GANPAT UNIVERSITY

FACULTY OF SCIENCE

TEACHING AND EXAMINATION SCHEME

Programme	Master of Science	Branch/Spec.	Mathematics
Semester	I		
Effective from Academic Year	2021-22	Effective for the batch Admitted in	July 2021

Sr. No.	Subject Code	Subject Name	Teaching scheme												Examination scheme (Marks)					
			Credit						Hours (per week)						Theory			Practical		
			Lecture(DT)			Practical(Lab.)			Lecture(DT)			Practical(Lab.)			CE	SEE	Total	CE	SEE	Total
			L	TU	Total	P	TW	Total	L	TU	Total	P	TW	Total						
1	MMAT1CAS	Complex Analysis - I	4	1	5	--	--	--	4	1	5	-	--	--	40	60	100	--	--	--
2	MMAT1TPL	Topology	4	1	5	--	--	--	4	1	5	-	--	--	40	60	100	--	--	--
3	MMAT1ALA	Advanced Linear Algebra	4	1	5	--	--	--	4	1	5	-	--	--	40	60	100	--	--	--
4	MMAT1ODE	Ordinary Differential Equations	4	1	5	--	--	--	4	1	5	-	--	--	40	60	100	--	--	--
5	Discipline Specific Elective*		4	1	5	--	--	--	4	1	5	-	--	--	40	60	100	--	--	--
	Total		20	05	25	--	--	--	20	05	25	-	--	--	200	300	500	--	--	--

*any one subject can be offered from the following list of discipline specific elective subjects.

Discipline Specific Elective

Sr.No.	Subject Code	Subject Name
1	MSEL1FSV	Functions of Several Variables
2	MSEL1CMS	Classical Mechanics
3	MSEL1PRS	Problem Solving
4	MOOCs courses from SWAYAM PORTAL	

Program Outcomes (POs)

After completion of M.Sc. in Mathematics, students will be able to

PO-1 Apply knowledge of Mathematics, in all the fields of learning including higher research and its extensions

PO-2 Exposes students to the applications of physical and mathematical principles

PO-3 Provides a systematic understanding of the concepts and theories of mathematical and computing and their application in the real world.

PO-4 Solves critical problems by applying the Mathematical tools.

PO-5 Work as a Mathematics professional, and qualify for training as a scientific researcher.

PO-6 Enhances Logical reasoning skills, arithmetic skills, aptitude skills communication skills, self-confidence for better employability

PO-7 Participate in scientific work and independently handle business functions using learned skills

PO-8 Provide high quality and relevant education in the field of Mathematics

PO-9 Select interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and the internet

PO-10 Equipped with the axiomatic nature of mathematics, and enable themselves to work creatively within this framework

PO-11 Apply ethical principles and commit to professional ethics, responsibilities and norms of the society.

PO-12 Crack lectureship and fellowship exams approved by UGS like CSIR – NET and SET.

Program Specific Outcomes (PSOs)

PSO-1 Graduates will expand and extend their comprehension of cutting edge numerical ideas and models to improve their prosperity as mathematician and teacher.

PSO-2 To prepare the graduates for getting work in various territories, for example, Educational/Research establishments, Administrative positions, Industries, Banks, Insurance Companies since the effect of the subject concerned is extremely wide and set themselves up to break serious assessments, lectureship and fellowship tests endorsed by UGC like CSIR – NET and SET

PSO-3 To create critical thinking aptitudes for competitive tests, to upgrade thinking and systematic abilities, to create showing aptitudes by partaking in classes/meetings/workshops and to create expertise to think fundamentally on conceptual ideas of Mathematics.

PSO-4 Graduates will be able to work successfully and execute multidisciplinary research, perceive the need to take part in long lasting learning through proceeding with instruction and exploration, apply moral standards and focus on proficient morals, obligations and standards in the general.

