B. Sc (Mathematics)

(For students admitted from the academic year 2012-2013)

Curriculum 2012-2013

(Credit System)

OBJECTIVES

- To develop strong student competencies in Mathematics and its applications in a technology-rich, interactive environment.
- To develop strong student skills in the research, analysis and interpretation of complex information.
- To prepare the students to successfully complete for employment in Electronics, Manufacturing and Teaching industry.

Semester	Course Code	Course Title	L	T	P	C
I	LAT1211/LAH111/LAF1111	Tamil/Hindi/French Paper - I	3	-	-	3
	LAE1111	English Paper - I	3	-	-	3
	MAT1211	Algebra and Trigonometry	4	1	-	4
	APH1211	Allied Physics I	4	1	-	4
	APH1212	Physics Practicals - I	-	-	4	2
	PDT1211	Communication Skills	-	-	2	2
			2	-	0	2
	Total Credits					**20**
II	LAT1221/LAH1121 / LAF1121	Tamil/Hindi/French Paper - II	3	-	-	3
	LAE1121	English Paper - II	3	-	-	3
	MAT1212	Calculus and Coordinate Geometry of 3 Dimensions	4	1	-	4
	APH1213	Allied Course-Physics - II	4	1	-	4
	APH1214	Physics Practicals - II	-	-	4	2
	PDT1221	Soft Skills	-	-	2	1
	NYS1221	NGO/YOGA/NSS	-	-	2	1
		Environmental Studies	2	-	-	2
		Computer Literacy	3	-	2	4
	Total Credits					**24**

III	VAC1231	C Language	2	-	2	3
	VAE1231	Value Education	1	-	-	1
	MAT1231	Differential Equations and Laplace Transforms	4	1	-	4
	MAT1232	Probability and Statistics	4	1	-	4
	ACH1231	Allied Chemistry - I	4	-	-	4
	ACH1232	Allied Chemistry–Practicals - I	-	-	4	2
		Verbal Aptitude	2	-	-	1
	Total Credits					**19**
IV	VAC1241	Unix	2	-	2	3
	EVS1241	Environmental Studies	3	-	-	3
	MAT1241	Vector Calculus, Fourier Series and Fourier Transforms	4	1	-	4
	MAT1242	Numerical Analysis	4	1	-	4
	ACH1241	Allied Chemistry - II	3	1	-	4
	ACH1242	Allied Chemistry – Practicals - II	-	-	4	2
		Quantitative Aptitude and Logical Reasoning-I	2	-	-	2
	Total Credits					**22**
V	MAT1251	Real Analysis	4	1	-	4
	MAT1252	Algebraic Structures	4	1	-	4
	MAT1253	Operations Research	4	1	-	4
	MAT1254	Programming with C++	4	-	-	4
	MAT1255	C++ Programming Lab	-	-	4	2
	-	Core Based Elective - I	3	-	-	3
	-	Skill Based Elective - I	3	-	-	3
		Quantitative Aptitude and Logical Reasoning - II	2	-	-	2
	Total Credits					**26**
VI	MAT1261	Complex Analysis	4	1	-	4
	MAT1262	Graph Theory	4	1	-	4
	MAT1263	Mechanics	4	1	-	4

	-	Core Based Elective - II	3	-	-	3
	-	Skill Based Elective - II	3	-	-	3
	MAT1264	Mathematical Software – Practicals - Matlab	-	-	4	2
	CPW1261	Core Based Project	-	-	4	2
		Human Rights & Professional Ethics	2	-	-	2
	Total Credits					**24**

Summary

Semester	I	II	III	IV	V	VI	Total
G							
A							
V							
C							
Total Credits							**140**

TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE: 140

G - General Programme comprising of Foundation curses (English / Tamil / Hindi / Personality development / Environmental studies / Computer Literacy / Service learning Programme)

A - Allied Programme relevant to the core subject which comprises Physics and Chemistry

V - Value Added Courses

C - Core Courses corresponding to the Branch of Studies, which will include Core Courses, course based electives, skill based electives and project work.

CORE BASED ELECTIVES

Semester V

MAC1251 – Linear Algebra

MAC1252 – Financial Accounting

Semester VI

MAC1261 – Dynamics

MAC1262 – Cost Accountancy

MAC1263 – Astronomy

SKILL BASED ELECTIVES

Semester V

MAS1251 – Mathematics for Competitive Examination - I

MAS1252 – Financial Mathematics

MAS1253 – Number Theory

Semester VI

MAS1261 - Mathematics for Competitive Examination - II

MAS1262 – Combinatorics

MAS1263 - Fuzzy Mathematics

SYLLABUS

SEMESTER I

Course Code	Course Title	L	T	P	C
LAF1111	French	4	-	-	4

UNIT-I **12 hours**

A l'aéroport 'Kamaraj domestic' de Chiennai: Pronoms sujets, interrogation – **A l'université** : Articles définis et indéfinis, gens des noms, adjectifs, présent de l'indicatif : verbes réguliers en er, être, avoir, apprendre, prépositions-à, en, au, aux.

UNIT-II **12 hours**

Au café : Adjectifs interrogatifs, présent de l'indicatif: avoir, verbes en er, savoir, négations, possessifs, qui est-ce ? Qu'est-ce que c'est ? , adjectifs possessifs, négation, adjectifs irréguliers.

UNIT-III **12 hours**

A la plage : phrases au singulier et au pluriel, pronom indéfini- on, il y a, adjectifs démonstratifs, interrogatifs, négation, présent de l'indicatif : faire, voir, aller, sortir, connaitre troisième groupe verbes.

UNIT-IV **12 hours**

Un concert : présent de l'indicatif : verbes en er, venir, pouvoir, vouloir, Articles contracté avec à, chez, le futur, interrogation-est-ce que, adverbes interrogatifs- **Chez Nalli** : Adjectifs possessifs, accord de l'adjectif, Adjectifs exclamatifs, très/trop, présent de l'indicatif : acheter- regarder, Impératif.

UNIT-V **12 hours**

Nouvelles de l'Inde : Présent, verbes en -er, - ir, le futur, interrogation totale, féminin d'autres adjectifs.

REFERENCE

1. Synchronie- 1, Méthode de français, Samhita Publications, Chennai, 2007.

Course Code	Course Title	L	T	P	C
LAE1111	English	4	-	-	4

PROSE DETAILED

1. Indian crowds - Nirad C Chaudhorjuri
2. Women not the weaker sex - Mahatma Gandhi
3. The King is dead - Mary Coleridge
4. My financial career - Stephen Leacock

POETRY (DETAILED)

1. Prometheus Unbound - AD Hope
2. Urban - Nissim Ezekiel
3. There has been a death in the opposite home -Emily Dicknson
4. My grandmother House - Kamala Das

PLAY (NON DETAILED)

1. The referee
2. The Refund – Fritz Karinthy

GRAMMAR

1. Functional English :Tense, Parts of speech, active and passive voice, conditional clauses
2. Vocabulary : Synonyms and antonyms, Affixation, homonyms, one –word substitution
3. Composition : Report writing, writing advertisement, writing short messages, reading comprehension, note making

REFERENCES

1. Compilations of prose and poetry collections
2. Learners high school grammar text by Prasad Rao

Course Code	Course Name	L	T	P	C
MAT1211	Algebra and Trigonometry	4	1	0	4

INSTRUCTIONAL OBJECTIVES:

At the end of the course the students should be able to:

- Apply the concepts of matrices, in solving a system of linear equations
- Be familiar with the theory of equations
- Get exposed to the transformation of equations
- Expand trigonometric functions and also find the summation of T-series

UNIT I **12 hours**

Rank of a matrix – Consistency of a system of linear equations, Characteristic equation – Eigen values and Eigen vectors – properties – problems - Cayley – Hamilton theorem (statement only) and its applications – Diagnolisation of Matrices – problems.

UNIT II **12 hours**

Polynomial equations – Imaginary and Irrational roots – relation between roots and coefficients of equations – Symmetric functions of roots in terms of coefficients of third degree equation - problems.

UNIT III **12 hours**

Sum of the powers of the roots of an equation – Newton's Theorem on the sum of the powers of the roots – Transformation of equations – Roots with sign changed – Roots multiplied by a given number – Reciprocal equations – problems.

UNIT IV **12 hours**

Increase or decrease the roots of a given equation by a given quantity. Removal of terms - Square of the roots – Transformations in general – Descarte's rule of signs – problems.

UNIT V **12 hours**

Expansions of sinnθ, Cosnθ and Tannθ – Expansions of sinθ , cosθ and tanθ in terms of θ – Hyperbolic and inverse hyperbolic functions and their properties – Logarithm of a complex number – General principal values – problems.

