YADAVA COLLEGE

(Autonomous)

Govindarajan Campus, Thiruppalai
Madurai - 625 014

Department of Mathematics

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

CBCS (2022 – 2023)

Course Profile

Final Copy of syllabus incorporating all suggestions made in the meeting of Board of studies held on **06.08.2022**

DEPARTMENT OF MATHEMATICS
UNDERGRADUATE PROGRAMME
COURSE CONTENT
Choice Based Credit System(w.e.f. 2022 – 2023)

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	-	-	-	-	-	-

DEPARTMENT MATHEMATICS
UNDERGRADUATE PROGRAMME
(w.e.f. 2022 – 2023)

Teaching hours and Credit

Subject			Semester								
			I	II	III	IV	V	VI	Total papers	Total Hr	Total 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/PE	Hr	-	-	-	-	-	-	-	-	-
		Cr	-	-	-	-	-	1	-	-	1
Total		Hr	30	30	30	30	30	30	-	180	-
		Cr	21	21	24	24	25	25	-	-	140

YADAVA COLLEGE

DEPARTMENT OF MATHEMATICS

B.Sc Mathematics (R & S/F)

Programme Outcomes:

- To acquire knowledge in various aspect of mathematics.
- To compute the algebraic, geometric and statistical quantities using suitable tools.
- To comprehend the mathematical tools from basic axioms.
- To realize the mathematical applications in other fields.
- To attain analytic thinking.

Programme Specific Outcomes:

- Inculcate the proficiency of writing proofs in pure mathematics papers through assignments.
- To acquire knowledge in analysis which include numbers, sets, functions and convergences.
- Motivate the students in order to acquire knowledge in aptitude examinations.
- Nurture the skill of understanding and explaining the theorems in right way through seminars.
- Nurture the skill of understanding and explaining the theorems in right way through seminars.
- Inculcate the logical thinking and quantitative aptitude

ANALYTICAL GEOMETRY OF 3D & VECTOR CALCULUS

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 3

Objective :
To enable the students

- to provide the students with basic knowledge of Geometry
- to improve their analytical ability in solving Geometric problems
- to attain skills to participate in mathematical competitions and competitive examinations

Unit I

Plane equation - Angle between two planes - Length of the perpendicular - Bisecting plane - Distance between two planes. (Chapter 2- Sections 2.1 ,2.2)

Outcome: To attain knowledge about the angles and planes in two dimensional.

Unit II

The straight-line – Symmetrical form - Image of a point – Image of a line about a plane – The plane and the straight line – Angle between two straight line – Coplanar lines - Shortest distance between two lines. (Chapter 3- Sections 3.1 ,3.2)

Outcome: It is helpful to calculate the shortest distance between two lines.

Unit III

The sphere – Equation of the sphere - Length of the tangent plane- Section of a sphere - Equation of a circle on a sphere. (Chapter 4- Sections 4.1 to 4.3)

Outcome: To get vast knowledge about the sphere.

Unit IV

Vector differentiation – Gradient, divergence, curl - Connected theorems – Problems.(Chapter 5- Sections 5.1 to 5.4)

Outcome: To get knowledge about vector differentiation.

Unit V

Vector integration - Line integral - Surface integral – Volume integral Green's theorem – Stoke's theorem (only statement without proof) - Simple problems

(Chapter 7- Sections 7.1 to 7.3)

Outcome: To demonstrate an understanding of the Green's theorem and Stroke's theorem and also to know about the detailed study of vector integration.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOKS :

1) Analytical Geometry of Three Dimensions and Vector Calculus: Arumugam & Issac – New Gamma Publishing House, Edition 2011.
2) Analytical Geometry of Three Dimensions and Vector Calculus: Manickavasagam Pillai & Narayanan – Viswanathan Publishing Company, First edition 1955. ISBN – 81-87156-03-1.

REFERENCE BOOK :

1) Analytical Geometry – 3D & Vector calculus: Dr.M.K.Venkataraman & Mrs.Manoramasridar - The national publishing company – Chennai.

E-Resources :

1)

https://www.youtube.com/playlist?list=PLJ7oFAsQdm6qKm-cWlCeJBVHN_LJQ4I0y

Course Designed by :

Dr.M.Azhagappan

CALCULUS AND TRIGONOMETRY

Semester : I **Subject code :**

Hours/week : 5 **Total Hours/Semester : 90**

Credit : 3

Objective :

To enable the students

- to acquire knowledge on evaluation techniques of definite & indefinite integrals and to know the knowledge of trigonometry.
- to attain skills to participate in mathematical competitions and competitive examinations

Unit I

Envelops – Curvature - Circle, Radius and Center of curvature – Evolutes - Radius of curvature in polar co-ordinates – Polar equations.

(chapter 10-section 10.1.0 to 10.2.8)

Outcome: Describe the concepts of curvature, evolutes and envelopes.

Unit II

Jacobian - Multiple integrals – double, triple integrals – Beta, gamma functions.

(chapter 6-section 6.1.1 ,6.1.2, chapter 7-section 7.2.1 to 7.5 , chapter 5- 5.1 to 5.4 in calculus II)

Outcome: Discriminate the multiple integrals and beta, gamma functions.

Unit III

Expansion of sin nx , cos nx , tan nx , $\sin^n x$, $\cos^n x$.

(chapter 3- section-3.1 to 3.5 in trigonometry)

Outcome: Gain Knowledge in the expansion of sin nx, cos nx and tan nx.

Unit IV

Hyperbolic functions – Inverse hyperbolic functions – Logarithm of a complex number(chapter 4-4.1,4.2,4.2.2,4.2.3 , chapter 5- 5.5,5.5.1,5.5.2 in trigonometry)

Outcome: Explain the concept of hyperbolic function and logarithm of a complex number.

