quotient rings.
Chapter 3 Section 3.1 to 3.5.

UNIT V
The field of quotients of an integral domain- Euclidean Rings- The particular Euclidean ring.
Section 3.6to 3.8.

Contents and treatment as in
"Topics in Algebra" – I. N. Herstein, Wiley Eastern Ltd.

Reference:
1. Modern Algebra by M.L.Santiago, McGraw Hill Education India pvt Ltd.
2. Modern Algebra by S. Arumugam and others, New Gamma publishing House, Palayamkottai.
3. Modern Algebra by Visvanathan Nayak, Emerald Publishers, Reprint 1992.

e-Resources:
1. https://nptel.ac.in
2. http://garsia.math.yorku.ca/~sdenton/algstruct.

CORE-X: REAL ANALYSIS-I

Inst.Hrs : 6 **YEAR: III**
Credits : 4 **SEMESTER: V**

UNIT I

Sets and Functions:Sets and elements- Operations on sets- functions- real valued functions- equivalence- countability - real numbers- least upper bounds.

Chapter 1 Section 1. 1 to 1.7

UNIT II

Sequences of Real Numbers:Definition of a sequence and subsequence- limit of a sequence- convergent sequences- divergent sequences- bounded sequences- monotone sequences-

Chapter 2 Section 2.1 to 2.6

UNIT III

Operations on convergent sequences- operations on divergent sequences- limit superior and limit inferior- Cauchy sequences.

Chapter 2 Section 2.7 to 2.10

UNIT IV

Series of Real Numbers: Convergence and divergence- series with non-negative terms- alternating series- conditional convergence and absolute convergence- tests for absolute convergence- series whose terms form a non-increasing sequence- the class l^2

Chapter 3 Section 3.1 to 3.4, 3.6, 3.7 and 3.10

UNIT V

Limits and Metric Spaces:Limit of a function on a real line-. Metric spaces - Limits in metric spaces.

Continuous Functions on Metric Spaces: Function continuous at a point on the real line- Reformulation- Function continuous on a metric space.

Chapter 4 Section 4.1 to 4.3 Chapter 5 Section 5.1-5.3

Contents and Treatment as in

"Methods of Real Analysis" : Richard R. Goldberg (Oxford and IBH Publishing Co.).

Reference:

1. Principles of Mathematical Analysis by Walter Rudin,TataMcGrawHill.
2. Mathematical Analysis Tom M Apostol, Narosa Publishing House.

e-Resources:

1. https://mathcs.org/analysis/reals/numseq/sequence.html.
2. http://www-groups.mcs.st-andrews.ac.uk/~john/analysis/index.html
3. http://www.phengkimving.com.

CORE-XI: DYNAMICS

Inst.Hrs : 6 **YEAR: III**
Credits : 4 **SEMESTER: V**

UNIT I
Kinematics -Basic units – velocity – acceleration- coplanar motion.
Chapter 1 - Section 1.1 to 1.4.

UNIT II Work, Energy and power – work – conservative field of force – power – Rectilinear motion under varying Force: Simple harmonic motion (S.H.M.) – S.H.M. along a horizontal line- S.H.M. along a vertical line
Chapter 11 - Section 11.1to 11.3, Chapter 12 - Section 12.1 to 12.3

UNIT III
Projectiles -Forces on a projectile- projectile projected on an inclined plane.
Impact: Impulsive force - impact of sphere - impact of two smooth spheres – impact of a smooth sphere on a plane – oblique impact of two smooth spheres
Chapter 13 - Section 13.1,13.2, Chapter 14 - Section 14.1, 14.5

UNIT IV
Circular motion – Conical pendulum – simple pendulum – central orbits -general orbits - central orbits- conic as centered orbit.
Chapter 15 - Section 15.1, 15.2, 15.6
Chapter 16 - Section 16.1 to 16.3

UNIT V
Moment of inertia, Perpendicular and parallel axes theorem.
Chapter 17 -Section 17.1, 17.1.1

Contents and treatment as in
"Mechanics" – P. Duraipandian, LaxmiDuraipandian ,MuthamizhJayapragasham, S. Chand and Co limited 2008 .

Reference :

1. Dynamics – K. ViswanathaNaik and M. S. Kasi, Emerald Publishers.
2. Dynamics – A. V. Dharmapadam, S. Viswanathan Publishers.
3. Mechanics – Walter Grenier

e-Resources:

1. https://nptel.ac.in
2. https://www.wikipedia.org

CORE-XII: DISCRETE MATHEMATICS

Inst.Hrs : 6 **YEAR: III**
Credits : 4 **SEMESTER: V**

UNIT I

Integers:Set, some basic properties of integers, Mathematical induction, divisibility of integers, representation of positive integers
Chapter 1 - Sections 1.1 to 1.5

UNIT II

Boolean algebra &Applications: Boolean algebra, two element Boolean algebra, Disjunctive normal form, Conjunctive normal form
Chapter 5 - Sections 5.1 to 5.4

UNIT III

Application, Simplication of circuits, Designing of switching circuits, Logical Gates and Combinatorial circuits.
Chapter 5 - Section 5.5, 5.6

UNIT IV

Recurrence relations and Generating functions: Sequence and recurrence relation, Solving recurrence relations by iteration method, Modeling of counting problems by recurrence relations, Linear (difference equations) recurrence relations with constant coefficients, Generating functions, Sum and product of two generating functions, Useful generating functions, Combinatorial problems.
Chapter 6 - Section 6.1 to 6.6

UNIT V

Proportional logic and Predicate logic: Proportional logic, Adequate system of connectivies, Translation of sentences in a Natural Language into Statement Formula, Logical validity of arguments, Predicate Logic, Negation of a statement obtained by qualification of a predicate, Logical operations on predicates or quantified predicates, Symbolization of sentences by using predicates, Quantifiers and connectives, Logical validity of arguments.
Chapter 8 - Sections 8.1, 8.5 to 8.8 (Omit Section 8.2 to 8.4)

Contents and treatment as in

"Introduction to Discrete Mathematics", 2nd edition, 2002 by M. K. Sen and B. C. Chakraborty, Books and Allied Private Ltd., Kolkata.

Reference:-

1. Discrete mathematics for computer scientists and mathematicians by J.L. Mertt,AbrahamKendel and T. P. Baker prentice-hall, India.
2. Discrete mathematics for computer scientists by John Truss-Addison Wesley.
3. Elements of Discrete Mathematics, C. L. Liu, New York Mcgraw-Hill, 1977.

e-Resources:

1. https://brilliant.org/wiki/discrete-mathematics/.
2. https://www.tutorialspoint.com/discrete_mathematics/.

CORE-XIII: ALGEBRAIC STRUCTURES-II

Inst.Hrs : 6 **YEAR: III**
Credits : 4 **SEMESTER: VI**

UNIT I
Vector spaces. Elementary basic concepts- linear independence and bases Chapter 4 Section 4.1 and 4.2.

UNIT II
Dual spaces
Chapter 4 Section 4.3.

UNIT III
Inner product spaces.
Chapter 4 Section 4.4.

UNIT IV
Algebra of linear transformations- characteristic roots.
Chapter 6 Section 6.1 and 6.2.

UNIT V
Matrices- canonical forms- triangular forms.
Chapter 6 Section 6.3 and 6.4.

Content and Treatment as in
"Topics in Algebra" – I. N. Herstein-Wiley Eastern Ltd.

Reference:

1. University Algebra – N. S. Gopalakrishnan – New Age International Publications, Wiley Eastern Ltd.
2. First course in Algebra – John B. Fraleigh, Addison Wesley.
3. Text Book of Algebra – R. Balakrishna and N. Ramabadran, Vikas publishing Co.
4. Algebra – S. Arumugam, New Gamma publishing house, Palayamkottai.

e-Resources:
1. https://nptel.ac.in.
2. http://ebooks.lpude.in.linearalgebra.