TEXT BOOKS

1. T. K. Manickavasagam Pillai, Natarajan and Ganapathy, Algebra, Volume II, S.Viswanathan Pvt. Ltd., Reprint 2000.

Unit II: Chapter 6: Sec 1 – 12; **Unit III:** Chapter 6: Sec 13 – 16; **Unit IV:** Chapter 6: Sec 17 - 24

2. T. Veerarajan, Engineering Mathematics for First Year, Tata McGraw Hill Company, New Delhi, Revised Edition, 2008.
   Unit I: Chapter 1: Full (Omit quadratic forms)

3. A. Gangadharan, Engineering Mathematics, New International Pvt. Ltd., Revised Edition, 2001.
   Unit V: Chapter 2: Full

REFERENCES

1. T.K.Manickavachagam Pillai, Matrices, S.Viswanathan Printers & Publishers, reprint 2012.

2. Dr. S. Sudha, Algebra, Analytical Geometry (2D) and Trigonometry, Emerald publishers.

3. P. Duraipandian, Trigonometry, Emerald publishers, (Reprint), 2009.

4. S. Narayanan and T. K. Manickavachagam Pillai, Trigonometry, S. Viswanathan Printers & Publishers, (Reprint), 2012.

Course Code	Course Title	L	T	P	C
APH1211	Applied Physics - I	4	1	-	4

UNIT I: Simple Harmonic Motion and Circular Motion 12 hours

Time period, Amplitude, Phase, Spring mass system, Simple pendulum, Composition of two simple harmonic motions along a line and at right angles – Lissajous figures. Uniform circular motion – Acceleration of a particle in a circle, centripetal and centrifugal forces. Banking on curved roads – motion of a car around a circle.

UNIT II: Properties of Matter 12 hours

Elasticity and plasticity, elastic constants, Bending of beams – Young's modulus by non-uniform bending, Torsion in a wire – Determination of rigid modulus by torsion pendulum. Viscocity: Coefficient of viscocity – Poissuelle's formula – Comparison of viscocities – Burette method. Stoke's law – Terminal velocity. Surface tension: Molecular theory of surface tension – Excess pressure inside a drop and bubble.

UNIT III: Heat and Thermodynamics 12 hours

Kinetic theory of gases – basic postulates, ideal gas laws, Van Der Waal's equation of states, pressure of an ideal gas, RMS speed. Laws of thermodynamics – Entropy – Change of Entropy in reversible and irreversible processes. Low temperature: Joule-Kelvin effect, theory and applications – Liquefaction of gases – Linde's process – Adiabatic demagnetization.

UNIT IV: Electricity and Magnetism 12 hours

Electric charge, conservation of charge, permittivity, Coulomb's law, electric field, electric potential, Gauss' s law and its applications, conductors, dielectrics, electric current, Ohm's law. Magnetic induction, permeability, susceptibility, magnetic field due to a current carrying conductor – Biot –Savart's law – Field along the axis of a coil – force on a conductor carrying current in a magnetic field. Ampere's circuital law, Faraday's law. Gradient, Curl and Divergence. E-M waves, Maxwell's equations in free space.

UNIT V: Geometrical Optics 12 hours

Light and Optics, Fermat's principle, laws of reflection and refraction, total internal reflection and its illustrations. Mirrors and lenses, lens formula, combination of thin lenses. Refraction through a prism – combination of two prisms to produce dispersion without deviation and deviation without dispersion. Defects of images – Coma, distortion – Spherical and chromatic aberration in lenses.

REFERENCES

1. Allied physics by Dr. Dhanalakshmi & Dr. Sabesan
2. Principles of Physics by P.V.Naik
3. Physics by R. Resnick and D. Halliday
4. Physics for Technologists by Dr. D. John Thiruvadigal, Dr. S. Ponnusamy, Dr. L. Sudha and M. Krishnamohan
5. Optics by Dr. R.K. Agrawal, Rekha Jain & Dr. Garima Jain
6. Heat and Thermodynamics by M.W. Zemansky and R.H. Ditlman, adopted by Amit R. Chattopadhyay
7. Heat and Thermodynamics by J.B. Rajam
8. Elements of properties of matter by Brij Lal and Subramanian.

Course Code	Course Title	L	T	P	C
APH1212	PHYSICS PRACTICAL I	-	-	4	2

LIST OF EXPERIMENTS

1. Young's Modulus- Uniform bending Method
2. Young's Modulus- Non Uniform bending Method
3. Rigidity Modulus- Tensional oscillations method
4. Dispersive power of the prism - spectrometer
5. Cauchy's constant - spectrometer
6. Refractive index of the liquid using hollow prism – Spectrometer
7. Sonometer – A.C.Frequency
8. Potentiometer- Voltmeter calibration
9. Potentiometer- Ammeter calibration
10. Thermal conductivity measurement – Lee's disc method.

Books for a study and Reference

1. Allied Practical Physics by M.N. Srinivasan, S. Chand & Co.
2. Allied Practical Physics by M.Arul Thalapathy, compteck Publishers
3. Allied Practical Physics by Brij lal and Subramaniam

Course Code	Course Title	L	T	P	C
CLY1211	Computer Literacy	-	-	4	2

EXPERIMENTS TO IMPLEMENT

1. Study experiment on evolution of computer programming languages
2. Suggest some of the Network Topologies that can be incorporated in your campus. Justify your choice
3. Experiments to demonstrate directory creation and file creation
4. Create a document with all formatting effects
5. Create a document with tables
6. Create labels in MS word
7. Create a document to send mails using mail merge option
8. Create an Excel File to analyze the student's performance. Create a chart for the above data to depict it diagrammatically
9. Create Excel sheet to use built-in-function
10. Create Excel sheet to maintain employee information and use this data to send mails using mail merge
11. Create a Power Point presentation for your personal profile with varying animation effects with timer
12. Consider student information system which stores student personal data, mark information and non academic details

Use MS Access to create Tables and execute SQL queries to do this following:

* Display all student records
* Display student details with respect to his identity
* Delete some records from the table
* Find total marks obtained by student in each list

REFERENCE

"Introduction to Information Technology", ITL Education Solutions Ltd., Pearson 2nd Edition, 2006

Course Code	Course Title	L	T	P	C
PDT1211	Communication Skills	-	-	2	1

LISTENING SKILL

Listening comprehension and response through various modes – face to face conversations, telephone conversations, reading out written material, auto-video recorded material, mimes.

SPEAKING SKILL

Group communication – features of an effective, fluent speech through regular practice – role play, extempore – situational conversations – greetings, requests, demands, instructions and enquiries.

Informal speech, facing audience – body language – conversion of mother tongue to English language – Pitfalls in the translation of words and essential phrases to English language through short conversations.

Formal speech, paper presentation – essential aspects of business communication – Address, tone, choice of words (language), style, deciding the target audience.

READING SKILL

Reading comprehension – poems, passages (stories, essays, article, reports), conversations, short messages, e-mails, formal/informal letters – purpose – Phonemic awareness, photonics, vocabulary development, reading fluency, including oral reading skills, reading comprehension strategies.

WRITING SKILLS

Letter writing – formats and language – types – personal, business, applications, thanks, invitation, condolence, requisition, complaint – e-mail etiquette. Reports – oral reports – periodical report – progress report – field report. Essay writing – essential elements of an essay – structure – coherence – relevance.

SEMESTER II

Course Code	Course Title	L	T	P	C
LAF1211	French	4	-	-	4

UNIT I - A la gare Central Station **12 hours**

Pronoms compléments d'objet direct, présent : payer, partir, sortir, l'impératif expression du temps, construction avec infinitif – réserver des billets, demander des renseignements, donner des renseignements.

UNIT II - Un lit dans la cuisine ! **12 hours**

Verbes, ranger, mettre, impératif, il faut, devoir+infinitif, prépositions de lieu- Pierre apprend à conduire : impératif- être, avoir, savoir- pronoms compléments d'objet indirect, le passé composé avec avoir – rassurer, exprimer l'interdiction, exprimer l'autorisation, avertir.

UNIT III - Mangez-vous correctement ? **12 hours**

Expression de la quantité – Articles partitifs, adverbes, pronoms directs et indirects, pronom en, présent des verbes – manger, boire, offrir, prendre, la condition avec si – demander des informations sur les habitudes de quelqu'un, offrir à manger ou à boire, accepter, refuser, exprimer la certitude.

UNIT IV - Ils ont eu tort tous les deux ! **12 hours**

Le passé composé, adverbes, mots interrogatifs - demander son chemin, indiquer le chemin à quelqu'un, reprocher/conseiller.

UNIT V - Comment as-tu passé le week-end ? **12 hours**

Le passé composé avec être, faire du… pouvoir, vouloir – parler des activités du week-end, demander à quelqu'un de se taire.

REFERENCE

Méthode de français, SYNCHRONIE- 1, Samhita Publications, Chennai, 2007.

Course Code	Course Title	L	T	P	C
LAE1121	English	4	-	-	4

PROSE : (Detailed)

1. Examinations - Winston S Churchill
2. Travel by train - John Boynton Priestley
3. On not answering the telephone - W Plomer
4. The Reason - E V Lucas

POETRY (Detailed)

1. The Blindmen and the elephant - John Godfrey Saxe
2. Ode on a grecian urn - John Keats
3. On killing a tree - Gieve Patel
4. Strange meeting - Wilfred Owens

PLAY

1. The Sheriffs kitchen
2. The death of an anarchist by Dario de fo

GRAMMAR

1. Functional english : Agreement of subject and verb, transformation of sentence, article, preposition
2. Vocabulary : Sentence formation, british and american vocabulary, fill in the blanks, choosa the appropriate words
3. Composition : Creative writing, non-verbal task, interpreting visuals, drafting posters, writing notices

REFERENCES

1. Compilations of prose and poetry collections
2. Learners high school grammar text by Prasad rao

Course Code	Course Name	L	T	P	C
MAT1212	Calculus and Co-ordinate Geometry for Three Dimensions	4	1	0	4

INSTRUCTIONAL OBJECTIVES

At the end of the course the students should be able to:

- Solve problems using expansion of functions
- Familiar with curve tracing
- Apply integral calculus in solving problems
- Have a clear understanding of analytical geometry
- Have a thorough knowledge of conics

UNIT I **12 hours**

Expansion of functions, Maclaurin's and Taylor's theorems.