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science	Branch/Spec.	Mathematics
Semester	I	Version	2.0.0.1
Effective from Academic Year	2021-22	Effective for the batch Admitted in	July 2021
Subject code	MMAT1CAS	Subject Name	Complex Analysis - I

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	1	--	--	5	Theory	40	60	100
Hours	4	1	--	--	5	Practical	--	--	--

Objective:

The main aim is to make students familiar with complex numbers, their properties and the study of functions of a complex variable.

Pre-requisites:

Properties of Complex numbers, Polar form of complex numbers, Complex valued functions.

Course Outcome:

COs	Description
CO1	Check differentiability and the analyticity of complex valued-function
CO2	Apply Reflection principle
CO3	Derive the criteria for the function to be constant
CO4	Evaluating contour integrals using Cauchy-Goursat theorem, Cauchy's Integral Formula and Morera's theorem
CO5	Apply Fundamental theorem of Algebra
CO6	Apply maximum modulus principle

Mapping of CO and PO/PSOs:

	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO - 10	PO - 11	PO - 12	PSO-1	PSO-2	PSO-3	PSO-4
CO1	2	1	2	2	3	1	2	3	2	3	0	2	3	3	3	3
CO2	3	2	2	2	2	2	1	3	1	2	0	1	3	3	3	3
CO3	3	2	2	2	3	1	2	3	2	3	0	2	3	1	2	3
CO4	3	3	3	3	3	2	2	3	3	3	0	2	3	2	3	3
CO5	3	2	2	2	3	2	2	3	3	3	0	2	1	1	3	2
CO6	3	3	2	2	2	1	1	3	2	3	0	2	3	3	3	1

Theory syllabus		
Unit	Content	Hrs
1	Limit, Continuity, Derivatives of functions of complex variables, Cauchy-Riemann equations, C-R equations in polar coordinates and complex form.	15
2	Analytic functions, Harmonic functions and Harmonic conjugate, Reflection Principle, Elementary functions.	15
3	Contours, Contour integrals, Anti-derivative, Cauchy-Goursat theorem, simply and multiply connected domains, Cauchy's Integral Formula, Derivatives of an analytic function, Morera's theorem, Cauchy's inequality.	15
4	Liouville's theorem, Fundamental theorem of Algebra, Gauss mean value theorem, Maximum modulus principle.	15
Reference Books		
1	"Complex Variables and Applications", J. W. Brown and R. V. Churchill, McGraw-Hill Publ. Co.	
2	"Functions of One Complex Variable", J. B. Conway, Narosa Publ. House, New Delhi.	
3	"Foundations of Complex Analysis", S. Ponnusamy, Narosa Publ. House, New Delhi.	
4	"Complex Variables: Theory and Applications", H. S. Kasana, Prentice – Hall of India.	
5	"Complex Analysis", I. Stewart and David Tall, Cambridge University Press.	
6	"The Elements of Complex Analysis", B. Choudhary, New Age International Publishers.	

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science				Branch/Spec.	Mathematics		
Semester	I				Version	2.0.0.1		
Effective from Academic Year			2021-22		Effective for the batch Admitted in			July 2021
Subject code	MMAT1TPL		Subject Name		Topology			
Teaching scheme					Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	1	--	--	5	Theory	40	60	100
Hours	4	1	--	--	5	Practical	--	--	--

Objective

The objective of this course is to give a very streamlined development of a course in metric space topology emphasizing only the most useful concepts, concrete spaces and geometric ideas, which are useful in almost all courses of mathematics.

Pre-requisites:

Fundamental concepts of set theory and logic.

Course Outcome:

COs	Description
CO1	Define topology and its construction
CO2	Construct topological spaces from metric spaces
CO3	Distinguish the nature of neighborhoods, open sets, close sets, basis and sub-basis
CO4	Identify the homeomorphic nature of topological spaces
CO5	Discuss the concepts and properties of the compact and connected topological spaces
CO6	Apply in the field of chemistry to discuss the shape of molecules by an analysis of the topology of a related graph

Mapping of CO and PO/PSOs:

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	PSO-1	PSO-2	PSO-3	PSO-4
CO1	2	2	1	1	2	2	2	3	2	2	0	2	3	3	3	3
CO2	2	1	2	2	3	2	2	2	2	3	0	2	3	3	3	3
CO3	3	2	2	2	2	3	2	3	2	2	0	3	3	1	2	3
CO4	3	2	2	3	3	2	2	3	3	3	0	3	3	2	3	3
CO5	3	1	2	2	3	3	2	3	2	3	0	3	1	1	3	2
CO6	3	2	3	3	3	2	3	2	3	3	0	1	3	3	3	2

Theory syllabus		
Unit	Content	Hrs
1	Topological spaces, Basis and sub-basis for a topology (definitions and examples only), The order topology, The product space $\prod X_i$ (for finitely many topological spaces X_i). Subspace topology, Closed sets, Limit points.	15
2	Continuous functions, Homeomorphisms, The pasting lemma, Map into products, The metric topology, The sequence lemma, Uniform limit theorem, The quotient topology.	15
3	Connected spaces, Path connected spaces, Connected sets in the real line, Components and path-components, Locally connected spaces and path connected spaces.	15
4	Compact spaces, Compact sets in the real line, Limit-point compactness, Locally compact spaces, One-point compactification.	15
Reference Books		
1	"Topology - A first course", J. R. Munkres, Prentice Hall of India.	
2	"Introduction to Topology and Modern Analysis", G. F. Simmons, McGraw-Hill Co., Tokyo.	
3	"General Topology", S. Willard, Addison Wesley, 1970.	
4	"Aspects of Topology", C. O. Christonson and W. I. Voxman, Marcel Dekker Inc.	
5	"General Topology", J. L. Kelley, D. Van Nostraml, 1950.	
6	"Topology", J. Dugundji, Prentice - Hall of India, 1975.	

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science	Branch/Spec.	Mathematics
Semester	I	Version	2.0.0.1
Effective from Academic Year	2021-22	Effective for the batch Admitted in	July 2021
Subject code	MMAT1ALA	Subject Name	Advanced Linear Algebra

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	1	--	--	5	Theory	40	60	100
Hours	4	1	--	--	5	Practical	--	--	--

Objective:

The objective of this course is to study vector space and some related applications of vectors. It also provides the basis for further studies.

Pre-requisites:

Basic properties of Vector Space and Linear Transformation

Course Outcome:

COs	Description
CO1	Solve problems related to matrices and linear equation, to follow complex logical arguments and develop modest logical arguments
CO2	Discuss the concepts of vector spaces, basis, dimension and linear transformations
CO3	Explain the fundamental concepts of advanced linear algebra and their role in modern mathematics and applied contexts
CO4	Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from advanced linear algebra
CO5	Apply problem-solving using advanced algebraic techniques applied to diverse situations in physics, engineering and other mathematical fields
CO6	Find the metrics corresponding to linear transformation and different canonical forms like triangular and Jordan canonical form etc.

Mapping of CO and PO/PSOs:

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	PSO-1	PSO-2	PSO-3	PSO-4
CO1	3	3	3	3	3	2	3	3	3	3	0	2	3	3	3	3
CO2	3	2	2	2	2	3	2	2	2	2	0	2	3	3	3	3
CO3	2	3	3	3	3	2	2	3	2	3	0	3	3	1	2	3
CO4	3	3	3	3	3	3	2	3	2	3	0	3	3	2	3	3
CO5	3	3	3	3	3	2	3	3	3	2	0	2	1	1	3	2
CO6	3	3	2	2	2	3	2	3	2	3	0	2	3	3	3	1

Theory syllabus		
Unit	Content	Hrs
1	Quick review of vector spaces, Subspaces, Linear independence and basis, Dual space.	15
2	The algebra of linear transformations, Homomorphism, Isomorphism, First isomorphism theorem, Characteristic roots, Matrices.	15
3	Canonical forms: triangular forms, Canonical forms of a Nilpotent linear transformation, Decomposition of a finite dimensional vector space: Jordan forms.	15
4	Trace and transpose, Determinants, Classification of quadrics.	15