Unit V

Fourier series - Trigonometric series-Even and odd functions - half range Fourier series. (chapter 6 in sequence and series & Fourier series)

Outcome: Understand the ideas of fourier series and trigonometric series.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOKS :

1) Calculus –Volume I & II :Narayanan And T.K..Manickavasagam Pillai – S.Viswanathan publication – Chennai.

2) Trigonometry : Narayanan & T.K.Manickavasagam pillai, S.Viswanathan Publication.

3) Sequence Series & Fourier Series : Arumugam & Isaac , New gamma publishing.

REFERENCE BOOKS :

1) Differential Calculus : Shanthi Narayanan – S.Chand Company – New Delhi.

2) Integral Calculus : Shanthi Narayanan – S.Chand Company – New Delhi.

3) Engineering Mathematics : A.Singara Velu – S.Chand Company – New Delhi.

Course Designed by :

Dr.B.Vasudevan

CLASSICAL ALGEBRA

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 3

Objective :

- To make the students familiar with the importance of Classical Algebra such as Sequence & Series and Theory of Equations
- To enable the students to attain skills to participate in mathematical competitions and competitive examinations

Unit I

Sequence – Bounded – Monotonic – Convergent – Divergent and Oscillating – The algebra of limits. (In Book 1, Page No. 39 – 68)

Outcome: Acquire knowledge about sequence and the concept of algebra of limits.

Unit II

Behavior of Monotonic Sequence – Some theorems on limits – Subsequence – Limit points – Cauchy Sequence. (In Book 1, Page No. 68 – 103)

Unit III

Series for positive terms – Infinite series - Comparison test – Kummer's test – D'Alemberts test – Raabe's test – De Morgan test - Gauss's test. (In Book 1, Page No. 112 – 144)

Outcome: Learn about the different kinds of series.

Unit IV

Infinite series - Cauchy's root test - Cauchy's Condensation test -Cauchy's integral test – Series of arbitrary terms - Alternating series - Leibnitz's test. (In Book 1, Page No. 145 – 156)

Outcome: Solve the problems using root test and ratio test.

Unit V

Diminishing and increasing the roots – Newton's and Horner's method of finding decimal roots. (In Book 2)

Outcome: Gain knowledge about concept of diminishing and increasing the roots.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOKS:

1. Sequence and Series : Arumugam and Isaac, Scitech Publication.

2. Algebra – Vol – I : T.K.Manicakavasagampillai, T.Natarajan, K.S.Ganapathy – S.Viswanathan Publications.

REFERENCE BOOK :

1. Real Analysis : Vasistha - Krishna Prakasan Media (Pvt) Ltd-Meerut.

E-Resources :

1) https://www.youtube.com/playlist?list=PLM8MBxFA-9tsueMJ6O-qM6Yavcs3Arip2

2) https://archive.nptel.ac.in/noc/courses/noc21/SEM1/noc21-ma20/

Course Designed by :
Dr.M.Azhagappan

DIFFERENTIAL EQUATIONS & ITS APPLICATIONS

Semester : II **Subject code :**

Hours/week : 5 **Total Hours/Semester : 90**

Credit : 3

Objective :

- This course aims at acquiring skills in solving differential equations
- The students apply their knowledge on differential equations to solve problems related to thermos dynamics
- To enable the students to attain skills to participate in mathematical competitions and competitive examinations

Unit I

Linear Equation with constant coefficient – Particular integral X is of the form $e^{\alpha x}$, $\cos\alpha x$ (or) $\sin\alpha x, x^m, e^{\alpha x}X$, $e^{\alpha x}\sin\beta x$, $e^{\alpha x}\cos\beta x$. (Chapter 5 - Sections 5.0)

Outcome: Understand the methods in solving the linear differential equations with constant coefficient.

Unit II

Linear equation with variable coefficients – Equations reducible to the linear homogeneous equations - Variation of parameters

(Chapter 5 - Sections 5.1 to 5.5 ,5.6 & Chapter 8 – Section 4 only)

Outcome: Understand the methods in solving the linear differential equations with variable coefficient. Know about the method of solving differential equation using variation of parameters.

Unit III

Simultaneous linear differential equations-Total differential equation – Rules for integrating $Pdx+Qdy+Rdz = 0$.

(Chapter 6- Sections 6.1 to 6.6 & chapter 11 – section 11.1.1 to 11.1.4)

Outcome: To able solve the first order and first degree order differential equations. Solve simultaneous linear equations with constant coefficient and total differential equations.

Unit IV

Partial differential equations of first order – Classification of integrals – Derivations of partial differential equations – Lagrange's method of solving – The linear equations. (Chapter 12- Sections 12.1 ,12.4)

Outcome: Solve the first order partial differential equations for some standard types.

Unit V

Laplace transform – Theorems – problems – Evaluation of integrals - Inverse Laplace transforms – Results – Problems – Solving ordinary differential equations with constant coefficients and variable coefficients and simultaneous linear differential equations using Laplace transforms. (Chapter 9- Sections 9.1 ,9.9)

Outcome: Understand the concept of Laplace transform and its application in solving differential equations. Use inverse Laplace transform to return formation funs.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK :

Differential Equations & its applications: Narayanan and T.K. Manickavasagam pillai –

S.Viswanathan Publishing Company – Chennai

REFERENCE BOOK :

Differential Equations : Arumugam & Issac – Scitech Publication – Chennai

E-Resources :

1) https://youtube.com/playlist?list=PLM8MBxFA-9tuffD2PWqjqx3WsE57rQH1h

2)
https://www.youtube.com/playlist?list=PLJ7oFAsQdm6ovDj71BSwhkfA6wL5_fD0K

3)

https://www.youtube.com/playlist?list=PLbRMhDVUMngeVrxtbBz-n8HvP8KAWBpI5

Course Designed by :