CORE-XIV: REAL ANALYSIS-II

Inst.Hrs : 6 **YEAR: III**
Credits : 4 **SEMESTER: VI**

UNIT I

Continuous Functions on Metric Spaces: Open sets- closed sets- Discontinuous function on R^1. Connectedness, Completeness and Compactness :More about open sets- Connected sets. Chapter 5 Section 5.4 to 5.6
Chapter 6 Section 6.1 and 6.2

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.
Chapter 6 Section 6.3 to 6.8

UNIT III

Calculus:Sets of measure zero, definition of the Riemann integral, existence of the Riemann integral- properties of Riemann integral.
Chapter 7 Section 7.1 to 7.4

UNIT IV

Derivatives- Rolle's theorem, Law of mean, Fundamental theorems of calculus.
Chapter 7 Section 7.5 to 7.8

UNIT V

Taylor's theorem- Pointwise convergence of sequences of functions, uniform convergence of sequences of functions.
Chapter 8 Section 8.5 Chapter 9 Section 9.1 and 9.2

Content and Treatment as in

"Methods of Real Analysis"- Richard R. Goldberg (Oxford and IBH Publishing Co)

Reference:-

1. Principles of Mathematical Analysis by Walter Rudin,TataMcGrawHill.
2. Mathematical Analysis Tom M Apostal,Narosa Publishing House.

e-Resources:

1. https://nptel.ac.in.
2. https://mathonline.wikidot.com.
3. https://en.wikipedia.org/wiki/Metric_space.

CORE-XV: COMPLEX ANALYSIS

Inst.Hrs : 6
Credits : 4

YEAR: III
SEMESTER: VI

UNIT I

Analytic Functions:Functions of a Complex Variable – Limit- Theorems on Limits – Continuuous functions- Differentiability – Cauchy – Riemann equations – Analytic functions-Harmonic functions – Conformal mapping.
Chapter 1 – sec 2.1 to 2.9.

UNIT II

Bilinear Transformations:Elementary transformations – Bilinear transformations – Cross ratio-Fixed Points of Bilinear Transformations – Mapping by Elementary Functions - The Mapping $w = z^2$, z^n, n is a positive integer,$w = e^z$, sin z, cos z.
Chapter 3 – sec 3.1 to 3.4 , Chapter 5 – sec 5.1 to 5.5

UNIT III

Complex Integration – definite integral – Cauchy's Theorem – Cauchy's integral formula – Higher derivatives. Chapter 6 – sec 6.1 to 6.4

UNIT IV

Series expansions – Taylor's series – Laurent's Series – Zeroes of analytic functions-Singularities. Chapter 7 – 7.1 to 7.4

UNIT V

Residues – Cauchy's Residue Theorem – Evaluation of definite integrals.
Chapter 8 – 8.1 to 8.3.

Content and treatment as in

"Complex Analysis" byDr.S.Arumugam,Thangapandi Isaac, Dr.A.Somasundaram, SciTech publications(India) Pvt Ltd,2002.

Reference:

1. Complex variables and Applications (Sixth Edition) by James Ward Brown and RuelV.Churchill, Mc.Grawhill Inc.
2. Complex Analysis by P.Duraipandian,KayalakPachaiyappa,S.Chand& Co Pvt.Ltd.
3. Complex Analysis ,T.K.Manickavachagom Pillay, S.Viswanathan Publishers Pvt. Ltd.

e-Resources:

1. http://ebooks.lpude.in.complexanalysis.
2. https://nptel.ac.in.

UNIVERSITYOFMADRAS

B.Sc. Degree Course in Mathematics

SYLLABUS WITH EFFECT FROM2020-2021

ALLIED:CALCULUSOFFINITEDIFFERENCES ANDNUMERICALANALYSIS-I

UNITI

Solutions of algebraic and transcendental equations: Bisection method- Iteration method- Regula-falsi method- Newton-Raphson method. - Chapter 1 :Section 1.1 - 1.4

UNITII

Solutions of Simultaneous Linear Equations: Gauss-Elimination method, Gauss-Jordan method, Crout's method, Gauss-Seidel method. - Chapter 2 :Section 2.1 - 2.4 , 2.6

UNITIII

Finite Differences: E operators and relation between them- Differences of a polynomial-Factorial polynomials- inverse operator Δ^{-1} -Summation Series. - Chapter 3 :Section 3.1 to 3.4, 3.6, 3.7.

UNITIV

Interpolation with Equal Intervals:Newton's Forward and Backward Interpolation formulae- Central Differences Formulae: Gauss-Forward and Backward Formulae- Stirling's Formula and Bessel's Formula-Equidistant terms with one or more missing values.
Chapter 4 :Section 4.1- 4.3 (omit 4.1a, 4.4), 4.7 . - Chapter 5 :Section 5.1- 5.6.

UNITV

Interpolation with Unequal Intervals: Divided Differences - Newton's Divided Differences Formula for Interpolation -Lagrange's Formula for Interpolation-Inverse Interpolation- Lagrange's method- Reversion of Series method. - Chapter 6 :Section 6.1, 6.2, 6.5, 6.7.

ContentandTreatmentasin

"Calculus of Finite Differences and Numerical Analysis" by P. Kandasamy and K. Thilagavathy, S. Chand and Co Pvt.Ltd.

Reference:

1. "Numerical Analysis " by B. D. Gupta, Konark Publishing.
2. "Numerical methods in Science and Engineering" by M. K. Venkataraman, National Publishing House, Chennai.

e-Resources:

1. https://nptel.ac.in
2. https://www.encyclopediaofmath.org/index.php/Finite-difference_calculus

B.Sc.DEGREECOURSEINMATHEMATICS
SYLLABUSWITHEFFECTFROM2020-2021

ALLIED:MATHEMATICAL STATISTICS–I

UNITI
Concept of sample space- Events- Definition of Probability (Classical,Statstical& Axiomatic)- Addition and Multiplication laws of Probability- Independence- Conditional Probability- Baye's theorem – Simple Problems.

UNITII
Random Variables (Discrete and Continuous) Distribution function- Expected values and Moments- Moment generating function – Probability generating function- Examples.

UNITIII
Characteristic function- Uniqueness and Inversion theorems (Statements and applications only)- Cumulants - Chebychev's Inequality – Simple Problems.

UNITIV
Concepts of bivariate distributions- Correlation and Regression- Linear Prediction- Rank Correlation coefficient-Concepts of partial and multiple correlation coefficients- Simple problems.

UNITV
Standard Distributions – Binomial- Poisson- Normal- Uniform distributions- Geometric- Exponential-Gamma -Beta distributions- Inter relationship between distributions.

Reference:

- S.C.Gupta&V.K.Kapoor : Elements of Mathematical Statistics, Sultan Chand & Sons, NewDelhi.
- Hogg R.V. & Craig A.T. (1988) : Introduction to Mathematical Statistics, McMillan.
- Mood A.M. &Graybill F.A. &Boes D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
- Snedecor G.W. & Cochran W.G(1967) : Statistical Methods, Oxford and IBH.

e-Resources:

1. https://nptel.ac.in
2. https://www.wikipedia.org.
3. http://ebooks.lpude.in.statistics.

B.Sc.DEGREECOURSEINMATHEMATICS
SYLLABUSWITHEFFECTFROM2020-2021

ALLIED:CALCULUS OF FINITE DIFFERENCES AND NUMERICALANALYSIS-II

UNITI
Numerical Differentiation: Derivatives using Newton's forward and backward difference formulae-Derivatives using Stirling's formula- Derivatives using divided difference formula-Maxima and Minima using the above formulae.
Chapter 7 :Section 7.1- 7.4, 7.6.

UNITII
Numerical Integration: General Quadrature formula- Trapezoidal rule-Simpson's one-third rule-Simpson's three-eighth rule- Weddle's rule- Euler-Maclaurin Summation formula-
Stirling's formula for n!. - Chapter 7 :Section 7.7- 7.9, 7.13- 7.15.

UNITIII
Difference equations:Linear homogenous and nonhomogenous difference equation with constant coefficients- particular integrals for $a^u x^m$, x^m ,sinkx, coskx
Chapter 8 :Section 8.1- 8.4, 8.6

UNITIV
Numerical solution of Ordinary Differential Equations (I order only):
Taylor's series method- Picard's method- Euler's method- Modified Euler's method.
Chapter 9: Section 9.5-9.7, 9.9.

UNITV
Numerical solution of Ordinary Differential Equations (I order only):
Runge-kuttamethod(fourth order only)- Predictor-Corrector method- Milne's method - Adams-Bashforth method.
Chapter 9 : Section 9.10 - 9.14.

ContentandTreatmentasin
"Calculus of Finite Differences and Numerical Analysis" by P. Kandasamy and K. Thilagavathy, S. Chand and Co. Pvt.Ltd.

Reference:

1) "Numerical Analysis " by B. D. Gupta, Konark Publishing.
2) "Numerical methods in Science and Engineering" by M. K. Venkataraman, National Publishing House, Chennai.

e-Resources:
1. https://nptel.ac.in
2. https://www.encyclopediaofmath.org/index.php/Finite-difference_calculus

B.Sc.DEGREE COURSE IN MATHEMATICS
SYLLABUSWITHEFFECTFROM2020-2021

ALLIED:MATHEMATICAL STATISTICS-II

UNITI
Sampling theory – Sampling Distributions – Concept of Standard error – Sampling distribution based on normal distribution- t, Chi Square and F distributions.