Reference Books	
1	“Topics in algebra”, I. N. Herstein, Wiley Eastern Ltd., New Delhi.
2	“Linear Algebra: A Geometric Approach”, S. Kumaresan, Prentice Hall of India.
3	“Linear Algebra”, H. Helson, Hindustan Book Agency, TRIM-4.
4	“Linear Algebra”, J. H. Kwak, S. Hong, Birkhauser.
5	“Introduction to Topology and Modern Analysis”, G. F. Simmons, McGraw-Hill Co., Tokyo.
6	“Linear Algebra” , Ramchandra Rao, P. Bhimasankar, Tata MacGraw Hill.

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science	Branch/Spec.	Mathematics
Semester	I	Version	2.0.0.1
Effective from Academic Year	2021-22	Effective for the batch Admitted in	July 2021
Subject code	MMAT1ODE	Subject Name	Ordinary Differential Equations

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	1	--	--	5	Theory	40	60	100
Hours	4	1	--	--	5	Practical	--	--	--

Objective

The objective of this course is to continue the study of ordinary differential equations begun in B. Sc., with an emphasis on second degree equations which occur in applications.

Pre-requisites:

Fundamental concepts of set theory and logic.

Course Outcome:

COs	Description
CO1	Classify nature of point for the second-order linear differential equation
CO2	Verify the existence of solution of differential equation
CO3	Solve differential equations in terms of power series
CO4	Explain the physical phenomena in terms of differential equation
CO5	Solve some ODEs explicitly in terms of known functions and integrals
CO6	Find an approximation of problems using Picard's method

Mapping of CO and PO/PSOs:

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	PSO-1	PSO-2	PSO-3	PSO-4
CO1	2	3	3	1	3	2	2	2	2	2	0	2	3	3	3	3
CO2	2	3	3	2	3	2	3	3	3	3	0	3	3	3	3	3
CO3	3	3	3	3	3	1	3	3	2	2	0	2	3	1	2	3
CO4	2	3	3	3	3	2	3	2	3	3	0	1	3	2	3	3
CO5	3	3	3	2	3	1	2	2	3	3	0	3	1	1	3	2
CO6	3	3	3	2	3	2	2	3	2	3	0	2	3	3	3	1

Theory syllabus		
Unit	Content	Hrs
1	Classification of singularities, Series solution near an ordinary point, Frobenius method : series solution near regular singular point, Point at infinity.	15
2	Legendre equation, Legendre polynomial and its properties, Rodrigue's formula, Generating function for Legendre polynomial, Recurrence relations for $P_n(x)$.	15
3	Bessel's equation, Bessel's function of first and second kind and their properties, Generating function for Bessel's function, Recurrence relations for $J_n(x)$.	15
4	Gauss hypergeometric equation, Gauss hypergeometric function and its properties, Existence and uniqueness of solutions: the method of successive approximations, Picard's method of successive approximations, Systems of equations.	15
Reference Books		
1	"Differential equations with applications and historical notes", G. F. Simmons, McGrawHill International Editions.	
2	"Introduction to Ordinary Differential Equations", A. L. Rabenstein, Academic Press.	
3	"Advanced Differential Equations", M. D. Raisinghania, S. Chand & Co.	
4	"Higher Engineering Mathematics", B. S. Grewal and J. S. Grewal, Khanna Publ., New Delhi.	
5	"Advanced Engineering Mathematics" E. Kreyszig, Narosa Publ. House, New Delhi.	
6	"Ordinary Differential Equations: A First Course", Somasundaram, D., Narosa Publ., House, New Delhi.	

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science	Branch/Spec.	Mathematics
Semester	I	Version	2.0.0.1
Effective from Academic Year	2021-22	Effective for the batch Admitted in	July 2021
Subject code	MSEL1FSV	Subject Name	Functions of Several Variables

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	1	--	--	5	Theory	40	60	100
Hours	4	1	--	--	5	Practical	--	--	--

Objective:

This course is intended to cover differentiate function of several variable using Jacobian matrix, Properties of Tensor algebra.