Dr.M.Azhagappan

YADAVA COLLEGE (Autonomous)

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Department of Mathematics

M.Sc., Degree course in Mathematics

CBCS (2022 – 2023)

Course Profile

Final Copy of syllabus incorporating all suggestions made in the meeting of Board of studies held on **06.08.2022**

DEPARTMENT OF MATHEMATICS
POSTGRADUATE PROGRAMME
(w.e.f. 2022 –2023)
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

DEPARTMENT OF MATHEMATICS
POSTGRADUATE PROGRAMME

(w.e.f. 2022–2023)

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

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

YADAVA COLLEGE
DEPARTMENT OF MATHEMATICS

M.Sc Mathematics (S/F)

Programme Outcomes:

- To describe concept of mathematics both in pure and applied way.
- To attain ability to spot, formulate and solve the critical problems.
- To encourage the students for passing research in mathematics and other relevant fields.
- To train problem solving skills for the students.
- To stimulate the confidence of self learning.

Programme Specific Outcomes:

- Encourage the students to do research in mathematics and other relevant field.
- To acquire knowledge of great circle in differential geometry which can be used in navigation.
- Understand the various concept of fuzzy mathematics and gain knowledge of applying them in Civil engineering, Computer engineering, Robotics, Medicine and Reliability theory.
- Motivate and help the students for competitive examinations like SET, NET etc.
- Use the mathematical knowledge for solving the real life problems.

ALGEBRA I

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 4

Objectives :

To enable the students to

- Understand the concepts in Group theory and Ring Theory
- Increase their ability to perform well in UGC-CSIR and other competitive examinations.
- Create interest to do research after their post graduation.

Unit I

A counting Principle – Normal subgroups and Quotient groups – Cayley's theorem – Permutation groups – **Homomorphisms[Self Study-Not for examinations] – Automorphisms[Self Study-Not for examinations]**.

(Sections 2.5, 2.6, 2.9, 2.10 of Chapter 2 in I.N.Herstein).

Outcome : To find the number of subgroups in a group and to learn Normal subgroups, Quotient groups, Permutation groups and its properties.

Unit II

Another Counting Principle – Sylow's theorem.

(Sections 2.11, 2.12 of Chapter 2 in I.N.Herstein).

Outcome : To know the use of Sylow's theorem in finite group and to find the number of subgroups.

Unit III

Direct products – Finite Abelian Groups.

(Sections 2.13, 2.14 of Chapter 2 in I.N.Herstein).

Outcome : To characterize the finite Abelian groups.

Unit IV

Euclidean Rings – A particular Euclidean Ring.

(Sections 3.7, 3.8 of Chapter 3 in I.N.Herstein).

Outcome : To formulate some special type of ring and to know its applications.

Unit V

Polynomial Rings - Polynomials over the Rational field – Polynomial Rings over Commutative Rings.

(Sections 3.9, 3.10, 3.11 of Chapter 3 in I.N.Herstein).

Outcome : To know the different forms of polynomial rings and to solve the irreducibility of polynomials.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book :

Topics in Algebra by I.N.Herstein, John Wiley and sons(Second Edition), 2006.

Reference Books :

1. A First Course in Abstract Algebra by John B.Fraleigh, Addison-Wesley Publishing Company.
2. Algebra by Michael Artin, Pearson Publication India(Second Edition).
3. Abstract and Modern Algebra by U.M.Swamy and A.V.S.N.Murthy, Pearson Education India.

E-Resources :

1) https://onlinecourses.nptel.ac.in/noc22_ma59/preview
2) https://onlinecourses.nptel.ac.in/noc22_ma54/preview
3) https://onlinecourses.nptel.ac.in/noc22_ma78/preview

Course Designed by :

D.Durga Prasad

Real Analysis I

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Objectives :

To enable the students to

- understand the basic concepts and to make the students familiar with importance of mathematical analysis such as convergence, continuity and differentiation
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

Unit I

The real and Complex Number Systems: Introduction-Ordered Sets – Fields - The Real Field – The Extended Real Number System – The Complex Field – Euclidean Spaces – Finite, Countable , and Uncountable Sets – Metric Spaces.(Chapter 1 full and Section 1,2 in Chapter 2)

Outcome : Demonstrate the concepts of real numbers, Euclidean spaces, countability and Metric spaces.

Unit II

Basic Topology: Compact Sets – Perfect Sets – Connected Sets.

(Section 3,4,5 in Chapter 2)

Outcome : Understand compact, perfect sets and connected sets.

Unit III

Numerical Sequences and Series: Convergent Sequences – Subsequences – Cauchy Sequences – Upper and Lower Limits – Some Special Sequences – Series. (Section 1,2,3,4,5,6 in Chapter 3)

Outcome : Able to differentiate between convergent and divergent sequence, and identify Cauchy sequence.

Unit IV

Numerical Sequences and Series: Series of Nonnegative Terms – The Number e – The Root and Ratio Tests – Power Series – Summation by Parts – Absolute Convergence – Addition and Multiplication of Series.(Section 7,8,9,10,11,12,13,in Chapter 3)

Outcome : Describe series, the set test, the ratio test, and the comparison test and apply these test to solve the problems.

Unit V

Continuity: Limits of Functions – Continuous Functions – Continuity and Compactness – Continuity and Connectedness – Discontinuities – Monotonic Functions – Infinite Limits and Limits at Infinity.(Chapter 4 full)

Outcome : Understand what is a continuous function, and can differentiate continuity and uniform continuity and use theorems to solve various problems.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book:

Principles of Mathematical Analysis: Walter Rudin, Third Edition,by McGraw –Hill book company.