UNITII
Point estimation – Concepts of unbiasedness – consistency – efficiency and sufficiency- Cramer Rao inequality – Methods of estimation- Maximum likelihood- moments - minimum square and their properties (Statement only).

UNITIII
Test of significance – Standard error- Large sample test, Exact test based on normal, t, chi-square and F distribution with respect to population mean/means, proportion/proportions, variance and correlation coefficient. Test of independence of attributes based on contingency tables- Goodness of fit based on chi-square.

UNITIV
Analysis of Variance: One way, two way classification concepts &Problems.Interval estimation – Confidence intervals for population mean/means- Proportion/proportions and variances based on t, Chi-Square and F.

UNITV
Test of hypothesis- Type I and II errors- Power of test – Neymann Pearson lemma- Likelihood ratio test-concepts of most powerful test- statements and results only-simple problems.

Reference:

- S.C.Gupta&V.K.Kapoor: Elements of Mathematical Statistics, Sultan Chand & Sons, NewDelhi.
- Hogg R.V. & Craig A.T. (1988): Introduction to Mathematical Statistics, McMillan.
- Mood A.M. &Graybill F.A. &Boes D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
- Snedecor G.W. & Cochran W.G(1967) : Statistical Methods, Oxford and IBH.
- Hoel P.G. (1971) : Introduction to Mathematical Statistics, Wiley.
- Wilks S.S. Elementary Statistical Analysis, Oxford and IBH.

e-Resources:

1. https://nptel.ac.in
2. https://www.wikipedia.org.
3. http://ebooks.lpude.in.statistics.

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

ELECTIVE-I: PROGRAMMING IN 'C' WITH PRACTICALS

Inst.Hrs : 6 **YEAR: III**
Credits : 5 **SEMESTER: V**

THEORY

UNIT I

Introduction - Constants-Variables-Data-types -Operators, Precedence of operators – Managing Input and Output Operations .
Chapters : 2,3 and 4.

UNIT II

Decision making and branching: Simple if, if else, nested if, else if ladder and switch statement – conditional operator – go to statement.
Decision making and looping : while, do while and for statement – nested for loops – jumps in loops (continue and break statements).
Chapters : 5 and 6.

UNIT III

Arrays : One dimensional and 2 dimensional arrays – declarations – initialization of arrays.
Character Arrays and Strings: Declaration andIntialization of Strings - Reading and Writing strings - Operations on strings - String handling functions.
Chapters: 7 and 8

UNIT IV

Functions : Need for User defined functions- A Multi function Program- Elements of User defined functions - Function definition , Function Call and Function Declaration – Return Values and their types- Categories of functions – Nesting of Functions- Recursion .
Pointers: Understanding Pointers-Accessing address of a variable- Declaration and Intialization of Pointers- Accessing a Variable through its Pointer- Function call by reference - call by value.
Chapters : 9 and 11.

UNIT V

File Management in C : Definition-Opening and Closing a file- Input/ Output operations on Files- Error Handling during I/O operations.
Chapter 12.

B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

Content and Treatment as in
"Programming in ANSI C", 7th Edition, 2017, by E. Balagurusamy, McGraw Hill Education India Private Limited**.**

Reference:-
1. "Programming in C" by Venugopal.
2. "Programming with C" by Gottfied.B.S ,Schaum"s outline series, TMH 2001.
3. "Let us 'C'" by YashvantKanitkar ,BPB Publications.
4. "Programming with C" by R.S.Bichkar,Universities Press (INDIA) Pvt.Ltd.

e-Resources:
1.https://www.w3schools.in/c-tutorial.
2.https://en.cppreference.com/w/c.

PRACTICALS

Writing 'C' programs for the following:

1. To convert Centigrade to Fahrenheit
2. To find the area, circumference of a circle
3. To convert days into months and days
4. To solve a quadratic equation
5. To find sum of n numbers
6. To find the largest and smallest numbers
7. To generate Pascal's triangle, Floyd's triangle
8. To find the trace of a matrix
9. To add and subtract two matrices
10. To multiply two matrices
11. To generate Fibonacci series using functions
12. To compute factorial of a given number, using functions
13. To add complex numbers using functions
14. To concatenate two strings using string handling functions
15. To check whether the given string is a palindrome or not using string handling functions.

Question paper pattern: External (60)+ Internal(40)
Internal:
Internal Practical Assessment + Attendence + Record = 30 + 5 + 5 = 40 marks

External:
- Answer any 2 questions out of 3 questions : (2 **x 30 = 60)**

B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

ELECTIVE-II : GRAPH THEORY

Inst.Hrs : 6 **YEAR: III**
Credits : 5 **SEMESTER: VI**

UNIT I
Graphs and Subgraphs: Introduction- Definition and examples, degrees, sub graphs, isomorphism, independent sets and coverings, intersection graphs and line graphs, matrices, operations on graphs
Chapter 2 Sections 2.0 – 2.9 (Omit section 2.5)

UNIT II
Degree sequences and Connectedness:Degree sequences and graphic sequences – simple problems. Walks, trails, paths, connectedness and components, blocks, connectivity – simple problems.
Chapter 3 Sections 3.0 – 3.2 , Chapter 4 Sections 4.0 – 4.4

UNIT III
Eulerian and Hamiltonian graphs - Chapter 5 Sections 5.0 – 5.2

UNIT IV
Trees : Characterisation of Trees, Centre of a Tree -simple problems.
Planarity : Definition and properties, characterization of planar graphs.
Chapter 6 Sections 6.0 – 6.2 , Chapter 8 Sections 8.0 – 8.2

UNIT V
Directed Graphs: Definition and basic properties, paths and connections, digraphs and matrices, tournaments - Chapter 10 Sections 10.0 – 10.4

Content and treatment as in
"Invitation to Graph Theory", by S.Arumugam and S.Ramachandran, Scitech Publications (India) Pvt. Ltd., Chennai 17.

Reference:

1. A first look at graph theory by John Clark and Derek Allan Holton, Allied publishers.
2. Graph Theory by S.Kumaravelu and SusheelaKumaravelu,Publishers authors C/o 182 Chidambara Nagar, Nagarkoil.

e-Resources:
1. https://nptel.ac.in.
2. https://mathonline.wikidot.com.
3. http://ebooks.lpude.in.graphtheory.

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

ELECTIVE-III: OPERATIONS RESEARCH

Inst.Hrs : 6 **YEAR: III**
Credits : 5 **SEMESTER: VI**

UNIT I

Linear programming: Formulation – graphical solution. Simplex method. Big-M method. Duality-primal-dual relation.

Chapter 6 Sections 6.1 – 6.13, 6.20 – 6.31

UNIT II

Transportation problem: Mathematical Formulation. Basic Feasible solution. North West Corner rule, Least Cost Method, Vogel's approximation. Optimal Solution. Unbalanced Transportation Problems. Degeneracy in Transportation problems.

Assignment problem: Mathematical Formulation. Comparison with Transportation Model. Hungarian Method. Unbalanced Assignment problems

Chapter 9 Sections 9.1 – 9.12 ,Chapter 8 Sections 8.1 – 8.5

UNIT III

Sequencing problem: n jobs on 2 machines – n jobs on 3 machines – two jobs on m machines – n jobs on m machines.

Game theory : Two-person Zero-sum game with saddle point – without saddle point – dominance – solving 2 x n or m x 2 game by graphical method.

Chapter 10 Sections 10.1 – 10.6 ,Chapter 12 Sections 12.1 – 12.15

UNIT IV

Queuing theory: Basic concepts. Steady state analysis of M / M / 1 and M / M / S models with finite and infinite capacities.

Chapter 5 Sections 5.1 – 5.18

UNIT V

Network: : Project Network diagram – CPM and PERT computations. (Crashing excluded)
Chapter 13
Sections 13.1 – 13.10

Content and treatment as in

Operations Research, by R.K.Gupta , Krishna Prakashan India (p),Meerut Publications.