UNIT II **12 hours**

Asymptotes, curvature, Envelope, Double Point and curve tracing (polar and Cartesian)

UNIT III **12 hours**

Standard reduction formula, integration as the limit of sum, simple definite integrals. Rectification, Quadrature, Volumes and surface solids of revolution

UNIT IV **12 hours**

Equation of a line in general form, Symmetric form, Two point form, Reduction of the general equation to the symmetrical form, Straight line and the planes, Conditions of parallelism and perpendicularity of a line and a plane, Plane through a given line, Perpendicular distance formula for the line, Projection of a line on a given plane containing them, Equation of a straight line intersecting two given lines, Perpendicular distance formula for the line and coordinates of the foot of the perpendicular, Shortest distance between two lines.

UNIT V **12 hours**

Equation of a sphere- Plane section of a sphere – Tangent Plane – Equation of a cone – Right circular cone – Equation of a cylinder- Right circular cylinder.

TEXT BOOKS

1. T.K Manickavachagam Pillai and S.Narayanan, Calculus, Volume I, Vishwanathan Printer & Publishers, 2012.

   Chapter III: Sec 1.1 – 1.5; Chapter VII: Sec 1.1 – 1.4, 2 – 3; Chapter X: Sec 1.1 – 1.4, 2.1, 2.3, 2.6; Chapter XI: Sec 1 – 4 & 6, 5.1 – 5.3; Chapter XII: Sec 1, 2.1, 5 & 6; Chapter XIII: Sec 1.1 - 1.2 & 2.

2. T.K Manickavachagam Pillai and S.Narayanan, Calculus, Volume II, Vishwanathan Printer & Publishers, 2012.

   Chapter I: Sec 11, 13, 13.1 – 13.5, 15.2; Chapter II: Sec 1.2 – 1.4, 3, 4 and 5

3. T.K Manickavachagam Pillai & S.Narayanan, Analytical Geometry – Part II Three Dimensions, Vishwanathan Printer & Publishers, 2012.

   Chapter III: Sec 1 – 4, 5, 8; Chapter IV: Sec 1 – 6, 6.1; Chapter V: Sec 1 – 2.

REFERENCES

1. Dr.P.R.Vittal and V.Malini, Calculus, Margham Publishers.
2. S.G.Venkatachalapathy, Calculus, Margham Publishers.
3. Dr.P.R.Vittal an V.Malini, Co-ordinate Geometry for 3-Dimensions, Margham Publishers.

Course Code	Course Title	L	T	P	C
APH1213	Applied Physics - II	4	1	-	4

Unit I: Energy Physics **12 hours**

Sources of conventional energy – Need for non-conventional energy – Resources, Solar energy – Solar cells and its applications, Wind energy – Generation and applications, Bio mass energy – Generation and applications, Geothermal energy - Generation and applications, Tidal energy - Generation and applications, Hydro energy - Generation and applications.

Unit II: Modern Physics **12 hours**

Atomic structure, Alpha, beta and gamma radiation, Law of radioactive decay, decay constant, half life, mean life, nuclear energy – mass defect – Binding energy, fission and fusion, Biological effects of radiation. Black body radiation, Plank's quantum hypothesis, Photoelectric effect, Compton effect, De-Broglie equation, uncertainty principle.

Unit III: Optics **12 hours**

Wave nature of light: Huygens's principle, interference – Young's double slit experiment, coherence, interference from thin films, Michelson's interferometer. Newton's rings. Diffraction: wave theory of light, single slit experiment, diffraction grating, Polarization. Fiber optics, propagation of light in optical fiber, acceptance angle, numerical aperture, attenuation, types of optical fibers and its applications.

Unit IV: Crystal Physics **12 hours**

Space lattice – basis, Unit cell, Lattice parameters, Bravis lattices and Crystal systems, Cubic crystal system, Crystal symmetry, Density & Atomic packing fraction, Directions, planes and Miller indices, inter-planar distance, NaCl, Zinc sulphide, HCP structure.

Unit V: Electronics **12 hours**

Basic electronics: P and N – type semiconductors, Junction diode and their characteristics, half wave and full wave rectifiers, voltage regulations – Zener diode. Junction transistor – PNP and NPN, their characteristics – Common base – common emitter mode, single stage simplifier. Digital electronics: AND, OR, NOT gates, NAND and NOR as universal building blocks. Boolean algebra, elementary ideas of integrated circuits (ICs) – fabrication of integrated circuits by monolithic technology – advantages and limitations of integrated circuits. Elementary ideas of ICs – SSI, MSI, LSI and VLSI.

REFERENCES

1. A text book of Allied physics by A.K. Jha, I.K. International publishing house pvt.
2. Applied Physics, Volume 2 by Mansi Karkare and Rajni Bahuguna, I.K. International publishing house pvt.
3. Text book of Optics by Brijlal and Subramanian, S. Chand Limited.
4. Renewable energy sources: Their Impact on Global Warming and Pollution by Tasneem Abbasi, Abbasi S.A., PHI Learning Pvt. Ltd.
5. Introduction to Fiber Optics by K. Thyagarajan and Ajay Ghatak, Cambridge, University Press.
6. Basic electronics, 6th edition by B. Grob, McGraw Hill, NY, 1989.
7. Modern Physics by R. Murugeshan, S.Chand & Co.
8. Introduction to Solid State Physics by C. Kittel, 5th edition, Wiley Eastern Ltd.

Course Code	Course Title	L	T	P	C
APH1214	PHYSICS PRACTICAL II	-	-	4	2

LIST OF EXPERIMENTS

1. Air wedge – Thickness of the wire
2. P.O.Box – Specific resistance
3. Dielectric constant measurement
4. Hall effect – Hall coefficient determination
5. Quinke's method – Determination of magnetic susceptibility
6. Study of attenuation and propagation characteristics – optical fiber
7. Zener diode – Characteristics
8. Construction of AND, OR, NOT gates – Using diodes and transistors
9. NAND gate as a Universal gate.
10. Study of regulation properties and characteristics – Using IC

Books for a study and Reference

1. Allied Practical Physics by M.N. Srinivasan, S. Chand & Co.
2. Allied Practical Physics by M.Arul Thalapathy, compteck Publishers
3. Allied Practical Physics by Brij lal and Subramaniam

Course Code	Course Title	L	T	P	C
PDT1221	Soft Skills	-	-	2	1

- Self analysis
- Attitude – perceptions – positive approach to challenges
- Challenge management – ideas & approach
- Goal setting
- Time management – planning
- Entrepreneurial skills – leadership skills
- People management – team work, leadership
- Decision making – problem identification
- Interview skills – getting familiar with one's CV – presentation and performance giving and receiving feedback, setting expectations and exhibiting professional behavior.

Semester III

Course Code	Course Title	L	T	P	C
VAC1231	C Language	2	-	2	3

UNIT I - CONSTANTS, VARIABLES AND DATA TYPES 9 hours

Introduction, Characters set, C Tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of variables, Declaration of storage class, Declaring variable as a constant, Declaring a variable as volatile.

UNIT II - OPERATORS AND EXPRESSIONS 9 hours

Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operators, Bitwise operators and Special operators.

UNIT III - DECISION MAKING AND BRANCHING 9 hours

Decision making with IF Statement, Simple IF statement, the IF...ELSE Statement, The Switch statement, GOTO Statement, Break and Continue statement, While and Do..While statement, For Statemen-Functions, Pointers And Structure-Definition of functions, Recursion, Passing arrays to functions, Pointers to functions, Pointers and structures.

UNIT IV-DEVELOPMENT OF ALGORITHM, FLOW – CHART AND PROGRAM 9hours

Solving quadratic equations - Finding factorial using recursion - To add/ subtract/ multiply two matrices (3×3). Sorting a set of numbers in ascending/descending order To arrange the names in the alphabetical order.
Computing Fibonacci numbers - Printing Large Block Letters

UNIT V - ADVANCED PROGRAMS 9 hours

Numerical integration by Trapezoidal/Simpson's rule - Determination of roots by Newton – Raphson method-Solution of differential equation by Runga Kutta II order method - Matrix inversion (n×n)
Sorting an array of integers with Bubble Sort

REFERENCE BOOKS

1. E.Balagurusamy, Programming in ANSI C, 4th Edition, TATA McGraw- Hill Publication 2008
2. Dr.S.S.Srivastava, Programming In C Language (With ANSI Features), Lakshmi Publications 2008
3. Brian Kernighan and Dennis Ritchie, The C Programming Language, Prentice Hall 1998

Course Code	Course Title	L	T	P	C
VAE1231	Value Education	1	-	-	1

UNIT I 3 hours

Value Education-Introduction – Definition of values-Why values? –Need for Inculcation of values –Object of Value Education-Sources of Value – Types

- Values
- Personal values
- Social values
- Professional values
- Moral and spiritual values
- Behavioral (common) values

UNIT II **3 hours**

Personal values- definition of person - Self confidence – Self discipline – Self Assessment – Self restraint – Self motivation – Determination – Ambition – Contentment – Humility and Simplicity– Sympathy and Compassion – Gratitude – Forgiveness – Honesty – Courtesy.