REFERENCE BOOKS :

1) Methods of Real Analysis (1975) : R.R.Goldberg - Oxford and IBH Publishing House.

2) Mathematical Analysis (1977) : T.M.Apostol - Addison Wesley Publishing House.

E-Resources :

1) Mathematical Analysis By T.M Apostol

http://tinyurl.com/ztosg7h

2) https://archive.nptel.ac.in/noc/courses/noc21/SEM1/noc21-ma20/

3) https://archive.nptel.ac.in/courses/111/101/111101134/

4) https://archive.nptel.ac.in/courses/111/106/111106142/

Course Designed by :

S.Sasivika

DIFFERENTIAL EQUATIONS

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 4

Objectives :

To enable the students to

- understand the basic concepts of homogeneous equations and the partial differential equations
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

UNIT I

Introduction – Initial value problems for the homogeneous equation – Solutions of the homogeneous equation – The Wronskian and linear independence – Reduction of the order of a homogeneous equation – The non homogeneous equation.

(Section 3.1 to 3.6 of chapter 3 in Earl A.Coddington)

Outcome : Have an understanding of ordinary differential equations and solve them.

UNIT II

The Legendre equation – Introduction of linear equations with regular singular points - The Euler equation – Second order equations with regular singular points – an Example (Section 3.8 of chapter 3 & Section 4.1 to 4.3 of chapter 4 in Earl A.Coddington)

Outcome : Comprehend the Euler equations and Regular Singular points.

UNIT III

The Bessel equation - The Bessel equation (continued)- Introduction of first order equations - Equations with variables separated - Exact equations.

(Section 4.7 of chapter 4 & Section 5.1 to 5.3 of chapter 5 in Earl A.Coddington)

Outcome : Understand the Bessel equation and Exact equation.

UNIT IV

The method of successive approximations – The Lipschitz condition – Convergence of the successive approximations.

(Section 5.4 to 5.6 of chapter 5 in Earl A.Coddington)

Outcome : Understand the concept of successive approximations and Lipschitz condition.

UNIT V

Partial differential equations – Origins of first - order partial differential equations - Cauchy's problem for first - order equations – Linear equations of the first order – Integral surfaces passing through a given curve – Surface orthogonal to given system of surfaces – Non linear partial differential equations of the first order – Cauchy's method of Characteristics – Compatible systems of first order equations – Charpit's method – Special types of first order equations. (Section 2.1 to 2.11 of chapter 2 in IAN .Sneddon)

Outcome : Have an understanding towards the origin of first order partial differential equation, non linear partial differential equations and solving them using Charpit's method.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK:

1) Differential Equation :Earl A. Coddington Prentice-Hall of India Private Limited

2) Elements of Partial Differential Equations : Ian Sneddon Mc Graw-Hill

ISBN 81-203-0361-X

REFERENCE BOOK :

1) Ordinary Differential Equation : S.G.Deo,V.Raghavendra Prentice Tata McGraw-Hill

2) Partial Differential Equation : K.Sankara Rao Prentice – Hall of India

E-Resources :

1) https://archive.nptel.ac.in/courses/111/106/111106100/

2) https://archive.nptel.ac.in/courses/111/107/111107111/

Course Designed by :

Dr.V.Ba.Vijeyrani

MECHANICS

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 4

Objectives :

To enable the students to

- learn the various concepts in Mechanics
- Understand D'Alembert's Principle and Lagrange's formulation and its applications of classical mechanics and to study the central force problems.
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

UNIT I

Mechanics of a particle – Mechanics of a system of particles – Constraints - D'Alembert's principle and Lagrange's equations – Velocity - Dependent potentials and the dissipation function (Section 1.1 to 1.5 of chapter 1)

Outcome : To Understand the Lagrangian and Hamiltonian approaches in classical Mechanics.

UNIT II

Simple applications of the Lagrangian formulation – Hamilton's principle – some techniques of the calculus of variations - Derivation of Lagrange's equations from Hamilton's principle. (Section 1.6 of chapter 1 & Section 2.1 to 2.3 chapter 2)

Outcome : To understand Basic concept in variational principle.

UNIT III

Extension of Hamilton's Principle to non holonomic systems - Advantages of a variational principle formulation - Conservation theorems and symmetry properties - Reduction to the equivalent one body problem. (Section 2.4 to 2.6 of chapter 2 & Section 3.1 chapter 3)

Outcome : To understand derivations necessity and applications of Langrangian and Hamiltonian Formulations.

UNIT IV

The Equations of motion and first integrals - The equivalent one dimensional problem, and classification of orbits - The virial theorem - The differential equation for the orbit, and integrable power - Law potentials.

(Section 3.2 to 3.5 of chapter 3)

Outcome : To understand Classification of orbits and virial theorem.

UNIT V

Condition for closed orbits (Bertrand's Theorem) - The Kepler problem - Inverse square law of force - The motion in time in the Kepler problem - The Laplace –Runge-Lenz vector.

(Section 3.6 to 3.9 of chapter 3)

Outcome : To understand condition for closed orbits, Kepler problem and Inverse square law of force.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK :

1) Classical Mechanics Herbert Goldstein - second Edition, Addition Wesley /Narosa Chapter 1,2 and Chapter 3 Section 1-9 Narosa publishing House, New Delhi.ISBN 81-85015-53-8

REFERENCE BOOK:

Classical Mechanics :B.D.Gupta, Sathyaprakash Publisher Kedar Nath,Ramnath

E-Resources :

1) https://www.youtube.com/playlist?list=PLN1bN0JLYSo5yFg0HcGS_j0vuLKkfg3lM

2) https://swayam.gov.in/nd1_noc20_ph18/preview

3) https://www.pdfdrive.com/classical-mechanics-e101296882.html

Course Designed by :

C.Subha

DIFFERENTIAL GEOMETRY

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Objectives :

To enable the students to

- understand the various types of plane curves, space curves, surfaces and their properties
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

UNIT I

Introductory remarks about space curves – Definitions - Arc length - Tangent, normal and binormal - Curvature and torsion of a curve given as the intersection of two surfaces - contact between curves and surfaces.(Chapter 1 – Section 1 to 6)

Outcome : To interpret the various ideas, about space curves plane curves and surfaces.