Reference:

1. Gauss S.I. Linear programming , McGraw-Hill Book Company.
2. Gupta P.K. and Hira D.S., Problems in Operations Research ,S.Chand& Co.
3. KantiSwaroop, Gupta P.K and Manmohan , Problems in Operations Research,Sultan Chand & Sons.
4. Ravindran A., Phillips D.T. and Solberg J.J., Operations Research, John wiley & Sons.
5. Taha H.A. Operation Research, Macmillan pub. Company, New York.
6. Linear Programming, Transporation, Assignment Game by Dr.Paria, Books and Allied (P) Ltd.,1999.
7. V.Sundaresan,K.S. Ganapathy Subramaian and K.Ganesan, Resource Management Techniques, A.R Publications.

e-Resources:

1. http://ebooks.lpude.in.operationsresearch.
2. https://ocw.mit.edu

UNIVERSITY OF MADRAS

UG – NON-MAJOR ELECTIVE COURSE

OFFERED IN THE DEPARTMENT OF MATHEMATICS

SYLLABUS WITH EFFECT FROM 2020-2021

NME-I: FUNCTIONAL MATHEMATICS-I

UNIT I

Ratio and Proportion

UNIT II

Percentages

UNIT III

Profit and Loss, Discounts

UNIT IV

Simple Interest and Compound interest

UNIT V

Solutions of Simultaneous equations, Problems on Ages and Numbers.

Reference:

Quantitative Aptitude- R.S. Agarwal

UNIVERSITY OF MADRAS

UG – NON-MAJOR ELECTIVE COURSE

OFFERED IN THE DEPARTMENT OF MATHEMATICS

SYLLABUS WITH EFFECT FROM 2020-2021

NME-II: FUNCTIONAL MATHEMATICS-II

UNIT I

Time and work – Pipes and cisterns- Problem

UNIT II

Time and Distance, Relative speeds- Problems on Races, Boats and Trains.

UNIT III

Mensuration – Problems

UNIT IV

Polygons – Interior angles- Number of diagonals- Regular Polygons- Problems

UNIT V

Stocks and Shares – Problems

Reference:

1. Quantitative Aptitude- R.S. Agarwal
2. Functional Mathematics, M. Sivananda Rani, Margham Publications, Chennai.

UNIVERSITY OF MADRAS
U.G. DEGREE COURSES

அடிப்படைத்தமிழ்ப்பாடம் (BASIC TAMIL)

முதற் பருவம் **2 மதிப்பீடுகள்**

தமிழ் மொழியில் அடிப்படைக்கூறுகள்

1. எழுத்துக்கள் : முதல் எழுத்துக்கள்

1. உயிர எழுத்து, ஆய்த எழுத்து
2. மெய் எழுத்து
3. உயிர் மெய் எழுத்து

2. சொற்கள்

1. பெயர் சொல்
2. வினை சொல்
3. இடைசொல்
4. உரி சொல்

3. தொடரமைப்பு

1. எழுவாய்
2. பயனிலை
3.செயப்படுப்பொருள்

4. (a) பிழை நீக்கம்

1. ஒற்றுப் பிழை
2. எழுத்துப் பிழை
3. தொடர் பிழை

(b) எண்கள் (Numerals), உறவுப் பெயர்கள், வாழ் இடங்களும், பொருள்களும்

5. **அறிமுகம்**

1. விழாக்கள்
2. இயற்கை
3. உணவு முறைகள் -சுவை-காய்கள் பழங்கள்

NOTE: The mode of conduct of Examination for Part-IV-Basic Tamil (I&II Semesters) are as follows: அடிப்படைத் தமிழுக்கு விடையைத் தேர்ந்தெடுத்தல் முறையின்படி (objective type) 50 வினாக்கள் கொடுக்கப்பட வேண்டும். ஓவ்வொரு வினாவிற்கும் 2 மதிப்பெண்கள் வீதம் எழுத்துத் தேர்வில் 100க்கு மதிப்பெண்கள் வழங்கி பின்னர் 75க்கு மாற்றம் செய்ய வேண்டும். அகமதிப்பீட்டிற்கு உள்ள 25 மதிப்பெண்களுடன் எழுத்துத் தேர்வு மதிப்பெண்ணையும் சேர்த்து 100க்கு மொத்தமாக வழங்கலாம்.

***
**

சென்னைப்பல்கலைக்கழகப்பாடத்திட்டமாற்றம்
2020 ஆம்கல்வியாண்டு முதல்
பொதுத்தமிழ் – (Foundation Course)
B.A./B.Sc.,/B.Com.,

பொதுத்தமிழ் முதற்பருவம்

பாடப்பகுப்பு

I இலக்கியம்

II பாடம் சார்ந்த தமிழிலக்கியவரலாறு

III மொழிப்பயிற்சி

முதல் பருவம்

I இலக்கியம்

அலகு 1

மரபுக்கவிதை

- பாரதியார் - பாரதசமுதாயம்.
- பாரதிதாசன் – ஒற்றுமைப்பாட்டு
- கவிமணி தேசிகவிநாயகம்பிள்ளை - உடல்நலம் பேணல்
- நாமக்கல் கவிஞர்வெ. இராமலிங்கம்பிள்ளை - தமிழன் இதயம்
- கவிஞர் கண்ண தாசன் - குடும்பம் ஒரு கதம்பம்
- பட்டுக்கோட்டைஅ . கல்யாணசுந்தரம் - வருங்காலம் உண்டு
- தமிழ்ஒளி - வழிப்பயணம்

புதுக்கவிதை

- கவிஞர்ந. பிச்சமூர்த்தி - காதல், லீலை
- கவிஞர் அப்துல்ரகுமான் - பித்தன்
- கவிஞர் மு.மேத்தா - ஒருகடிதம் அனாதையாகிவிட்டது, நிழல்கள்
- கவிஞர் இன்குலாப் –
  ஒவ்வொருபுல்லையும் பெயர்சொல்லி அழைப்பேன்
- கவிஞர் தமிழன்பன் - சொல்லில் உயர்வுதமிழ்ச்சொல்லே
- கவிஞர்வைரமுத்து – விதைச்சோளம்
- கவிஞர் அ.சங்கரி - இன்றுநான்பெரியபெண்

அலகு 2

- ஏற்றப்பாட்டு
- தெம்மாங்கு
- அம்பாபாடல்கள்
- விளையாட்டுப்பாடல்கள்
- நடவுப்பாடல்கள்

அலகு 3

சிறுகதைகள்

- கு.ப.ரா - கனகாம்பரம்
- கு.அழகிரிசாமி – குமாரபுரம்ஸ்டேஷன்
- தமிழ்ச்செல்வன் - வெயிலோடுபோய்
- தோப்பில் முகமது மீரான் - வட்டக்கண்ணாடி
- அம்பை - பிளாஸ்டிக்டப்பாவில் பராசக்தி முதலியோர்

உரைநடை

• இரா.பி.சேதுப்பிள்ளை - வண்மையும்வறுமையும்

அலகு 4

• நா.முத்துசாமி - நாற்காலிக்காரர்

அலகு 5

தமிழிலக்கியவரலாறு

• மரபுக்கவிதை - இருபதாம் நூற்றாண்டுகவிஞர்கள்

• புதுக்கவிதை

• நாட்டுப்புறப்பாடல்கள், கதைகள், கதைப்பாடல்கள், பழமொழிகள், விடுகதைகள் சிறுகதை, உரைநடைவரலாறு

• நாடகம் - சார்ந்த பகுதிகள்

அலகு 6

மொழிப்பயிற்சி

- வாக்கியவகை (தொடர்வாக்கியம், தனிவாக்கியம், கூட்டுவாக்கியம்)
- இருவழக்குகள் (பேச்சு, எழுத்து)
- எழுவாய், பயனிலை, செயப்படுபொருள்
- ஒருமை, பன்மைமயக்கம்
- திணை, பால், எண், இடவேறுபாடு
- நால்வகைச்சொற்கள் (பெயர், வினை, இடை, உரி)
- அகரவரிசைப்படுத்துதல்

மதிப்பெண்பங்கீடு- I & II- 50 மதிப்பெண்கள்

III - 25 மதிப்பெண்கள்

****

சென்னைப்பல்கலைக்கழகப்பாடத்திட்டமாற்றம்
2020 ஆம்கல்வியாண்டு முதல்
பொதுத்தமிழ் - (Foundation Course)
B.A./B.Sc.,/B.Com.,

<u>பொதுத்தமிழ் இரண்டாம்பருவம்</u>

மொத்த மதிப்பெண்கள் – 75

பாடப்பகுப்பு

I இலக்கியம்

II அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III மொழிப்பயிற்சி

I இலக்கியம்

<u>அலகு 1</u>

1. நற்றிணை - 61 , 88
2. குறுந்தொகை -87,88,89
3. கலித்தொகை - 11 ஆம்பாடல் - அரிதாய அறன் எய்தி