UNIT III **3 hours**

Social values – Definition of Society – Units of Society – Individual, family, different groups– Community – Social consciousness – Equality and Brotherhood – Dialogue – Tolerance– Responsibility – Co-operation Freedom – Repentance and Magnanimity.

UNIT IV **3 hours**

Professional values – Definition – Competence – Confidence – Devotion to duty – Efficiency– Accountability – Respect for learning / learned – Willingness to learn- Open and balanced mind– Team spirit – Professional Ethic – Willingness for Discussion – Aims – Effort – Avoidance of Procrastination and slothfulness – Alertness.

UNIT V **3 hours**

Behavioral values – individual values and group values – Good manners at home and outside– Equality – purity of thought, speech and action – Understanding the role of religion – Faith– Understanding the commonness of religions – respect for other faiths – unity diversity – Living together – Tolerance – Non-violence – Truthfulness – Common aim – Unified efforts towards peace – Patriotism.

REFERENCES

1. Dr. S. Ignacimuthu S.J., Values for life, Better yourself Books, 1999
2. Values (Collection of Essays), Sri Ramakrishna Math, 1996
3. Prof.R.P.Dhokalia., Eternal Human Values NCRT-Campus, Sri Aurobindo Marg
4. Dr.G.Pope, Tirukural English Translation
5. The Bible
6. The Kuran
7. The Bagavath Geetha

Course Code	Course Name	L	T	P	C
MAT1231	**Differential Equations and Laplace Transforms**	**4**	**1**	**0**	**4**

INSTRUCTIONAL OBJECTIVES

At the end of the course the students should be able to

- Solve first order and of higher degree differential equations
- Solve second order differential equations
- Form PDEs by different methods
- Solve differential equations of Lagrange's type and also by the method of multipliers
- Be thorough with applications of Laplace transform, particularly solving differential equations.

UNIT I **12 hours**

First order but of higher degree equations - solvable for p, solvable for x, solvable for y, Clairaut's form - simple problems.

UNIT II **12 hours**

Second order differential equations with constant coefficients; Second order differential equations with variable coefficients ; method of variation of parameters - simple problems.

UNIT III **12 hours**

Formation of P.D.E by eliminating arbitrary constants and arbitrary functions; Complete Integral; Singular Integral; General Integral; the standard types f(p,q) = 0, f(x,p,q) = 0, f(y,p,q) = 0, f(z,p,q) = 0, f(x,p) = f(y,q); Clairaut's form ; Equation reducible to standard types - simple problems; Charpit's method.

UNIT IV **12 hours**

Lagrange's Equation Pp + Qq = R; Method of multipliers; Homogeneous linear differential equation - solutions - simple problems.

UNIT V **12 hours**

Laplace Transform; Inverse Laplace Transform (usual types); Convolution theorem; Applications of Laplace Transform to solution of first and second order linear differential equations (constant coefficients) and simultaneous linear differential equations - simple problems.

TEXT BOOK

1. P. Kandasamy, K. Thilagavathy, Mathematics for B. Sc Branch – I, Volume 3, 1st Edition, S. Chand and Co.Ltd., New Delhi, 2004

Unit I: Chapter 1: Ordinary Differential Equations ; **Unit II:** Chapter 2, 4 & 5;

Unit III: Chapter 1: Sec 1.1 – 1.14; **Unit IV:** Chapter 1: Sec 1.15 – 1.16; **Unit V:** Chapter 1: Laplace Transform

REFERENCES

1. M. K. Venkataraman and S. Krishnan, Engineering Mathematics, The National Publishing Co., 2010.

2. Dipak Chatterjee, Integral Calculus and differential equations, TATA McGraw S Hill Publishing Company Ltd., 2000.

3. Narayanan, T.K. Manichavasagam Pillai, Calculus, Vol. I, S. Viswanathan Printers Pvt. Limited, 2007.

4. Dr. S. Sudha, Differential Equations & Integral Transforms, Emerald Publishers, 2002.

MAT1232	Probability and Statistics	4	1	0	4

INSTRUCTIONAL OBJECTIVES

At the end of the course the students should be able to

- Be thorough with two dimensional random variables and the Transformation of Random variables
- Be familiar with basic probability concepts and probability distributions
- Be exposed to the testing of hypotheses of both small and large samples
- Be familiar with correlation and regression analysis
- Understand fully the characteristics of control charts and their applications

UNIT I **12 hours**

Probability theory - Random variables - Moments- Moment generating functions- Binomial, Poisson, Geometric, Exponential, Normal distributions.

UNIT II **12 hours**

Two Dimensional Random variables-Marginal & Conditional Distributions- Transformation of Random variables - Central limit theorem - simple problems.

UNIT III **12 hours**

Introduction-large sample test based on normal distribution - Test for single mean- difference between means, proportion, difference between proportion - small sample test based on t, F distributions - Test for single mean, difference between means, standard deviation, difference between standard deviations - Chi square test for goodness of fit, independence of attributes.

UNIT IV **12 hours**

Pearson's correlation co-efficient - Spearman's Rank correlation co-efficient, Regression – concepts - Regression lines - Analysis of Variance - One way and Two way classification.

UNIT V **12 hours**

Introduction - Process control - control charts for variables-X and R, X and S charts, control charts for attributes: P chart, nP chart, C chart and their applications in process control.

TEXT BOOKS

1. Veerarajan, "Probability, Statistics and Random process", Tata McGraw Hill, 1st reprint, 2004

   Unit I: Chapter 1: Sec 1.1 – 1.25, Chapter 2: Sec 2.1 – 2.20, Chapter 3: Sec 3.1 – 3.2, Chapter 4: Sec 4.63; **Unit II:** Chapter 2: Sec 2.23 – 2.26, Chapter 3: Sec 4.72 – 4.78; **Unit III:** Chapter 9: Sec 9.1 – 9.51; **Unit IV:** Chapter 4: Sec 4.17 – 4.47, Chapter 10: Sec 10.1 – 10.25

2. S. P. Gupta, "Statistical Methods", Sultan Chand Publication, 35th edition, New Delhi, 2007.

   Unit V: Chapter 7

REFERENCES

1. S.C Gupta & V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11th edition, Sultan chand & sons, reprint, 2007.

2. Johnson R.A, "Miller & Freund's Probability and Statistics for Engineer's", 6th edition, Pearson Education, Delhi, 2006.

3. Dr. P. R. Vittal, "Mathematical Statistics", Margham Publications, Chennai, 2013.

Course Code	Course Title	L	T	P	C
ACH1231	Allied Course Chemistry I	4	-	-	4

Unit I - Nomenclature and Isomerism 12 hours

Nomenclature of straight chain and closed ring compounds-mono and poly-functional organic compounds. Hybridisation - sp, sp2 and sp3. Bond length, bond angle, dipole moment, inductive effect, mesomeric effect and hyperconjucation.

Solubility - protonic and aprotic solvents. Isomerismgeometrical; and optical isomerism, optical activity,asymmetry, dissymmetry, elements of symmetry, R, S notations. Reactive intermediates- carbocation, carbanion and free radicals generation, structure and stability).

Unit II - Hydrocarbons 12 hours

General methods of preparation of alkanes, properties- mechanism of free radical halogention of alkanes, conformation analysis of ethane, n- butane and cyclohexane. Methods of preparation of alkenes-stereochemistry of dehydrohalogenation (E1, E2, E1CB mechanism). Properties of alkenes electrophilic and nucleophilic addition mechanisms.

Unit III-Chemistry of Hydrogen, Halogen, Silicon and metals 12 hours

Occurrence, extraction and chemical properties of iron, cobalt, nickel and copper. Electrochemical theory of rusting. Position of hydrogen in periodic table, atomic hydrogen and isotopes of hydrogen. Preparation and structure of borozole, SiO2, SiC and SiCl4. General characteristics of halogens-interhalogens.

Unit IV - Chemical Kinetics 12 hours

Rate of reaction, order, molecularity, first order rate law and simple problems, half life period of first order equation, pseudo first order reaction, zero and second order reactions. Arrhenius and collision theories assumption,derivation, demerits-experimental determination of order of reactions.

UNIT V - Photochemistry 12 hours

Difference between photochemical reactions and dark reactions. Laws of photochemistry-Einstein law of photochemical equivalence, quantumyield. Kinetics of Hydrogen-chlorine, Hydrogen-bromine and decomposition of HI.Fluorescence, phosphorescence and chemiluminescence.

REFERENCES

1. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry, (23rd edition), New Delhi, Shoban Lal Nagin Chand & Co.,1993.
2. Bahl B.S. and Arun Bahl, Organic Chemistry, (12th edition), New Delhi, Sultan Chand & Co., (1997).
3. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry, (23rd edition) New Delhi, Shoban Lal, Nagin Chand & Co.,(1993).