UNIT II

Definition of a surface - Curves on a surface - Surfaces of revolution - Helicoids – metric - Direction coefficients - Families of curves. .(Chapter 2 – Section 1 to 7)

Outcome : To know about the knowledge of first fundamental forms and family of curves.

UNIT III

Geodesics - Canonical geodesic equations - Normal property of geodesic - Geodesic parallels - Geodesic curvature - Liouville's Formula. (Chapter 3 – Section 10,11,12,14,15)

Outcome : To learn about the properties of geodesies.

UNIT IV

Gauss Bonnet theorem - Gaussian curvature, surface of constant curvature, conformal mapping, Geodesic mapping - The second fundamental form - Principal curvatures - Line of curvature. (Chapter 2 – Section 16 to 20 & Chapter 3- Sections 1,2 &3)

Outcome : To discuss the concepts of Gaussian curvature and conformal mapping.

UNIT V

Developables - Developables associated with space curves – Developables associated with curves on surfaces - Minimal surfaces - Ruled surfaces. (Chapter 3 – Section 4 to 8)

Outcome : To gain knowledge about Liouville's formula for Geodesic curvature.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK:

1) An introduction to Differential Geometry T.J.Willmore Oxford University Press.

ISBN 6 -19 - 561110 -1

REFERENCE BOOKS:

1) Differential Geometry: Mittal and Agarval - Krishna Prakashan Media Pvt Ltd, Meerut.

2) Differential Geometry M.L.Khanna - Jai Prakash Nath and Co Publishers.

E-Resources :

1) Elementary Differential Geometry by Pressley by Springer.

https://www.pdfdrive.com/elementary-differential-geometry-d185499035.html

2) https://archive.nptel.ac.in/noc/courses/noc16/SEM2/noc16-ma07/

Course Designed by :

Dr.A.Muthulakshmi

Automata Theory and Formal Language

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Unit I

Why study automata theory? Introduction to formal proof, Additional forms of proof, Inductive proofs, The central concepts of Automata theory

(Chapter 1, Sections 1.1 to 1.5)

Outcome : Acquire a fundamental understanding of the central concepts of Automata Theory. Students gain the knowledge about the formal proof, Addition forms of proof and inductive proofs.

Unit II

An informal picture of finite automata, Deterministic finite automata, Non-deterministic finite automata, An application: Text search, Finite automata with epsilon transitions. (Chapter 2 Section 2.1 to 2.5)

Outcome : Students acquire knowledge to about finite automata, Deterministic finite automata and Non-Deterministic finite automata and finite automata with epsilon transitions.

Unit III

Regular expressions, Finite automata and regular expressions, Applications of regular expressions, Algebraic laws of regular expressions. (Chapter 3, Sections 3.1 to 3.4)

Outcome : Describe about Regular expressions, finite automata and regular expressions. Describe the applications of Regular expression and Algebraic laws of expression.

Unit IV

Proving languages are not regular, Closure properties of regular languages, Decision properties of regular languages, Equivalence and Minimization of automata

(Chapter 4, Sections 4.1 to 4.4)

Outcome : Proving the languages are not regular determine closure properties of regular language decision properties of regular languages. Describe the equivalent and minimization of automata.

Unit V

Context - free grammars, Parse trees, Applications of context - free grammar, Ambiguity in grammars and languages, Definition of Push Down Automata, Languages of PDA , Equivalence of PDA's and CFG's, Deterministic PDA.

(Chapter 5, Sections 5.1 to 5.4 and Chapter 6, Sections 6.1 to 6.4)

Outcome : Aquire knowledge about the concepts of context free grammar application of correct free grammar. Define pushdown Automata, language of PDA. Describe about equivalence of PDA's and CFG's and deterministic PDA.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book:

Introduction to Automata, Languages, and Computation, II Edition by J.E.Hopcroft , R.Motwani, and J.D.Ullman , Pearson Edition, 2001

Chapter 1: Sections 1.1 to 1.5, Chapter 2: Sections 2.1 to 2.5

Chapter 3: Sections 3.1 to 3.4, Chapter 4: Sections 4.1 to 4.4

Chapter 5: Sections 5.1 to 5.4, Chapter 6: Sections 6.1 to 6.4

E-Resources :

1) https://archive.nptel.ac.in/courses/106/105/106105196/

2) https://archive.nptel.ac.in/noc/courses/noc21/SEM1/noc21-cs19/

Course Designed by :

C.Subha

Modern Applied Algebra

Semester : I **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Unit I

Introduction, Binary devices and states, Finite - state machines, Covering and equivalence, Equivalence states, A minimization procedure, Turing machines, Incompletely specified machines (Chapter 3: Sections 3.1 to 3.9)

Outcome: Used to carry out the facts of Binary devices and states; and state machines, Turing machines, Incompletely Specified machines.

Unit II

Introduction, Arithmetic expressions, Identifiers: assignment statements, Arrays, For statements, Block structures in ALGOL, The ALGOL grammar, Evaluating arithmetic statements, compiling arithmetic expressions.(Chapter 4: Sections 4.1 to 4.9)

Outcome: To attain more knowledge about Arithmetic expression, identifiers, Block structures in ALGOL.