<u>அலகு 2</u>

1. அகநானூறு - 86 ஆம்பாடல் (உழுந்துதலைபெய்த)
2. ஐங்குறுநூறு - கிள்ளைப்பத்து
3. பரிபாடல் - செவ்வேள் 5 (கடுவன் இளவெயினார் (1 முதல் 10 வரிகள் - வெற்றிவேல்)

<u>அலகு 3</u>

1. புறநானூறு - 48, 292
2. பதிற்றுப்பத்து -காக்கைப்பாடினியார், நச்செள்ளையார்பாடல்கள்

(56,57)

<u>அலகு 4</u>

1. பத்துப்பாட்டு - முல்லைப்பாட்டு (முழுவதும்)

அலகு 5

1. திருக்குறள் - பொருட்பால் - 3 அதிகாரம் (காலமறிதல், சுற்றந்தழால், கண்ணோட்டம்)
2. நாலடியார் -ஈகை (முதல் 5 பாடல்கள்)

II தமிழிலக்கியவரலாறு

1. முச்சங்கவரலாறு , பதினெண்மேற்கணக்குநூல்கள் (எட்டுத்தொகை, பத்துப்பாட்டு)
2. பதினெண்கீழ்க்கணக்கு நூல்கள்

III மொழிப்பயிற்சி

1. இலக்கணக்குறிப்பு (வேற்றுமைத்தொகை, உவமைத்தொகை, பண்புத்தொகை, உம்மைத்தொகை, அன்மொழித்தொகை) [பத்தியிலிருந்து இலக்கணக்குறிப்புகளைக்கண்டறிதல்]
2. ஒற்றுமிகும்மிகாஇடங்கள்
3. மரபுத்தொடர்கள் (தமிழ்மரபுத்தொடர்களைக்கண்டறிதல்)

மதிப்பெண்பங்கீடு - I & II இலக்கியம் - 50

III மொழிப்பயிற்சி - 25

சென்னைப்பல்கலைக்கழகப்பாடத்திட்டமாற்றம்
2020 ஆம்கல்வியாண்டு முதல்
பொதுத்தமிழ் - (Foundation Course)
B.A./B.Sc.,/B.Com.,

<u>பொதுத்தமிழ் மூன்றாம்பருவம்</u>

மொத்த மதிப்பெண்கள் - 75

பாடப்பகிர்வு

I இலக்கியம்

II.அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III. மொழிப்பயிற்சியும் மொழிபெயர்ப்பும்

I இலக்கியம்

<u>அலகு 1</u>

1.காரைக்கால் அம்மையார் - அற்புதத்திருவந்தாதி
("பிறந்துமொழி" எனத்தொடங்கி 5 பாடல்கள்)

2.தேவாரம் - திருஞானசம்பந்தர் - திருத்தில்லைபதிகம்
"**கற்றாங்கு"**எனத்தொடங்கி11 பாடல்கள்

3. திருநாவுக்கரசர் - "மாசில் வீணையும்" எனத்தொடங்கி 10 பாடல்கள்

4. சுந்தரர் - "பித்தாபிறைசூடி"எனத்தொடங்கி 10 பாடல்கள்

5. மாணிக்கவாசகர் - திருப்பள்ளியெழுச்சி 10 பாடல்கள்

<u>அலகு 2</u>

1. ஆண்டாள் - நாச்சியார்திருமொழி – ஏழாம்பத்து

2. பொய்கையாழ்வார், பூதத்தாழ்வார், பேயாழ்வார் - முதல் பாடல்

3. நம்மாழ்வார் - முதல் பத்து - நான்காம்திருமொழிமுதல் 5 பாடல்கள்

<u>அலகு 3</u>

1. தாயுமானவர் - பைங்கிளிகண்ணி (5 கண்ணிகள்)

2. வள்ளலார் - திருவருட்பா - பிள்ளைச்சிறுவிண்ணப்பம் (1-5)

3. அருணகிரிநாதர் - விநாயகர்துதி - நினதுதிருவடி எனத்தொடங்கும் 5 ஆம்பாடல்

அலகு 4

1. சித்தர்பாடல்கள் - திருமூலர் - திருமந்திரம் (270,271,274,275,285)
2. குணங்குடிமஸ்தான் - பராபரக்கண்ணி (முதல்பத்துக்கண்ணிகள்)
3. வேதநாயகம்பிள்ளை - தாய்தந்தையர்வணக்கம் 25 - 32 வரிகள்

   (பெண்மதிமாலை)

அலகு 5

1. முத்தொள்ளாயிரம்
2. தமிழ்விடுதூது – முதல் 16கண்ணிகள்
3. நந்திக்க லம்பகம்(61, 96, 100, 105, 110)

II தமிழிலக்கியவரலாறு

1. பக்தி இலக்கியம் (சைவம், வைணவம், சித்தர்கள், இஸ்லாம், கிறித்துவம்)
2. சிற்றிலக்கியங்கள்

II மொழிப்பயிற்சியும் மொழிபெயர்ப்பும்

ஒருபொருள்குறித்த பலசொல் , பலபொருள் குறித்த ஒரு சொல், பிறமொழிச்சொல்நீக்கல், அலுவலகக்கடிதம்வரைதல், தமிழில்மொழிபெயர்த்தல்

மதிப்பெண்பங்கீடு I & II - 50

III – 25

சென்னைப்பல்கலைக்கழகப்பாடத்திட்டமாற்றம்
2020 ஆம்கல்வியாண்டு முதல்
பொதுத்தமிழ் - (Foundation Course)
B.A./B.Sc.,/B.Com.,

<u>பொதுத்தமிழ்நான்காம் பருவம்</u>

மொத்த மதிப்பெண்கள் - 75

பாடப்பகிர்வு -

I இலக்கியம்

II அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III மொழித்திறன்

I இலக்கியம்

<u>அலகு 1</u>

1. சிலப்பதிகாரம் - ஊர்க்காண்காதை
2. மணிமேகலை - பாத்திரமரபுகூறியகாதை

<u>அலகு 2</u>

1. சீவகசிந்தாமணி - ஏமாங்கதநாட்டுவளம் 10 பாடல்கள் மட்டும்
2. சூளாமணி - 5 பாடல்கள் (நாட்டுச்சருக்கம், நகரச்சருக்கம்,

   தூது சருக்கம், கல்யாணச்சருக்கம், சுயம்வரச்சருக்கம்)

<u>அலகு 3</u>

1. கம்பராமாயணம் - குகப்படலம்
2. பெரிய புராணம் - மெய்ப்பொருள் நாயனார் புராணம்

<u>அலகு 4</u>

1. சீறாப்புராணம் - உடும்பு பேசிய படலம் - 40 பாடல்கள்
2. தேம்பாவணி - வளன் சனித்தபடலம் - 31 பாடல்கள்

அலகு 5

1. மீனாட்சியம்மைபிள்ளைத்தமிழ் - வருகைப்பருவம் - 5 பாடல்கள்
2. திருக்குற்றாலக்குறவஞ்சி - மலைவளம்

II இலக்கியவரலாறு

1. காப்பிய இலக்கியங்கள்
2. சிற்றிலக்கியங்கள்
3. இஸ்லாமிய இலக்கியவரலாறு
4. கிறித்துவ இலக்கியவரலாறு

III மொழித்திறனறிதல்

i. கலைச்சொற்கள்

ii. படைப்பு - சிறுகதை (அ) புதுக்கவிதை

மதிப்பெண்பங்கீடு - I & II- 50

III - 25

UNIVERSITY OF MADRAS
UG & 5 YR INTEGRATED DEGREE COURSES
SYLLABUS – OTHER LANGUAGES

PART-I - HINDI
(With effect from the Academic Year 2015-2016)

I YEAR – I SEMESTER

PAPER – I - PROSE, FUNCTIONAL HINDI & LETTER WRITING

I . PROSE (Detailed Study) : HINDI GADHYA MALA
Ed. by Dr. Syed Rahamathulla
Poornima Prakashan, 4/7 Begum III Street
Royapettah, Chennai – 14.

LESSONS PRESCRIBED :

1. Sabhyata ka Rahasya
2. Mitrata
3. Yuvavon sen
4. Paramanu Oorja evam Khadya Padarth Sanrakshan
5. Yougyata aur Vyavasay ka Chunav.

II. FUNCTIONAL HINDI & LETTER WRITING

Students are expected to know the office and Business Procedures, Administrative and Business Correspondence.