Course Code	Course Title	L	T	P	C
ACH1232	Allied Chemistry Practical's I	-	-	4	2

LIST OF EXPERIMENTS:

1. Estimation of HCl (Std. oxalic acid x NaOH x HCl)
2. Estimation of NaOH (Std. Na_2CO_3 x HCl x NaOH)
3. Estimation of oxalic acid (Std. FAS x $KMnO_4$ x oxalic acid)
4. Estimation of FAS (Std. oxalic acid x $KMnO_4$ x FAS)
5. Estimation of $KMnO_4$ (Std. $K_2Cr_2O_7$ x FAS x $KMnO_4$)
6. Estimation of ascorbic acid (iodimetry)
7. Estimation of phenol / aniline (iodimetry)
8. Estimation of copper (iodimetry)

REFERENCES

1. J.N. Gurtu and Kapoor, Experimental Chemistry, S. Chand and Co.1987.
2. N.S. Gnanapragasam and G. Ramamurthy, Organic Chemistry – Lab Manual, S. Viswanathan & Co. Pvt. Ltd., 1998.

SEMESTER IV

Course Code	Course Title	L	T	P	C
VAC1241	**Unix**	**2**	**-**	**2**	**3**

Unit I – INTRODUCTION **9 hours**

File and common commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - the grep family - Other filters - the stream editor sed - the awk pattern scanning and processing language - files and good filters.

Unit II - CONCEPTS OF SHELL 9 hours

Command line structure - Metacharacters - Creating new commands - Command arguments and parameters - program output as arguments - Shell variables - More on I/O redirection - loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.

Unit III - SHELL PROGRAMMING 9 hours

Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.

Unit IV - FEATURES IN UNIX 9 hours

Standard input and output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - pick - Interactive file comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts.

Unit V-PROGRAM DEVELOPMENT AND DOCUMENT PREPARATION 9 hours

Program development - Four function calculator - Variables and error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures - Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.

REFERENCES

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India, 1984.

2. Steven Earhart - The UNIX System for MSDOS Users - Galgotia book source P. Ltd, 1990

Course Code	Course Title	L	T	P	C
EVS1241	Environmental Studies	3	-	-	3

UNIT I - ENVIRONMENT AND ECOSYSTEMS **9 hours**

Environmental education: definition - scope - objectives and importance. Concept of an ecosystem - types (terrestrial and aquatic ecosystems) - structure and function - ecological succession - food chains, food webs and ecological pyramids

UNIT II - BIODIVERSITY **9 hours**

Introduction: definition - genetic, species and ecosystem diversity - value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - threats to biodiversity: habitat loss, poaching of wildlife - endangered and endemic species of India, Conservation of biodiversity: in-situ and ex-situ conservations.

UNIT III - POLLUTION AND WASTE MANAGEMENT **9 hours**

Air and water pollution - classification of pollutants and their effects - control measures of air pollution. Waste water treatment (general) - primary, secondary & tertiary stages. Solid waste management: causes - effects of municipal waste, hazardous waste, bio medical waste - process of waste management.

UNIT IV - CURRENT ENVIRONMENTAL ISSUES **9 hours**

Environmental ethics - issues and possible solutions - population explosion, climatic change, ozone layer depletion, global warming, acid rain and green house effect. Sustainable development: definition, objectives and environmental dimensions of sustainable development - environmental audit for sustainable development.

UNIT V - ENVIRONMENTAL PROTECTION **9 hours**

National and international concern for environment: Important environmental protection acts in India -water, air (prevention and control of pollution) act, wild life conservation and forest act - functions of central and state pollution control boards - international effort - key initiatives of Rio declaration, Vienna convention, Kyoto protocol and Johannesburg summit.

REFERENCES

1. Sharma.B.K. and Kaur, Environmental Chemistry, Goel Publishing House, Meerut, 1994
2. De.A.K., Environmental Chemistry, New Age International (p) lt., , New Delhi, 1996
3. Kurian Joseph & R. Nagendran, Essential of Environmental Studies, Pearson Education, 2004.

Course Code	Course Name	L	T	P	C
MAT1241	**Vector Calculus, Fourier Series and Fourier Transforms**	**4**	**1**	**0**	**4**

INSTRUCTIONAL OBJECTIVES

At the end of the course the students should be able to

- Familiar with physical interpretation of divergence and curl of a vector
- Be exposed to evaluating line, surface and volume integrals
- Be thorough with the study of Fourier series expansions
- Be familiar with half range Fourier series and harmonic analysis
- Be thorough with properties and theorems on Fourier transforms with applications

Unit I **12 hours**

Gradient, Divergence of a scalar point function and curl of a vector point function directional derivative, unit normal to a surface, Solenoidal and irrational vectors – physical interpretation of divergence and curl of a vector point function.

Unit II **12 hours**

Line surface and volume integrals; theorems of Gauss, Stokes and Greens (with proof) - simple problems.

Unit III **12 hours**

Fourier series- definition - Fourier Series expansion of periodic functions with Period 2π and period $2l$ – Use of odd & even functions in Fourier Series.

Unit IV **12 hours**

Half-range Fourier Series – definition- Development in Cosine series & in Sine series Change of interval.

Unit V **12 hours**

Dirichlet's conditions, Fourier integral formula (with proof),Fourier transform, Inverse Theorem for Fourier transform, Fourier sine and cosine transforms and their inversion formulae. Linearity property of Fourier transforms, Change of scale property, Shifting theorem, Modulation theorem, Convolution theorem of Fourier transforms, Parseval's identity.

TEXT BOOKS

1. S.Narayanan and T.K.Manickavachagam Pillai, Vector algebra and Analysis, S.Viswanathan Pvt. Ltd., 1995
   Unit I: Chapter 4: Sec 6 – 12; **Unit II:** Chapter 6: Sec 2 – 5.1

2. S.Narayanan and T.K.Manickavachagam Pillai, Calculus, Volume III, Vijay Nicole Imprints Pvt. Ltd., Chennai, 2004
   Unit III & IV: Chapter 6: Sec 1, 2, 3 and 5

3. A.R.Vasistha and R.K.Gupta, Integral Transforms, Krishna Prakashan Media Pvt. Ltd., New Delhi, 2011.
   Unit V: Chapter 6: Sec 6.1 – 6.13.

REFERENCE

1. S. Narayanan, R. Hanumantha and T. K. Manickavachagam Pillai, Ancillary Mathematics, Volume I & II, S.Viswanathan Printers, Chennai, 2007.

Course Code	Course Name	L	T	P	C
MAT1242	Numerical Analysis	4	1	0	4

INSTRUCTIONAL OBJECTIVES:

At the end of the course the students should be able to

- Solve equations numerically by direct and iterative methods
- Be familiar with interpolation and numerical differentiation & integration
- Be exposed to best approximations and spline approximations
- Solve equations using predictor – corrector methods
- Be thorough with elliptic, parabolic and hyperbolic equations

UNIT I **12 hours**

Direct Method: Gauss elimination method – Error Analysis– Iterative methods: Gauss-Jacobi and Gauss-Seidel – Convergence considerations – Eigen value Problem: Power method.

UNIT II **12 hours**

Interpolation: Lagrange's and Newton's interpolation -- Errors in interpolation – Optimal points for interpolation - Numerical differentiation by finite differences – Numerical Integration: Trapezoidal, Simpson's and Gaussian quadratures – Error in quadratures.

UNIT III **12 hours**

Norms of functions – Best Approximations: Least squares polynomial approximation – Approximation with Chebyshev polynomials – Piecewise Linear & Cubic Spline approximation.

UNIT IV **12 hours**

Single-Step methods: Euler's method –Taylor series method – Runge-Kutta method of fourth order – Multistep methods: Adams-Bashforth and Milne's methods – Stability considerations – Linear Two point BVPs: Finite Difference method.

UNIT V **12 hours**

Elliptic equations: Five point finite difference formula in rectangular region – truncation error; One-dimensional Parabolic equation: Explicit and Crank-Nicholson schemes; Stability of the above schemes - One-dimensional Hyperbolic equation: Explicit scheme.

TEXT BOOKS

1. Kandasamy P, Thilagavathy. K and G. Gunawathy, Numerical Methods, S.Chand & Sons, 3rd Revised Edition, 2013.

   Unit I: Chapter 4: Sec 4.2.1, 4.7, 4.8, 4.9, Chapter 13: Sec 13.1; **Unit II:** Chapter 6: Sec 6.2, 6.3, 6.4, Chapter 8: Sec 8.7, Chapter 9: Sec 9.2, 9.3, 9.8, 9.9, 9.10; **Unit IV:** Chapter 11: Sec 11.5, 11.9, 11.12, 11.17, 11.18; **Unit V:** Chapter 12: Sec 12.5, 12.9, 12.10

2. Balagurusamy. E, Numerical Methods, Tata Mcgraw Hill Publishing Company, 3rd Edition, 2000.

   Unit I: Chapter 14: Sec 14.6; **Unit III:** Chapter 9: Sec 9.2, 9.3, 9.8, 9.9, Chapter 10: Sec 10.4; **Unit IV:** Chapter 13: Sec 13.9, Chapter 14: Sec 14.3.