Unit III

Introduction, Order, Boolean polynomials, Block diagrams for gating networks, Connections with logic, Logical capabilities of ALGOL , Boolean applications, Boolean subalgebras, Disjunctive normal form, direct products, Morphism

(Chapter 5: Sections 5.1 to 5.10)

Outcome: To get more details about Boolean Polynomials, Boolean sub algebra and its applications.

Unit IV

Introduction, Optimization, computerizing optimization, Logic design, NAND gates and NOR gates, The minimization problem, Procedure for deriving prime implicants, Consensus taking, Flip – flops, Sequential machine design

(Chapter 6: Sections 6.1 to 6.10)

Outcome: To know more knowledge about the optimization computerizing optimization, Logic design and also it was useful to know about the NAND gates and NOT gates.

Unit V

Introduction, Encoding and decoding, Block codes, Matrix encoding techniques, Group codes, decoding tables, Hamming codes (Chapter 8: Sections 8.1 to 8.7)

Outcome: To attain more knowledge about the encoding and decoding; Block codes; matrix encoding techniques, Group codes, decoding tables, Hamming codes.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book:

Modern Applied Algebra by G.Birkhoff and T.C.Bartee, CBS Publishers and Distributors, New Delhi ,1987

Chapter 3 : Sections 3.1 to 3.9 , Chapter 4: Sections 4.1 to 4.9

Chapter 5 : Sections 5.1 to 5.10 , Chapter 6: Sections 6.1 to 6.10

Chapter 8 : Sections 8.1 to 8.7

E-Resources :

1) https://todijoceab1973.files.wordpress.com/2018/07/modern_applied_algebra.pdf

Course Designed by :

D.Durga Prasad

ALGEBRA II

Semester : II **Subject code :**

Contact hours per week : 6 **Total Hours/Semester : 90**

Credit : 5

Objectives :

To enable the students to

- Understand the concepts in Modules and Linear Transformations.
- Increase their ability to perform well in UGC - CSIR and other competitive examinations.
- Create interest to do research after their post graduation.

Unit I

Dual Spaces – Modules

(Sections 4.3, 4.5 of Chapter 4 in I.N.Herstein)

Outcome: To demonstrate Dual spaces and Modules, and to explain its properties.

Unit II

The Algebra of Linear Transformations – Characteristic Roots – Matrices.

(Sections 6.1, 6.2 and 6.3 of Chapter 6 in I.N.Herstein)

Outcome : To explain characteristic roots and the characteristic vectors, and to visualize the Linear Transformation in matrix form.

Unit III

Canonical Forms : Triangular form – Nilpotent Transformations.

(Sections 6.4, 6.5 of Chapter 6 in I.N.Herstein)

Outcome: To identify Triangular form and Nilpotent transformations and thereby able to solve problems.

Unit IV

Canonical Forms : A Decomposition of V : Jordan Form – Rational Canonical Form. (Sections 6.6, 6.7 of Chapter 6 in I.N.Herstein)

Outcome: To find the Jordan and Rational Canonical forms of Linear Transformations and thereby able to solve problems.

Unit V

Trace and Transpose – Hermitian, Unitary and Normal Transformations.

(Sections 6.8 and 6.10 of Chapter 6 in I.N.Herstein)

Outcome: To find trace and transpose of a matrix and able to know its properties. And identify Hermitian, Unitary and Normal transformations and explain their properties.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book :

Topics in Algebra by I.N.Herstein, John Wiley and sons(Second Edition), 2006.

Reference Books :

1) Linear Algebra by Kenneth Hoffman & Ray Kunze, PHI Pvt Ltd.

2) Linear Algebra – A Geometric Approach by S.Kumaresan, PHI Pvt Ltd.

3) Schaum's Outline – Linear Algebra.

E-Resources :

1) https://onlinecourses.nptel.ac.in/noc22_ma78/preview

2) https://archive.nptel.ac.in/courses/111/106/111106135/

3) https://archive.nptel.ac.in/courses/111/108/111108098/

4) https://www.youtube.com/playlist?list=PLbMVogVj5nJQnzk6Sn9o6RTpu4Evx0LOT

Course Designed by :

D.Durga Prasad

GRAPH THEORY

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

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).

Outcome: Students are able to understand the concepts of Incidence matrix, circuit matrix, Fundamental circuit matrix, cutest matrix, path matrix and its result.

UNIT II

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

Outcome: Explanation about directed groups, types of directed groups. Students gain knowledge about Euler diagraph, fundamental circuits in diagraph.

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)

Outcome: Students are able to understand the concept of numeration, types of enumeration theorems using for enumeration.

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).

Outcome: Students gain me knowledge of contact network, analysis and synthesis of contact network.

UNIT V

Transport Networks: Extension of Max-flow Mincut theorem- Minimal cost flows – The multi-commodity flow.(section 14.1-14.4)

Outcome: Students are able to apply the concept of directed graph in networking problem of operation research.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK :

Graph theory : Unit I, II, III, IV and V , 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 2nd edition, Prentice Hall of India, New Delhi.

E-Resources :

1) https://nptel.ac.in/courses/111/106/111106102/

2) https://swayam.gov.in/nd1_noc20_ma05

Course Designed by :

Dr.V.Ba.Vijeyrani

TOPOLOGY

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 4

Objectives :

To enable the students to

- understand the basic concepts and theorems in Topology
- understand and appreciate the under-link between Topology and Metric Spaces
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

UNIT I

Review of chapter 1 (**Self Study - not for examinations**) Topological Spaces – Basis for Topology - The Order topology - The Product Topology on $X \times Y$ – The Subspace topology - Closed sets and Limit points - Continuous functions – The Product topology. (Section 12,13,14,15,16,17,18,19 of chapter 2)

Outcome: Able to work easily with Basis for a topology, the order topology, the product topology andthe subspace topology.