1. General Correspondence:
    1. Personal Applications
    2. Leave Letters
    3. Letter to the Editor
    4. Opening an A/C
    5. Application for Withdrawal
    6. Transfer of an A/C
    7. Missing of Pass Book / Cheque Leaf
    8. Complaints
    9. Ordering for Books
    10. Enquiry

III. OFFICIAL CORRESPONDENCE:
    1. Government Order
    2. Demi Official Letter
    3. Circular
    4. Memo
    5. Official Memo
    6. Notification
    7. Resolution
    8. Notice

BOOKS FOR REFERENCE :

1. Karyalayeen Tippaniya : Kendriya Hindi Sansthan, Agra
2. Prayojan Moolak Hindi : Dr. Syed Rahamathulla, Poornima Prakashan
4/7, Begum III Street, Royapettah, Chennai – 14.

UNITISED SYLLABUS

UNIT – I
1. Sabhyata ka Rahasya
2. Personal Applications
3. Leave Letters
4. Government Order
5. Administrative Terminology Hindi to English (25 Words)

UNIT - II
1. Mitrata
2. Letter to the Editor
3. Opening an A/C
4. Demi Official Letter
5. Administrative Terminology English to Hindi (25 Words)

UNIT-III
1. Yuvavon Se
2. Application for Withdrawal
3. Circular
4. Memo
5. Administrative Terminology Hindi to English (25 Words)

UNIT-IV
1. Paramanu Oorja evam Khadya Padarth Sanrakshan
2. Transfer of an A/C
3. Missing of Pass Book / Cheque Leaf
4. Official Memo
5. Administrative Terminology English to Hindi (25 Words)

UNIT-V
1. Yougyata aur Vyavasay ka Chunav
2. Complaints
3. Ordering for Books
4. Notification
5. Official Noting Hindi to English (25 words)

UNIT-VI
1. Enquiry
2. Resolution
3. Notice
4. Official Noting English to Hindi (25 words)

PAPER – I - PROSE, FUNCTIONAL HINDI & LETTER WRITING

QUESTION PAPER PATTERN

Time : 3 Hours Maximum Marks : 75

SECTION – A (5x3= 15)

I Answer any **5 out of 8** Questions . Answer in **50 Words**
i) 1 to 4 from Prose

ii) 5 to 8 from Functional Hindi

5) Equivalent Administrative Terminology six from English to Hindi 6 out of 10 Q
6) Equivalent Administrative Terminology six from Hindi to English 6 out of 10 Q
7) Equivalent Official Phrases three out of five from English to Hindi 3 out of 5 Q
8) Equivalent Official Phrases three out of five from Hindi to English 3 out of 5 Q

SECTION – B (in **200 words**)(3x5= 15)

II. a) Three Annotations out of Five (3x5 = 15)
(Q. No.9 to 13 annotations from Prose only)
b) One Question from out of two (1x5 = 5)
(Q. No.14 to 15)
(Definition and references of official letter i.e., D.O., Circular, Order, Memo, Notification, Resolution, Notice Etc.)

SECTION C (4X 10 = 40)

III. Answer in **500 Words**
a) Two essays out of Three from Prose (2x10 = 20)
(Q. No. 16 to 18)
b) Two Letter out of Three (2x10 =20)
(Q. No.19 to 21)
(From General Correspondence i.e. Personal Applications, Leave Letters, Letter to Editor, Opening an A/C, Application for withdrawal, Transfer of an account, Missing of Pass Book/Cheque leaf, Insurance Letters, Ordering Books, Enquiry, Complaints, Exchange, Damages etc.)

I YEAR – II SEMESTER

PAPER – II – ONE ACT PLAY, SHORT STORY & TRANSLATION

I . **ONE ACT PLAY** (Detailed Study): **AATH EKANKI**

Edited By: Devendra Raj Ankur, Mahesh Aanand
Vani prakashan, 4695, 21-A Dariyagunj,; New Delhi – 110 002

LESSONS PRESCRIBED :

1. Aurangazeb ki Aakhari Raat
2. Laksmi Ka Swagat
3. Basant Ritu ka Naatak
4. Bahut Bada Sawal

II. **SHORT STORIES** (Non- Detailed Study): **SWARNA MANJARI**

Edited by: Dr. Chitti. Annapurna
Rajeswari Publications
21/3, Mothilal Street, (Opp. Ranganathan Street),
T. Nagar, Chennai – 600 017.

LESSONS PRESCRIBED :

1. Mukthidhan
2. Mithayeewala
3. Seb aur Dev
4. Vivah ki Teen Kathayen

III. **TRANSLATION PRACTICE** : (English to Hindi)

BOOKS FOR REFERENCE :

1. Prayojan Moolak Hindi : Dr. Syed Rahamathulla
Poornima Prakashan, 4/7, Begum III Street,
Royapettah, Chennai – 14.
2. Anuvad Abhyas Part III Dakshin Bharat Hindi Prachar Sabha
T. Nagar, Chennai -17.

UNITISED SYLLABUS

UNIT – I

1. Auranzeb ki Aakhiri Raat
2. Mukthidhan
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT – II

1. Laksmi ka Swagat
2. Mithayeewala
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT-III
1. Basant Ritu ka Natak
2. Seb Aur Dev
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT-IV
1. Bahut Bada Sawal
2. Vivah ki Teen Kathayen
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT-V
1. Translation Practice. (English to Hindi)

QUESTION PAPER PATTERN

Time : 3 Hours Maximum Marks : 75

SECTION – A (5x3= 15)

I Answer any **5 out of 8** Questions . Answer in **50 Words**

i) 1 to 4 from One Act Play
ii) 5 to 8 from Short Stories

SECTION – B (in **200 words**)(3x5= 15)

II. a) Three Annotations out of Five (3x5 = 15)
(Q. No.9 to 13 annotations from One Act Play only)
b) One Question out of two (1x5 = 5)
(Q. No.14 to 15)
(One characteristic out of two from short stories)

SECTION C (4X 10 = 40)

III. Answer in **500 Words**

a) Literary Evaluation of One Act Play -2 out of 3 (2x10 = 20)
(Q. No. 16 to 18)
b) Literary Evaluation of Short Story 1 out of 2 (2x10 =20)
(Q. No.19 to 20)
c) One Translation passage from English to Hindi (1x10=10)
(Q. No. 21)

II YEAR - III SEMESTER

Paper III Ancient Poetry and Introduction to Hindi Literature
(Upto ReetiKaal)

1. Ancient Poetry

Prescribed Text Book : Selections in Poetry (2007)
University Publications
University of Madras .

Lessons Prescribed :

1. Kabirdas - Saakhi (Dohas from 1 to 10)
2. Surdas - Bramargeet Saar only
3. Tulasidas – Vinay ke Pad only
4. Meera Bai – Pad only
5. Tiruvalluar (Dharmakaand only)
6. Biharilal (Dohas 1 to 5)

2. Introduction to Hindi Literature (up to Reethikaal)

Lessons Prescribed :

1. Literary Trends of Veeragatha Kaal (Aadikaal) - Important poets : 1. Chand Baradai 2. Vidhyapathi and their Works

2. Literary Trends of Bhakthi Kaal – Important Poets : 1. Kabirdas 2. Joyasi 3. Tulasidas 4. Surdas and their works

3. Literary Trends of Reethikaal – Important Poets : 1. Bihari 2. Bhushan 3. Ghananand

Reference Books :

1. Hindi Sahithya Ka Itihas
   By: Ramchandra Shukla , Jayabharathi Publications, 217, B, Maya Press Road, Allahabad – 211 003.
2. Hindi Sahithya Yug Aur Pravrithiya
   By: Dr. Sivakumar Varma,
   Asok Prakashan Nayi Sarak, New Delhi – 6
3. Hindi Sahithya ka Sybodh Itihas
   By : Babu Gulabroy, Lakshmi Narayanan Agarwas Book Publishers seller,Anupama Plaza -1, Block.No.50, Sanjay Place, Agra- 282002.