REFERENCES

1. Isaacson E. and Keller, H.B., "Analysis of Numerical Methods" Dover Publication, 1994.
2. Philips G.M and Taylor P.J., "Theory and Applications of Numerical Analysis", Academic Press, 1996.
3. Jain M.K, "Numerical Methods for Scientific and Engineering computation", 3rd Edition, New Age International, 1999.
4. Conte S.D. and Carl de Boor, "Elementary Numerical Analysis", 3rd Edition, Tata McGraw-Hill Publishing Company. 2004.
5. Atkinson K.E., "An Introduction to Numerical Analysis", Wiley & Sons, 2nd Edition, 1989.
6. Brian Bradie., "A Friendly Introduction to Numerical Analysis", 1st Edition, Pearson Education, New Delhi, 2007.

Course Code	Course Title	L	T	P	C
ACH1241	ALLIED CHEMISTRY II	4	-	-	4

UNIT I - Carbohydrates, Benzene and Heterocyclic compounds 12 hours

Classification of carbohydrates –Properties and uses of glucose and fructose-mutarotation, interconversion of glucose and fructose. Amino acids- preparation

and properties of glycine and alanine. Proteins - peptide linkage primary,secondary and ternary structure of proteins. Chemistry of benzenepreparation, mechanism of electrophillic substitution reactions. Heterocyclic compounds– Preparation and properties of pyrrole and pyridine

UNIT II - Coordination Chemistry 12 hours

Nomenclature and isomerism of coordination compounds. EAN rule, VB and Crystal field theories of octahedral, tetrahedral and square planar complexes. Chelation and its industrial applications. Magnetic studies - magnetic susceptibility, ferromagnetism and anti ferromagnetism.

UNIT III - Industrial Chemistry 12 hours

Silicones-preparation, properties and uses. Glass -manufacture and types. Cement-composition, manufacture and setting of cement. Ceramics composition, types and preparation. Noble gases- hydrides, clathrates, compounds of xenon. Solutions-concentration of solutions (normality, molality and molarity).

UNIT IV - Phase Rule 12 hours

Phase rule- phase diagram of H2O, CO2, S, Pb-Ag and Zn-Mg systems. Adsorption - Langmuir and Frendluich adsorption isotherms. Applications of adsorption, principles of chromatography (Paper, TLC and column).

UNIT V - Electrochemistry 12 hours

Faradays laws of electrolysis, specific conductance, equivalent conductance, cell constant. Arrhenius theory, Oswald's dilution law and Kohlrausch law. Conduct metric titrations. Debye- Huckel theory of strong electrolytes (assumption only). Solubility product. Nernst equation applications of EMF measurements.

REFERENCES

1. Puri B.R., Sharma L.R., Kalia K.K., Principles of Inorganic Chemistry, 23rd edition, Shoban Lal Nagin Chand & Co,1993
2. Bahl B.S. and Arun Bahl, Advanced Organic Chemistry, 12th Edition, Sultan Chand & Co., 1997.
3. Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry, Shoban Lal, Nagin Chand & Co., 1993.

Course Code	Course Title	L	T	P	C
ACH1242	ALLIED CHEMISTRY PRACTICALS II	-	-	4	2

LIST OF EXPERIMENTS

1. Estimation of zinc (EDTA titration)
2. Estimation of magnesium (EDTA titration)
3. Estimation of hardness of water (EDTA titration)
4. Identification of acidic, basic, phenolic and neutral organic substances
5. Test for aliphatic and aromatic nature
6. Test for saturation and unsaturation
7. Detection of N, S and halogens.

REFERENCES

1. J.N. Gurtu and Kapoor, Experimental Chemistry, S. Chand and Co. 1987.
2. N.S. Gnanapragasam and G. Ramamurthy, Organic Chemistry – Lab Manual, S. Viswanathan & Co. Pvt. Ltd., 1998.

Course Code	Course Name	L	T	P	C
MAT1251	**Real Analysis**	**4**	**1**	**0**	**4**

INSTRUCTIONAL OBJECTIVES:

At the end of the course the students should be able to

- Be thorough with real and complex fields
- Be familiar with metric spaces

- Understand thoroughly the convergence of the sequences and series
- Get exposed to the limits of functions and in detail, derivatives of higher order theorems

UNIT I **12 hours**

Introduction- ordered sets-fields-real field-the extended real number system-the complex field-Euclidean spaces.

UNIT II **12 hours**

Finite, countable and uncountable sets-metric spaces-compact sets-perfect sets-connected sets.

UNIT III **12 hours**

Convergent sequences - subsequences - Cauchy sequences-upper and lower limits-some special sequences and series - series of non-negative terms - the root and ratio tests-absolute convergence.

UNIT IV **12 hours**

Limits of functions – Continuous functions – Continuity and – Continuity and Connectedness – Monotonic Functions

UNIT V **12 hours**

The Derivate of a Real Function – Mean Value Theorems – Continuity of Derivatives – L'Hospital's Rule- Derivatives of Higher Order – Taylor's Theorem – Differentiation of Vector – Valued Functions.

TEXT BOOK

Walter Rudin, "Principles of Mathematical Analysis", 3rd Edition, McGraw–Hill International Editions, Singapore, Reprint 2012.

Unit I: Chapter 1: 1 – 23; **Unit II:** Chapter 2: 24 – 46; **Unit III:** Chapter 3: 47 – 63, 65 – 69, 71 – 72; **Unit IV:** Chapter 4: 83 – 93, 95 – 97; **Unit V:** Chapter 5: 103 – 119.

REFERENCES

1. Tom M. Apostol, Mathematical Analysis, 2nd edition, Pearson, Narosa Publishing House, New Delhi, 2002.
2. Richard R. Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Co, Pvt. Ltd., New Delhi, 2010.
3. Sterling K.Berberian, A first course in Real Analysis, 4th Edition, Springer India Pvt. Ltd., 2009.

Course Code	Course Name	L	T	P	C
MAT1252	**Algebraic Structures**	**4**	**1**	**0**	**4**

INSTRUCTIONAL OBJECTIVES:

At the end of the course the students should be able to

- Be familiar with group theory
- Be thorough with subgroups and quotient groups
- Study the characteristics of the rings and fields

- Study further aspects of quotient rings and fields
- Be exposed to basic concepts of bases

UNIT I **12 hours**

Definition of a group – some examples of groups – Some preliminary lemmas - Subgroups – A counting principle - Cosets and Lagrange's theorem.

UNIT II **12 hours**

Normal subgroups and Quotient groups - Homomorphism - Automorphism.

UNIT III **12 hours**

Definition and example of rings – Some special classes of rings - Homomorphisms - Ideals and quotient rings.

UNIT IV **12 hours**

More Ideals and quotient rings – The field of quotients of an integral domain.

UNIT V **12 hours**

Elementary basic concepts - Linear independence and bases

TEXT BOOK

I. N. Herstein, Topics in Algebra, John Wiley & Sons., 2nd Edition, Reprint 2007.

Unit I: Chapter 2: Sec 2.1 – 2.5; **Unit II:** Chapter 2: Sec 2.6 - 2.8; **Unit III:** Chapter 3: Sec 3.1 3.4;

Unit IV: Chapter 3: Sec 3.5 – 3.6; **Unit V:** Chapter 4: Sec 4.1 – 4.2.

REFERENCES

1. S. Arumugam and A. Thangapandi Issac, Modern algebra, New Gamma Publishing House, 2013.
2. T. K. Manicavachagam Pillai, T. Natarajan, & K. S. Ganapathy, Algebra, Vol. I, S. Viswanathan Pvt. Limited, 2012.

Course Code	Course Name	L	T	P	C
MAT1253	**Operations Research**	**4**	**1**	**0**	**4**

INSTRUCTIONAL OBJECTIVES

At the end of the course the students should be able to

- Solve LPP using different techniques
- Be familiar with the formulation of different types of problems
- Be exposed to queueing theory

- Be familiar with game theory
- Study PERT – CPM calculations

UNIT I **12 hours**

Linear Programming Formulation and Graphical Method – Simplex Method – Artificial Variable Techniques – Big-M Method

UNIT II **12 hours**

Mathematical Formulation of an Assignment Problem – Assignment Algorithm - Unbalanced Assignment Models – Travelling Salesman Problems – Duality – Dual Simplex Method.

UNIT III **12 hours**

Queueing Theory – Introduction – Queueing system – Characteristics of Queueing system – symbols and Notation – Classifications of queues – Problems in (M/M/1): (∞/FIFO); (M/M/1): (N/FIFO); (M/M/C): (∞/FIFO); (M/M/C): (N/FIFO) Models.

UNIT IV **12 hours**

Game Theory – Two person zero sum game – The Maxmini – Minimax principle – problems - Solution of 2 x 2 rectangular Games – Domination Property – (2 x n) and (m x 2) - graphical method – Problems – Replacement Problems

UNIT V **12 hours**

Network scheduling by PERT / CPM – Introduction – Network and basic components – Rules of Network construction – Time calculation in Networks – CPM. PERT – PERT calculations – Cost Analysis – Crashing the Network – Problems.

TEXT BOOKS

1. Prem Kumar Gupta D. S. Hira, Operations Research, 5th Edition, S. Chand & Company Ltd., Ram Nagar, New Delhi, 1998.

   Unit I: Chapter 2: Page No. 46-51, 107-115, 155-177; **Unit II:** Chapter 4: Page No. 329-357; **Unit III:** Chapter 10: Page No. 906-930

2. Kandiswarup, P. K. Gupta, Man Mohan, Operations Research, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition, 2004.