UNIT II

Connected spaces - Connected subspace of the Real Line – Intermediate value theorem. (Section 23,24 of chapter 3)

Outcome: Increase the knowledge regarding Connectedness and its applications.

UNIT III

Compact spaces - Compact subspace of the Real Line - Extreme value theorem – The lebesgue number lemma-Uniform Continuity theorem. (Section 26,27 of chapter 3)

Outcome: Able to understand the concepts of Compactness and limit point compactness.

UNIT IV

The Countablity Axioms - The Separation Axioms - Normal spaces - The Urysohn's lemma. (Section 30,31,32,33 of chapter 4)

Outcome: Ability to acquire knowledge of Countability axioms, the Separation axioms and Normal

UNIT V

The Urysohn Metrization theorem - Tietze's Extension theorem - The Tychonoff theorem. (Section 34,35 of chapter 4 & section 37 of chapter 5)

Outcome: Understand the classical theorems such as, the Uryshon's lemma, the Tietze Extension and Tychonoff theorem.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK :

Topology (Second Edition 2000) : James R.Munkres Pearson Education, New Delhi.

ISBN 81-7758-579-7

REFERENCE BOOK :

1) Introduction to Topology and Modern Analysis : G.F. Simmons McGraw Hill books company, New Delhi.

2) Topology by K.P.Gupta, Pragathi Prakashan, Meerut, 2017.

ISBN: 9789386306944, 9386306948

3) A Text book of Topology by Dr.P.Sundaram, KEDAR NATH RAM NATH; 1st edition (1 January 2020). ISBN-10 : 9380803257, ISBN-13 : 978-9380803258

E-Resources :

1) https://archive.nptel.ac.in/courses/111/106/111106159/

2) https://www.youtube.com/watch?v=XHKcrs8YaSo&list=PLbMVogVj5nJRR7zYZifYopb52zjoScx1d

Course Designed by :

Dr.M.Azhagappan

Real Analysis II

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Objectives :

To enable the students to

- understand the basic concepts and to make the students familiar with importance of mathematical analysis such as convergence, continuity and differentiation
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

Unit I

Differentiation: The Derivative of a Real Function – Mean Value Theorems – The Continuity of Derivatives – L'Hospital's Rule – Derivatives of Higher Order – Taylor's Theorem – Differentiation of Vector-valued Functions.(Chapter 5 full).

Outcome: Understand differentiability, mean value theorems, L'Hospital's rule and solve using them.

Unit II

The Riemann-Stieltjes Integral: Definition and Existence of the Integral – Properties of the integral – Integration and Differentiation – Integration of Vector-valued Functions – Rectifiable Curves.(Chapter 6 full).

Outcome: Describe integration, differentiate, between Riemann Integral and Riemann-Stieltjes integral, and understand the properties of the integral. And understand differentiation and integration as inverse operations.

Unit III

Discussion of Main Problem – Uniform Convergence – Uniform Convergence and Continuity.(Section 1,2,3 of Chapter 7)

Outcome: Demonstrate point wise and uniform convergence of functions.

Unit IV

Uniform Convergence and Integration – Uniform Convergence and Differentiation – Equicontinuous Families of Functions – The Stone –Weierstrass Theorem.(Section 4,5,6,7 of Chapter 7)

Outcome: Understand uniform convergence and integration; uniform convergence and differentiation; and the Stone-weierstrass theorem.

Unit V

Some Special Functions: Power Series – The Exponential and Logarithmic Functions – The Trigonometric Functions – The Algebraic Completeness of the Complex Field – Fourier Series – The Gamma Function.(Chapter 8 full)

Outcome: Gain knowledge of power series, the exponential and Logrithmic functions; the Trigonometric function and its properties.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book:

Principles of Mathematical Analysis: Walter Rudin, Third Edition, McGraw-Hill book co.

REFERENCE BOOKS :

Methods of Real Analysis (1975) : R.R.Goldberg - Oxford and IBH Publishing House.

Mathematical Analysis (1977) : T.M.Apostol - Addison Wesley Publishing House.

E-Resources :

1) Mathematical Analysis By T.M Apostol

http://tinyurl.com/ztosg7h

2) https://archive.nptel.ac.in/courses/111/101/111101134/

3) https://archive.nptel.ac.in/courses/111/106/111106142/

Course Designed by :

S.Subha

OPERATION RESEARCH

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Objectives :

To enable the students to

- understand and apply some of the widely used techniques of Operations Research
- increase their ability to perform well in UGC / CSIR examinations
- create interest in going for research after their post graduation

UNIT I

Network Models :

Network definitions – Minimal spanning tree algorithm – Shortest – Route problem – Maximal flow model (Section 6.1 ,6.2,6.3 – 6.3.1,6.3.2, 6.4 -6.4.1,6.4.2 of chapter 6)

Outcome: Develop linear programming models for network, minimal spanning tree, maximal flow,

shortest route problems.

UNIT II

CPM and PERT :

Network Representation – Critical path (CPM) computations - Construction of the time schedule (Section 6.6 – 6.6.1,6.6.2,6.6.3 of chapter 6)

Outcome: Use CPM and PERT techniques, to plan, schedule, and control project activities.

UNIT III

Queuing Systems :

Why study Queues? – Elements of a queuing model - Role of exponential Distribution – Pure birth and death models – Generalized Poisson queuing model - Specialized Poisson queues-steady –State measures of performance - Single–server models - Multiple - server models - (M/M/C):(GD/∞/∞)- M/M/C): (GD/N/∞), c$\leq$n. (Section 17.1,17.2,17.3,17.4-17.4.1,17.,17.5,17.6 – 17.6.1 to 17.6.3 of chapter 17)

Outcome: Comprehend several queueing system models, such as single server models and multiserver models.