Pre-requisites:

Properties of Complex numbers, Polar form of complex numbers, Complex valued functions.

Course Outcome:

COs	Description
CO1	Differentiate the function of several variables using the Jacobian matrix
CO2	Discuss the properties of Tensor Algebra
CO3	Explain the concept of Euclidian Space and its properties
CO4	Derive the expression of the elementary functions of several variables
CO5	Distinguish the concept of Partial derivative of higher-order and Directional derivatives
CO6	Apply the notion of Vector fields and forms

Mapping of CO and PO/PSOs:

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	PSO-1	PSO-2	PSO-3	PSO-4
CO1	3	3	2	3	3	2	3	3	3	2	0	3	3	3	3	3
CO2	3	3	3	2	3	2	2	2	2	3	0	1	3	3	3	3
CO3	3	2	2	2	2	1	2	2	2	2	0	2	3	1	2	3
CO4	2	2	2	2	2	2	2	3	2	3	0	2	3	2	3	3
CO5	3	3	3	2	3	1	3	3	3	2	0	3	1	1	3	2
CO6	2	2	2	2	2	2	2	2	2	3	0	2	3	3	3	1

Theory syllabus		
Unit	Content	Hrs
1	Euclidian Space R^n and its basic properties, Functions from $R^n \to R^m$, Limits and continuity, Oscillation, Relation between linear transformation $R^n \to R^m$ and $m \times n$ matrices.	15
2	Differentiations, Basic properties of differentiation, Chain rule and Jacobian matrix.	15
3	Partial derivatives and its relation with Jacobian matrix, Partial derivative of higher order, Directional derivatives and its relation with derivative, Partial derivative and continuity.	15
4	Tensor algebra on finite dimensional vector space, Alternating and symmetric tensors, Wedge product and relation among them. Vector fields and forms, their basic properties.	15

Reference Books	
1	"Calculus on Manifolds", M. Spivak, W. E. Benjamin Inc.
2	"Principles of Mathematical Analysis", W. Rudin, Tata McGraw-Hill Publ. Co., New Delhi.
3	"Functions of Several Variables", W. Fleming, Springer Verlag, New York.
4	"A course in multivariable calculus and analysis", S. R. Ghorpade and B. V. Limaye, Springer, New York.
5	"Calculus of Several Variables", Casper Goffmann, Harper and Row.
6	"Advanced Calculus", Gerald B. Folland, Pearson India Education Services Pvt. Ltd.

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science			Branch/Spec.	Mathematics		
Semester	I			Version	2.0.0.1		
Effective from Academic Year		2021-22		Effective for the batch Admitted in			July 2021
Subject code	MSEL1CMS	Subject Name		Classical Mechanics			
Teaching scheme				Examination scheme (Marks)			
(Per week)	Lecture(DT)	Practical(Lab.)	Total		CE	SEE	Total
	L TU	P TW					
Credit	4 1	-- --	5	Theory	40	60	100
Hours	4 1	-- --	5	Practical	--	--	--

Objective:

The objective of this course is to solve the mechanics problem using Lagrangian formulation and Hamiltonian formulation.

Pre-requisites:

The basic concept of Physics such as moments of inertia, length, force and time. In addition, mathematical concept of algebra, trigonometry, calculus etc.

Course Outcome:

COs	Description
CO1	Solve the mechanics problem using Lagrangian formulation and Hamiltonian formulation
CO2	Classify the constraints of Lagrangian formulation
CO3	Derive Lagrange's equation for holonomic systems
CO4	Derive Lagrange's equation from Hamilton's variational principle
CO5	Explain the concept of general conservation theorem
CO6	Derive the general equation of motion and its formal solution

Mapping of CO and PO/PSOs:

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	**PSO-1**	**PSO-2**	**PSO-3**	**PSO-4**
CO1	3	3	3	3	3	1	3	2	2	2	0	2	3	3	3	3
CO2	3	2	3	3	3	1	2	2	2	2	0	2	3	3	3	3
CO3	3	3	2	2	2	2	2	2	2	3	0	2	3	1	2	3
CO4	3	3	3	2	2	1	2	2	3	2	0	2	3	2	3	3
CO5	2	2	2	2	2	2	2	3	2	3	0	2	1	1	3	2
CO6	2	3	3	2	2	1	3	3	3	3	0	1	3	3	3	1