   Unit IV: Chapter 17: Page No. 313-338; **Unit V:** Chapter 20: Page No. 459-480

REFERENCES

1. Prof.V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan, Resource Management Techniques, A.R.Publications, 2012.

2. S.Dharani Venkata Krishnan, Operations Research Principles and Problems, Keerthi Publishing House PVT Ltd., 2005.

Course Code	Course Name	L	T	P	C
MAT1254	**Programming with C++**	**4**	**-**	**-**	**4**

INSTRUCTIONAL OBJECTIVES

On successful completion of the course the students should have

- Learnt class structure, member functions & data members.
- Learnt the concept of inheritance, types and example problems.
- Learnt the concepts of polymorphism, types and problems.

- Learnt the concepts of File handling.

UNIT I **12 hours**

Evolution of C++ - applications of C++ - structure of C++ program. Tokens – keywords –identifiers and constants – basic data types – user-defined data types – constant pointers and pointers to constants – symbolic constants –type compatibility – declaration of variables –dynamic initialization of variables – reference variables – operators in C++ - scope resolution operator – memory management operators – manipulators – type cast operator – expressions and their types – special assignment expressions – implicit conversions – operator precedence.

UNIT II **12 hours**

Functions in C++: The main function – function prototyping – call by reference – return by reference – inline functions – default arguments – const arguments – function overloading. Managing Console I/O Operations: C++ streams – C++ stream classes – unformatted console I/O operations – formatted console I/O operations –managing output with manipulators.

UNIT III **12 hours**

Classes and Objects: Specifying a class – defining member functions – making an outside function inline – nesting of member functions – private member functions – arrays within a class – memory allocation for objects –arrays of objects – objects as function arguments – friend functions – returning objects – const member functions. Constructors and Destructors: Introduction – constructors – parameterized constructors –multiple constructors in a class – constructors with default arguments – copy constructor.

UNIT IV **12 hours**

Operator Overloading: Introduction – defining operator overloading – overloading unary operators – overloading binary operators - overloading binary operators using friends – rules for overloading operators. Inheritance: Introduction – defining derived classes – single inheritance – making a private member inheritable – multilevel inheritance – multiple inheritance – hierarchical inheritance – hybrid inheritance.

UNIT V **12 hours**

Working with Files: Introduction – Classes for File Stream Operations - Opening and Closing a File – Detecting End-of-file – More about open( ): File Modes – File Pointers and their Manipulations – Sequential Input and Output Operations – Updating a File: Random Access.

TEXT BOOKS

1. E.Balagurusamy, Object Oriented programming with C++, McGraw Hill, 2008.
2. Robert Lafore, Object oriented programming in Turbo C++, Galgotia publications Pvt.Ltd, New Delhi, 2002.
3. Bjarne Stroutstrup,The C++ programming language, II Edition, Addision Wesley, 2013.

REFERENCES

1. D. Ravi Chandran, Programming with C++, Tata McGraw-Hill publishing company limited, New Delhi, (Reprint), 2013.
2. Ashok N. Kamthane, Object Oriented Programming with ANSI and Turbo C++, Pearson Education publishers, (2003).
3. John R.Hubbard, Programming with C++, 2nd Edition, TMH publishers, (2002).

Course Code	Course Title	L	T	P	C
MAT1255	C++ Programming Lab	-	-	4	2

INSTRUCTIONAL OBJECTIVES

This computer lab course aims to provide strong logical thinking and error-free syntax codes writing, to master the debugging techniques and to present the results in neat form in C++ Language.

LIST OF EXPERIMENTS

1. Write a C++ program to print the following output using **for** loop
   1
   22
   333
   4444
   ……
   ……..

2. Write a C++ program to evaluate the following function to 0.0001% accuracy.
   a) sin(x)
   b) cos(x)
   c) exp(-x)

3. Write a C++ program to find roots of a quadratic equation.

4. Write a C++ program to sort the array of numbers.

5. Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write a Member function ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.

6. Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.

7. Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the Operator —+ to Concatenate two Strings, —= = to Compare two strings.

8. Write a C++ Program to create structure, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

9. Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area () and Calculate_Perimeter () to calculate area

and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.

10. Write a C++ Program to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum, product of the above two matrices.

11. Write a C++ Program to check whether the given string is a palindrome (with & without Pointers).

12. Write a C++ program to illustrate hybrid inheritance.

13. Write a C++ Program to create a File and to display the contents of that file with line numbers.

Course Code	Course Name	L	T	P	C
MAT1261	Complex Analysis	4	1	0	4

INSTRUCTIONAL OBJECTIVES

At the end of the course the students should be able to

- Grasp several facts on complex integration
- Get exposed to the harmonic functions and its properties
- Have sound knowledge in the derivatives of analytic functions
- Be familiar with singularities of different types and the corresponding theorems
- Be thorough with the evaluation of integrals of different types

UNIT I **12 hours**

Complex Numbers - Point at Infinity- Stereographic Projection - Analytic functions: Definitions of Function of a Complex Variable- Mappings- Limits, Continuity - Derivatives and Differentiation Formula - Cauchy-Riemann Equations - Properties of Analytic Functions - Necessary and Sufficient Conditions for Analytic Functions - Harmonic Functions - Determination of Harmonic Conjugate and Analytic Function.

UNIT II **12 hours**

Mappings Conformal Mapping - The transformations w = az+b, w = 1/z, w = z2, w $= \sqrt{z}$, $w = e^z$, Bilinear Transformation and special Bilinear Transformation.

UNIT III **12 hours**

Integrals Contours - Line Integrals-Cauchy- Goursat's Theorem (without proof) Cauchy's Integral Formula - Derivatives of Analytic Functions - Maximum Modulus Theorem.

UNIT IV **12 hours**

Power series - Taylor's and Laurent's Theorem - Singularities and Classification - Problems

UNIT V **12 hours**

Cauchy's Residue theorem – Evaluation of integrals of the following types – $\int_0^{2\pi} f(\cos\theta, \sin\theta)\,d\theta$, $\int_{-\infty}^{\infty} f(x)\sin ax\,dx$, $\int_{-\infty}^{\infty} f(x)\cos ax\,dx, a > 0$, $\int_{-\infty}^{\infty} \frac{p(x)}{q(x)}dx$, $\int_{-\infty}^{\infty} f(x)\,dx$, where f(z) has finite number of poles on the real axes – Jordan's lemma.

TEXT BOOK

1. S. Narayanan and T. K. Manicavachagam Pillay, Complex Analysis, Revised Edition, S. Viswanathan Printers & Publishers, 2002.

Unit I: Chapter 1: Sec 1 - 5, 8; **Unit II:** Chapter 2: Sec 1 - 3; **Unit III:** Chapter 3: Sec 1 - 12; **Unit IV:** Chapter 4: Sec 1 - 4; **Unit V:** Chapter 5: Sec 1 - 6

REFERENCES

1. P.Duraipandian and Laxmi Duraipandian, Complex Analysis, Emerald Publishers, Chennai, 1999.
2. S.Ponnusamy, Foundations of Complex Analysis, Narosa Publishing House, New Delhi. 2000.
3. Murray R. Spiegel, Theory and Problems of Complex Variable, Tata-McGraw Hill Edition, New Delhi. 2005.

Course Code	Course Name	L	T	P	C
MAT1262	**Graph Theory**	**4**	**1**	**0**	**4**

INSTRUCTIONAL OBJECTIVES:

- To introduce the students to the beautiful and elegant theory of graphs.

- To equip the students with problem solving, critical thinking and algorithm techniques that may be used to solve a host of very practical real-world problems.
- To study and develop the concepts of graphs, subgraphs, trees connectivity, Eulerian and Hamiltonian graphs, matching colorings of graphs and planar graphs

UNIT I **12 hours**

Graphs, subgraphs, Degree of a vertex, Isomorphism of graphs, independent sets and coverings; intersection graphs

UNIT II **12 hours**

Adjacency and incidence of matrices; Operations on graphs; degree sequences; graphic sequences; Walks; trails; paths; problems

UNIT III **12 hours**

Connectedness and components; cut point, bridge, block; Connectivity theorems and simple problems

UNIT IV **12 hours**

Eulerian graphs and Hamiltonian graphs; simple problems; Trees, theorems, and simple problems

UNIT V **12 hours**

Planarity; definition and properties; Characterisation of planar graph, Colour ability; chromatic number and index

TEXT BOOK

1. S. Arumugam and S. Ramachandran, "Invitation to Graph Theory", SITECH Publications India Pvt. Ltd, Chennai – 17, 2006.
   Chapters: 2 (omit 2.5), 3, 4, 5, 6, 8 (omit 8.3) and 9 (9.1 only).

REFERENCE BOOKS

1. S.Kumaravelu, Susheela Kumaravelu, Graph Theory, SKV Publishers, Sivakasi, 1999.
2. S.A.Choudham, A First Course in Graph Theory, Macmillan India Ltd, 2000.
3. Robin J. Wilson, Introduction to Graph Theory, Prentice Hall, 2012.
4. J.A.Bondy and U.S.R. Murthy, Graph Theory with Applications, Macmillon, London, 2008.