Unit wise Syllabus for III Semester

UNIT –I

1. Kabirdas - Saakhi (Dohas from 1 to 10)
2. Literary Trends of Veeragatha Kaal (Aadikaal)
3. Chand Baradai and his Works
4. Vidhyapathi and his Works

UNIT - II

1. Surdas - Bramargeet Saar
2. Literary Trends of Bhakthi Kaal
3. Gyan Margi Shakha
4. Important Poet : 1. Kabirdas

UNIT - III

1. Tulasidas – Vinay ke Pad only
2. Literary Trends of Bhakthi Kaal – Prem Margi Shakha
3. Literary Trends of Bhakthi Kaal - Ram Bhakthi Shakha
4. Important Poets – 1. Joyasi and 2. Tulasidas

UNIT - IV

1. Meera Bai – Pad only
2. Tiruvalluar (Dharmakaand only)
3. Literary Trends of Bhakthi Kaal – Krishna Bhakthi Shakha
4. Important Poet – Surdas

UNIT - V

1. Biharilal (Dohas 1 to 5)
2. Literary Trends of Reethikaal
3. Important Poet : Bihari and his works
4. Bhushan and his works and Ghananand and his works

QUESTION PAPER PATTERN

Time : 3 Hours **Maximum Marks : 75**

SECTION- A (5x3=15)

I. Answer **any 5 out of 8** Questions – Give Answer in **50 Words**

i) 1 to 4 from Poetry Selection

ii) 5 to 8 from Sahithya ka itihas

SECTION- B (4x5=20)

II. a) Four Annotations out of **Seven**

(Q.No.9 to 15 annotations from Poetry Selection)

SECTION- C (4x10=40)

Answer in **500 Words**

1) Literary Evaluation of Poems 2 out of 3 (2 X 10 = 20)
(Q. No. 16 to 18)
2) Essays from History of Hindi Literature 1 out of 2 (1 X 10 = 10)
(Q. No. 19 to 20)
3) Brief note on Poets and Writings (1 X 10 + 10)
(Any 2 out of 4) (Q. No. 21)

II YEAR - IV SEMESTER

Paper –IV Modern Poetry And Introduction To Hindi Literature (Aadhunik Kaal)"

1. Modern Poetry

Prescribed Text Book : Selections in Poetry
University Publications, University of Madras .

Lessons Prescribed :

1. Asha – (Jayashankar Prasad)
2. Tum Logon se Door (Nagarjun)
3. Kavi Aur Kalpana – (Dhramaveer Bhaarathi)
4. Bharat Ki Aarthi - (Shamsher Bahadhur Singh)
5. Varadan Mangoonga Nahi (Siva Mangal Singh Suman)
6. Anevalon Se Ek Savaal (Bharat Bhooshan Agarwal)

2. Introduction to Hindi Literature (Aadhunik Kaal)

Lessons Prescribed :

1. Literary Trends of Chayavaad
2. Literary Trends of Pragathivaad
3. Literary Trends of Nayee Kavita
4. Literary Trends of Hindi Short Stories
5. Literary Trends of Hindi One Act Plays
6. Brief Note on the writers and their works
   Maithili Saran Gupta, Jayashankar Prasad, Nirala, Mahadevi Varma, Panth, Dinakar, Premchand, Yashpaal Jainendra Kumar, Mohan Rakesh,

Reference Books :

1. Hindi Sahithya Ka Itihas
   By: Ramchandra Shukla , Jayabharathi Publications, 217, B, Maya Press Road, Allahabad – 211 003.
2. Hindi Sahithya Yug Aur Pravrithiya
   By: Dr. Sivakumar Varma,
   Asok Prakashan Nayi Sarak, New Delhi – 6
3. Hindi Sahithya ka Sybodh Itihas
   By : Babu Gulabroy, Lakshmi Narayanan Agarwas Book Publishers seller,Anupama Plaza -1, Block.No.50, Sanjay Place, Agra- 282002.

Unit wise Syllabus for IV Semester

UNIT -I

1. Asha – (Jayashankar Prasad)
2. Tum Logon se Door (Nagarjun)
3. Literary Trends of

Chayavaad UNIT - II

1. Kavi Aur Kalpana – (Dhramaveer Bhaarathi)
2. Bharat Ki Aarthi - (Shamsher Bahadhur Singh)
3. Literary Trends of

Pragathivaad UNIT - III

1. Varadan Mangoonga Nahi (Siva Mangal Singh Suman)
2. Anevalon Se Ek Savaal (Bharat Bhooshan Agarwal)
3. Literary Trends of Nayee Kavita

UNIT –IV

1. Literary Trends of Hindi Short Stories
2. Literary Trends of Hindi One Act

Plays UNIT- V

1. Maithili Saran Gupta, Jayashankar Prasad, Nirala,
2. Mahadevi Varma, Panth, Dinakar, Premchand,
3. Yashpaal Jainendra Kumar, Mohan Rakesh,

QUESTION PAPER PATTERN

Time : 3 Hours **Maximum Marks : 75**

SECTION- A (5x3=15)

I. Answer **any 5 out of 8** Questions – Give Answer in **50 Words**

i) 1 to 4 from Poetry Selection

ii) 5 to 8 from Sahithya ka itihas

SECTION- B (4x5=20)

II. a) Four Annotations out of **Seven**

(Q.No.9 to 15 annotations from Poetry Selection)

SECTION- C (4x10=40)

Answer in **500 Words**

1) Literary Evaluation of Poems 2 out of 3 (2 X 10 = 20)
(Q. No. 16 to 18)

2) Essays from History of Hindi Literature 1 out of 2 (1 X 10 = 10)
(Q. No. 19 to 20)

3) Brief note on Poets and Writings (1 X 10 + 10)
(Any 2 out of 4) (Q. No. 21)

*****

UNIVERSITY OF MADRAS
UG & 5 YR INTEGRATED DEGREE COURSES
SYLLABUS – OTHER LANGUAGES

PART – I: FRENCH
(with effect from 2018-2019)

SEMESTER I

Title of the Paper : Prescribed text and grammar-I

Prescribed textbook:

- Régine Mérieux & Yves Loiseau, *Latitudes 1*, Paris, Didier, 2017 (**Units 1-6 only).**

Questions not to be asked from the Autoévaluation and Préparation au DELF

Paper setters to strictly adhere to the syllabus and ask questions only from the pages included in the syllabus. Questions should cover the entire syllabus.

QUESTION PAPER PATTERN

Time : 3 Hours Maximum Marks : 75

Section A (7 x 5 = 35 Marks)

Answer any 7 questions
10 Grammar exercises to be given from the prescribed textbook

Section B (10 x 2 = 20 Marks)

Answer any TEN questions
15 questions to be asked on cultural aspects found in the prescribed textbook

Section C (2 x 10 = 20 Marks)

Answer any TWO
2 must be answered out of 4 topics (1 dialogue writing, 1 letter /email writing, 2 compositions based on the themes found in the prescribed textbook)

Foundation Course: Paper II-French II
Title of the Paper : Prescribed text and grammar-II

Prescribed textbook:

- Régine Mérieux & Yves Loiseau, *Latitudes 1*, Paris, Didier, 2017 (**Units 7-12 only).**

Questions not to be asked from the Autoévaluation and Préparation au DELF

Paper setters to strictly adhere to the syllabus and ask questions only from the pages included in the syllabus. Questions should cover the entire syllabus.

QUESTION PAPER PATTERN

Time : 3 Hours Maximum Marks : 75

Section A (7 x 5 = 35 Marks)

Answer any 7 questions

10 Grammar exercises to be given from the prescribed textbook

Section B (10 x 2 = 20 Marks)

Answer any TEN questions

15 questions to be asked on cultural aspects found in the prescribed textbook

Section C (2 x 10 = 20 Marks)

Answer any TWO

2 must be answered out of 4 topics (1 dialogue writing, 1 letter /email writing, 2 compositions based on the themes found in the prescribed textbook)

UNIVERSITY OF MADRAS

SEMESTER II

UG & 5 YR INTEGRATED DEGREE COURSES

SYLLABUS – OTHER LANGUAGES

Foundation Course: Paper III-French III

Title of the Paper : Translation, Comprehension and Grammar-I

Prescribed textbook:

- K.Madanagobalane & N.C.Mirakamal, *Le français par les textes*, Chennai, Samhita Publications-Goyal Publisher & Distributors Pvt Ltd, 2017

The following grammar components are chosen from the prescribed textbook:

- Les pronoms relatifs
- Le passé composé
- L'imparfait
- Le plus-que-parfait
- Le subjonctif
- Le conditionnel
- La comparaison

The following texts from the prescribed textbook:

- Les feuilles mortes
- Le vrai Père
- Nos études
- Demain dès l'aube
- Par une journée d'été
- Une visite inattendue
- L'hiver
- Le Libraire

Paper setters to strictly adhere to the syllabus and ask questions only from the pages included in the syllabus. Questions should cover the entire syllabus.