Theory syllabus		
Unit	Content	Hrs
1	Lagrangian formulation: D'almbert's principle, Principle of virtual work, Classification of constraints, Lagrange's equation for holonomic systems and illustrations.	15
2	Euler-Lagrange equation, Hamilton's variational principle, Derivation of Lagrange's equation from Hamilton's variational principle, Generalized momentum, Mechanics in configuration space, General conservation theorem and illustration.	15
3	Hamilton's canonical equation of motion, Relation with Lagrange's equation, Conservation theorems, Variational principle approach to Hamilton's equation of motion, Variational principle and Hamilton's equation and examples.	15
4	Canonical transformations, Generating functions, Symplectic conditions, Infintesimal canonical transformations and examples. Poisson bracket formulation, General equation of motion and its formal solution, Constants of motion, Symmetry group.	15

Reference Books	
1	“Classical Mechanics”, H. Goldstein, C. Poole and J. Safko, Pearson Education, Inc.
2	“Classical Mechanics with Introduction to Nonlinear Oscillations and Chaos”, Bhatia, Narosa Publ.
3	“Classical Mechanics”, C. R. Mondal, Prentice Hall of India Pvt. Ltd.
4	“Classical Mechanics”, Tai L. Chow, John Wiley and Sons Inc.
5	“Classical Mechanics-System of Particles and Hamiltonian Dynamics”, Walter greiner, Springer.
6	“Methods of Analytic Mechanics”, Leonard Meirovitch, Dover Publications Inc., 2007.

GANPAT UNIVERSITY

FACULTY OF SCIENCE

Programme	Master of Science	Branch/Spec.	Mathematics
Semester	I	Version	2.0.0.1
Effective from Academic Year	2021-22	Effective for the batch Admitted in	July 2021
Subject code	MSEL1PRS	Subject Name	Problem Solving

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	1	--	--	5	Theory	40	60	100
Hours	4	1	--	--	5	Practical	--	--	--

Objective:

The objective of this paper is to develop and enhance the problem solving skills of the students. The focus will be on using the theory results skillfully to solve the mathematical exercises.

Pre-requisites:

The focus will be on using the theory results skill fully to solve the mathematical exercises. The students opting for this paper are expected to have good understanding of Mathematics.

Course Outcome:

COs	Description
CO1	Apply Fundamental theorem of Algebra and maximum modulus principle
CO2	Distinguish the nature of neighborhoods, open sets, close sets, basis and sub-basis and identify the homeomorphic nature of topological spaces
CO3	Explain the fundamental concepts of advanced linear algebra and their role in modern mathematics and applied contexts
CO4	Explain the physical phenomena in terms of differential equation and solve it in terms of power series
CO5	Find an approximation of problems using Picard's method
CO6	Apply problem-solving using advanced algebraic techniques applied to diverse situations in physics, engineering and other mathematical fields

Mapping of CO and PO/PSOs:

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	PSO-1	PSO-2	PSO-3	PSO-4
CO1	2	1	2	1	1	1	2	1	0	1	0	2	3	2	2	3
CO2	2	1	2	1	2	1	3	1	0	1	0	1	1	3	3	3
CO3	2	1	2	1	1	1	1	1	0	2	0	1	3	1	2	3
CO4	3	2	2	2	2	2	2	1	0	2	0	2	3	2	3	3
CO5	3	2	2	2	2	2	3	1	0	3	0	1	1	1	3	2
CO6	3	2	2	3	2	2	3	1	0	3	0	1	3	3	3	1

Theory syllabus

Problems form topics of the syllabus of current semester which appear in recent syllabus of CSIR UGC NET exam.

References

1	Model question papers available at http://csirhrdg.res.in/csirnetmqs.htm