UNIT IV

Classical Optimization Theory : Unconstrained problems – Constrained problems. (Section 20.1,20.2 of chapter 20)

Outcome: Understand the ideas of classical optimization problems.

UNIT V

Nonlinear Programming Algorithms :

Unconstrained algorithms – Direct search method – Gradient method – Constrained algorithms - Separable programming – Quadratic programming – Geometric programming. (Section 21.1,21.2 – 21.2.1 to 21.2.3 of chapter 21)

Outcome: Use some solution methods for solving the nonlinear programming models.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

TEXT BOOK:

Operation Research : H.A.Taha,Vll edition - Prentice- Hall of India Private Ltd,

New Delhi. ISBN 81-7808-757-X

REFERENCE BOOK:

Introduction to Operation Reasearch : F.S.Hillier and G.J.Liebermann (1995)

McGraw Hill

E-Resources :

1) https://youtube.com/playlist?list=PLM8MBxFA-9ttx92nnqtybl7CTNGpxtlX3

2) https://archive.nptel.ac.in/noc/courses/noc17/SEM2/noc17-ma13/

Course Designed by :

D.Muthuvani

Combinatorial Mathematics

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Unit I

Introduction, the rules of sum and product, Permutations, Distribution of distinct Objects, distributions of Non- distinct objects, Generating functions and combinations Enumerators for permutations

(Chapter 1, Sections 1.1 to 1.6 and Chapter 2, Sections 2.1 to 2.3)

Outcome: To know more details about the Distribution of distinct and non-distinct objects.

Unit II

Distributions of distinct objects into non - distinct cells, Partitions of integers, Elementary relations, Linear recurrence relations with constant coefficients, Solution by the technique of generating functions

(Chapter 2, Sections 2.4, 2.5, 2.7 and Chapter 3, Sections 3.1, 3.2,3.3)

Outcome: To get vast knowledge about the linear recurrence relations with constant coefficients, and also elementary relations.

Unit III

Recurrence relations with two indices, The principle of inclusion and exclusion, The general formula Derangements, Permutations with restrictions on relative positions

(Chapter 3, Sections 3.5, Chapter 4, Sections 4.1 to 4.5)

Outcome: To know deeply about the principles of inclusion and exclusion.

Unit IV

Introduction Equivalence classes under permutation group, Equivalence classes of functions, Weights and inventories of functions, Polya's fundamental theorem, Generalization of Polya's theorem

(Chapter 5, Sections 5.1 to 5.7except 5.2)

Outcome: Used to understand clearly about the Polya's fundamental theorem and also generalization of Polya's theorem.

Unit V

Introduction, The connectedness of a graph, Eular path, Hamiltonian path

(Chapter 6, Sections 6.1 to 6.4)

Outcome: To get knowledge about the connectedness of a graph, Euler path, Hamiltonian path.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book:

Introduction to Combinatorial Mathematics by C.T.Liu, McGraw Hill, 1968

Chapter 1: Sections 1.1 to 1.6, Chapter 2: Sections except section 2.6.

Chapter 3: Sections except section 3.4, Chapter 4: Sections except sections 4.6 and 4.7

Chapter 5: Sections except section 5.2, Chapter 6: Sections 6.1 to 6.5

E-Resources :

1) https://archive.nptel.ac.in/courses/111/106/111106155/

Course Designed by :

Dr.M.Azhagappn

Visual Basic with Practicals

Semester : II **Subject code :**

Hours/week : 6 **Total Hours/Semester : 90**

Credit : 5

Unit I

Introduction, First application, Programming environment.

Outcome: Explain the basic concepts of program building block control statements.

Unit II

Intrinsic Controls, Projects in VB6, working with properties, methods, events.

Outcome: Master the basic concepts of Intrinsic controls and projects in VB.

Unit III

Data types, Constants, Variables, making statements in programs.

Outcome: Demonstrate understanding of and concept about data types, constants, and variables.

Unit IV

Conditional statements, loops, Arrays, Strings, type casting.

Outcome: Learn to use the conditional statement loops, Arrays, Strings and type casting.

Unit V

Creating menus, Dialog boxes and enhancement of programs, key board, mouse input programs, Graphics.

Outcome: To create different types of means dialog boxes and enhancement of programs and Graphics.

Pedagogy: (Teaching Methods)

Chalk and talk, PPT, Seminar and discussions.

Text Book:

1) Practical Visual Basic 6, by Bop Roselman and Richard Peasley, (QUE Publications)- Prentice Hall of India, 2000 (cheap edition)

Unit I – Chapter 1: Sections 1,2,3, Unit II - Chapter 1: Sections 4,5,6

Unit III – Chapter 2: Sections 7,8, Unit IV - Chapter 9,10,11,12

Unit V – Chapter 3: Sections 13,14,15,17.

E-Resources :

1)

https://www.youtube.com/playlist?list=PL7Vlbo56lKjx2ZEC_ANiJ-m8hiSMwmN-V

Course Designed by :

Dr.M.Azhagappan

DEPARTMENT OF MATHEMATICS

Yadava College, Madurai – 14

B.Sc., Mathematics(R & S/F) – 2022 – 2023

Semester	Title of the Subject	Status
I	**Analytical Geometry of 3D & Vector Calculus**	No change
	Calculus & Trigonometry	No change
II	**Classical Algebra**	**Change**
	Differential Equations	No change

DEPARTMENT OF MATHEMATICS

Yadava College, Madurai – 14

M.Sc., Mathematics(S/F) – 2022 – 2023

Semester	Title of the Subject	Status
I	**Algebra I**	**Change**
	Real Analysis I	No change
	Differential Equations	No change
	Mechanics	No change
	Elective I (From List I)	No change
II	**Algebra II**	**Change**
	Topology	**Change**
	Real Analysis II	No change
	Graph Theory	No Change
	Elective II (From List II)	No change