QUESTION PAPER PATTERN

Time : 3 Hours Maximum Marks : 75

Section A (25 Marks)

Answer ALL questions

1. Translate the following passage from the prescribed text into English (10 Marks)
2. Translate the unseen passage into English (15 Marks)

Section B (25 Marks)

Answer ALL questions

1. FIVE Questions on Comprehension of a passage from the prescribed text (5 x 2 = 10 Marks)
2. FIVE Questions on Comprehension of an unseen passage (5 x 3 = 15 Marks)

Section C (5 x 5 = 25 Marks)

Answer any FIVE exercises

7 grammar exercises to be given from the prescribed text.

Foundation Course: Paper IV-
French IV
Title of the Paper : Translation, Comprehension and Grammar-II

Prescribed textbook:

- K.Madanagobalane & N.C.Mirakamal, *Le français par les textes*, Chennai, Samhita Publications-Goyal Publisher & Distributors Pvt Ltd, 2017

The following grammar components are chosen from the prescribed textbook:

- Le passé simple
- Temps du passé - Emplois (le passé composé, l'imparfait, le passé simple, le plus-que-parfait)
- L'expression de la cause
- L'expression de la conséquence
- L'expression du but
- L'expression de la concession
- L'expression de la condition et de l'hypothèse

The following texts from the prescribed textbook:

- Décadi et son grand-père
- Le Petit chose
- L'égoïste puni
- Estula
- Une Saison dans la vie d'Emmanuel
- Une mauvaise nouvelle
- La visite de la grand-mère
- *Le Horla*

Paper setters to strictly adhere to the syllabus and ask questions only from the pages included in the syllabus. Questions should cover the entire syllabus.

QUESTION PAPER PATTERN

Time : 3 Hours Maximum Marks : 75

Section A (25 Marks)

Answer ALL questions

1. Translate the following passage from the prescribed text into English (10 Marks)
2. Translate the unseen passage into English (15 Marks)

Section B (25 Marks)

Answer ALL questions

1. FIVE Questions on Comprehension of a passage from the prescribed text (5 x 2 = 10 Marks)
2. FIVE Questions on Comprehension of an unseen passage (5 x 3 = 15 Marks)

Section C (5 x 5 = 25 Marks)

Answer any FIVE exercises

7 grammar exercises to be given from the prescribed text.

****

UNIVERSITY OF MADRAS

U.G. DEGREE COURSE

ENVIRONMENTAL STUDIES PROGRAMME

ABILITY ENHANCEMENT COMPULSORYCOURSES

(AECC- Environmental Studies)

Syllabus with effect from the academic year 2018-2019

(i.e. for batch of candidates admitted to the course from the academic year 2017-18)

Credits: 2 II Year / III/IV Sem.

Unit 1: Introduction to Environmental Studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; concept of sustainability and sustainable development.

Unit 2 : Ecosystem (2 lectures)

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem:
  Food chains, food webs and ecological succession, Case studies of the following ecosystem:
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

Unit 3: Natural Resources : Renewable and Non – renewable Resources (6 lectures)

- Land resources and landuse change: Land degradation, soil erosion and desertification.
- Deforestation : Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water : Use and over –exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter-state).
- Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation (8 lecturers)

- Levels of biological diversity: genetics, species and ecosystem diversity, Biogeographic zones of India: Biodiversity patterns and global biodiversity hot spots
- India as a mega- biodiversity nation, Endangered and endemic species of India.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions; Conservations of biodiversity: In-situ and Ex-situ Conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution (8 lecturers)

- Environmental pollution: types, causes, effects and controls: Air, Water, soil and noise Pollution.
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste
- Pollution case studies.

Unit 6: Environmental Policies & Practices (8 lecturers)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human Wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment (7 lectures)

- Human population growth, impacts on environment, human health and welfare.
- Resettlement and rehabilitation of projects affected persons; case studies.
- Disaster management: floods, earthquake, cyclone and landslides.
- Environmental movements : Chipko, Silent Valley, Bishnois of Rajasthan.
- Environmental ethics : Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies(e.g. CNG Vehicles in Delhi)

Unit 8 : Field Work (6 lectures)

- Visit to an area to document environmental assets: river / forest/ flora/ fauna etc.
- Visit to a local polluted site – Urban / Rural/ Industrial/ Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystem- pond, river, Delhi Ridge etc.

(Equal to 5 Lectures)

Suggested Readings:

1. Carson , R. 2002.Slient Spring, Houghton Mifflin Harcourt.
2. Gadgil , M.,& Guha, R. 1993.This Fissured Land: An Ecological History of India. Univ.of California Press.
3. Glesson, B. and Low, N.(eds.)1999. Global Ethics and Environment, London, Routledge.
4. Gleick,P.H.1993.Water Crisis. Pacific Institute for Studies in Dev.,Environment & Security. Stockholm Env.Institute, Oxford Univ.Press.
5. Groom, Martha J., Gary K.Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates,2006.
6. Grumbine,R.Edward, and Pandit,M.K2013.Threats from India's Himalayas dams .Science,339:36-37
7. McCully,P.1996.Rivers no more :the environmental effects of dams(pp.29-64).Zed books.
8. McNeill,John R.2000.Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum,E.P.,Odum, H.T.& Andrees,J.1971.Fundamental of Ecology. Philadelphia Saunders.
10. Pepper,I.L.,Gerba,C.P & Brusseau,M.L.2011.Environmental and Pollution Science. Academic Press.
11. Rao,M.N.& Datta,A.K1987.Waste Water Treatment. Oxford and IBH Publishing Co.Pvt.Ltd.
12. Raven,P.H.,Hassenzahl,D.M & Berg,L.R.2012 Environment.8th edition. John Willey & sons.

13. Rosencranz, A., Divan,S.,& Noble, M.L.2001.Environmental law and policy in India. Tirupathi 1992.
14. Sengupta,R.2003.Ecology and Economics: An approach to sustainable development.OUP
15. Singh,J.S.,Singh,S.P and Gupta,S.R.2014.Ecology,Environmental Science and Conservation. S.Chand Publishing, New Delhi.
16. Sodhi,N.S.,Gibson,L.&Raven ,P.H(eds).2013.Conservation Biology :Voices from the Tropics. John Willey & Sons.
17. Thapar,V.1998.Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren,C.E.1971.Biology and water Pollution Control. WB Saunders.
19. Willson,E.O.2006. The Creation: An appeal to save life on earth..New York: Norton.
20. World Commission on Environment and Development.1987.Our Common Future. Oxford University Press.

*****

UNIVERSITY OF MADRAS
U.G. DEGREE COURSE
PART – IV - VALUE EDUCATION

Common for all U.G. & Five Year Integrated Courses
(Effective from the Academic Year 2012 – 2013)

SYLLABUS

CREDITS: 2 **III YEAR / V SEM**

Objective: Value are socially accepted norms to e valuate objects, persons and situations that form part and parcel of sociality. A value system is a set of consistent values and measures. Knowledge of the values are inculcated through education. It contributes in forming true human being, who are able to face life and make it meaningful. There are different kinds of values like, ethical or moral values, doctrinal or ideological values, social values and aesthetic values. Values can be defined as broad preferences concerning appropriate courses of action or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. There are representative values like, "Equal rights for all", "Excellence deserves admiration". "People should be treated with respect and dignity". Values tend to influence attitudes and behavior and help to solve common human problems. Values are related to the norms of a culture.

UNIT I: Value education-its purpose and significance in the present world – Value system – The role of culture and civilization – Holistic living – balancing the outer and inner – Body, Mind and Intellectual level – Duties and responsibilities.

UNIT II: Salient values for life – Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self esteem and self confidence, punctuality – Time, task and resource management – Problem solving and decision making skills – Interpersonal and Intra personal relationship – Team work – Positive and creative thinking.

UNIT III: Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr.A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

UNIT IV: Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment.

UNIT V: Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women – How to tackle them.

Books for Reference :

1. M.G. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003.
2. Chakravarthy, S.K: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
3. Satchidananda, M.K: Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991.
4. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D. Publications, New Delhi, 1995.
5. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi, 1999.
6. Ruhela, S.P.: Human Values and education, Sterling Publications, New Delhi, 1986.
7. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai, 1975.
8. NCERT, Education in Values, New Delhi, 1992.
9. Swami Budhananda (1983) How to Build Character A Primer : Rmakrishna Mission, New Delhi.
10. A Culture Heritage of India (4 Vols.), Bharatiya Vidya Bhuvan, Bombay, (Selected Chapters only)
11. For Life, For the future : Reserves and Remains – UNESCO Publication.
12. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
13. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.
14. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
15. Awakening Indians to India, Chinmayananda Mission, 2003.

******