Course Code	Course Name	L	T	P	C
MAT1263	Mechanics	4	1	0	4

INSTRUCTIONAL OBJECTIVES:

At the end of the course the students should be able to

- Understand in detail, simple harmonic motion
- Be familiar with the characteristic of elasticity
- Study, in detail, motion of a projectile
- Be familiar with central forces and orbit
- Be thorough with motion of a rigid body

UNIT I **12 hours**

Rectilinear motion: Simple harmonic motion – Composition of two simple harmonic motions – Motion under gravity in a resisting medium – Resistance varying as the velocity and as the square of the velocity.

UNIT II **12 hours**

Impact: Definition of impulsive forces and impulse – Principle of conservation of linear momentum – Elasticity – Collision of two smooth spheres – change in kinetic energy and impulse imparted due to collision – Impact of a smooth sphere on a fixed smooth plane.

UNIT III **12 hours**

Motion of a projectile: Motion of a projectile, nature of a trajectory – Range on a horizontal plane – Range on an inclined plane – Moment of inertia of simple bodies – Perpendicular and parallel axis theorems (Statement only)

UNIT IV **12 hours**

Central orbit: Central forces and central orbit – Orbit as a plane curve – Differential equation of the central orbit in polar co-ordinates – Given a central orbit, to find the law of force and the speed of any point – to obtain the nature of the orbit when the central force is M/r^2 and M/r only.

UNIT V **12 hours**

Motion of a rigid body: Two dimensional motion of a rigid body – motion about a fixed axis – Kinetic energy – Moment of momentum – Moment of the effective forces about the fixed axis.

TEXT BOOK

1. P. Durai Pandian, Mechanics, S. Chand & Company Ltd., 2012.
   Unit I: Chapter 5 : 5.1, 5.3, 5.6, 5.7; Unit II: Chapter 12 : 12.1 – 12.7; Unit III: Chapter 13: 13.1 – 13.8; Unit IV: Chapter 15: 15.1 – 15.5; Unit V: Chapter 17: 17.1 – 17.3.

REFERENCES

1. A.V. Dharmapadam, Mechanics, S. Viswanathan and Co., 2011.
2. M. K. Venkatraman, Statics, National Publishing co., 2012
3. K. V Nailk and M. S. Kasi, Statics, Emerald publishing co.

Course Code	Course Title	L	T	P	C
MAC1251	Linear Algebra	4	-	-	4

UNIT I **12 hours**

Vector Spaces – Definition – Simple properties – Examples – Homomorphism – Sub space – Quotient spaces – Internal direct sum – External direct sum.(Section 4.1).

Unit II **12 hours**

Linear Independence – Dimension of a Vector space – Bases - Dimension of Quotient spaces (Section 4.2).

UNIT III **12 hours**

Inner product spaces – Definition – Examples – Applications – Orthogonal complement of a sub space – Orthonormal & Orthonormal Basis - Gram Schmidt Orthogonalization process (Section 4.4).

UNIT IV **12 hours**

Linear Transformation – The Algebra of linear transformations – Characteristic roots – Matrices – Canonical forms – Triangular forms(section 6.1 - 6.4)

UNIT V **12 hours**

Nilpotent Transformations – Definitions – Lemma – Theorems Trace and Transpose – Definition – Properties – Theorems.

TEXT BOOK

1. I.N. Herstein, Topics in Algebra, 2nd Edition, John Wiely, NewYork, 2013.

REFERENCES

1. A.R.Vasistha, A first course in modern algebra Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP).
2. Viswanatha Naik, Modern Algebra, Emerald Publishers, Anna Salai, Chennai, 2001
3. Dr.R.Balakrishnan and Dr.N.Ramabadran, A Text Book of Modern Algebra, Vikas Publishing Limited, NewDelhi,

Course Code	Course Title	L	T	P	C
MAC1252	**FINANCIAL ACCOUNTING**	**4**	**-**	**-**	**4**

UNIT I **12 hours**

Branch Accounts – Dependent Branches – Stock and Debtors System. Departmental Accounts – Basis of allocation of Expenses – Inter departmental Transfers.

UNIT II **12 hours**

Single Entry System – Statement of affairs – Conversion Method.

UNIT III **12 hours**

Hire Purchase System – Hire Purchase Trading Account – Installment System.

UNIT IV **12 hours**

Partnership Accounts I – Admission – Retirement – Death of a Partner.

UNIT V **12 hours**

Partnership Accounts II - Dissolution – Insolency of a partner and all partners – Rule in Garner Vs Murray.

Text Books

1. R.L.Guptha and V.K.Guptha, Financial Accounting, Sultan Chand and Sons, New Delhi, 2008.

2. S.P.Jain and Narang, Financial Accounting, Kalyani Publishers, Ludhiana, 2002.

Reference Books

1. Reddy and Murthy, Financial Accounting, Margham Publications, Chennai – 17.
2. Dr.S.Ganesan and Kalavathi, S.R.Elangovan, Financial Accounting, Tirumalai Publication, Nagercoil.
3. Narayanaswamy, Financial Accounting, PHI Learning A Managerial Perspective,3rd Edition, Private Limited, New Delhi.
4. Mukherjee & Hanif, Financial Accounting, McGraw Hill Companies, UP.

Course Code	Course Title	L	T	P	C
MAC1261	DYNAMICS	4	-	-	4

INSTRUCTIONAL OBJECTIVES

This course aims to provide models for some real life problems. This covers topics like Simple Harmonic Motion, Projectiles, Central Orbits and Moment of Inertia. Stress is on the mathematical formulation of the physics aspects of the problems and it develops logical deduction and interpretation.

UNIT I **12 hours**

Velocity, Relative Velocity, Angular Velocity, Acceleration, Rectilinear motion, rectilinear motion with constant acceleration, Relative angular velocity, Work, Power, Energy.

UNIT II **12 hours**

Motion of a projectile, Nature of a trajectory, Results pertaining to the motion of a projectile, Range on an inclined plane, Maximum range on the inclined plane. Simple problems.

UNIT III **12 hours**

Impulsive force, Conservation of linear momentum, Impact of a sphere, Laws of impact, Impact of two smooth spheres, Direct impact of two smooth spheres, Direct impact of a smooth sphere on a plane, oblique impact of a smooth sphere on a plane. Simple problems.

UNIT IV **12 hours**

Central force and Central Orbit, Equation of central orbit, finding law of force and speed for a given orbit, Determination of the orbit when law of force is given, Kepler's Laws on planetary motion. Simple Problems.

UNIT V **12 hours**

Moment of Inertia of simple bodies, Thoerems of parallel and perpendicular axes, Moment of inertia of triangular lamina, circular lamina, circular ring, right circular cone, sphere. Simple problems.

TEXT BOOK

P. Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasam, Mechanics, 6th Edition, S. Chand and Company Ltd, 2005.
Chapter 2, 3, 4, 5, 6, 9 (Omit 5.2.1, 6.2.4, 6.3)

REFERENCES

1. S. Narayanan, R. Hanumantha Rao, K. Sitaraman, P. Kandaswamy, Statics, S. Chand and Company Ltd, New Delhi.
2. S. L. Loney, An Elementary Treatise on Statics, Cambridge University Press, 1951
3. V. Dharmapadam(1991) Mechanics. S. Viswanathan Printers & Publishers. Chennai.
4. M.K. Venkataraman (1990) Statics. A Rajhans Publications. (16th Edn), Meerut.
5. Joseph F. Shelley (2005) Vector Mechanics for Engineers Vol-I: Statics, Tata McGraw Hill Edition, New Delhi.

Course Code	Course Title	L	T	P	C
MAC1262	COST ACCOUNTANCY	4	-	-	4

UNIT I **12 hours**

Cost Accounting – Meaning, Scope, objectives - advantages and limitations – Difference between cost accounting and financial accounting – Elements of cost – preparation of cost sheet.

UNIT II **12 hours**

Material Management – Purchase procedure – Various stock levels – Economic order quantity – Bin card and stores ledger – Pricing of issues – FIFO, LIFO, Simple Average and weighted average methods.

UNIT III **12 hours**

Labour cost – Importance – Various methods of labour cost control – methods of wage payment – various incentive schemes – labour turnover.

UNIT IV **12 hours**

Overheads – Classification – apportionment of overheads – redistribution of overheads – absorption of overheads – calculation of machine hour rate.

UNIT V **12 hours**

Process costing – normal loss - abnormal loss and abnormal gain – Joint product and by products.

TEXT BOOKS

1. Jain & Narang, Cost Acounting, Kalyani Publishers Ludhiana, 2006.

2. Reddy & Hari Prasad Reddy, Cost Accounting, Margham Publications, Chennai-17.

REFERENCES

1. Maheswari, Cost Accounting, Sultan chand & sons, New Delhi, 2002.

2. Pillai & Bagavathi, Cost Accounting, Sultan Chand & sons, New Delhi.

3. Jawaharlal, Cost Accounting, The McGraw Hill Companies, UP, 2007.

Course Code	Course Title	L	T	P	C
MAC1263	ASTRONOMY	4	-	-	4

Objectives

This course aims to provide working knowledge about the universe.

UNIT I **12 hours**

Celestial Sphere - Diurnal motion - Simple Problems page 39 - 83 (Use the results 65, 67, 83, 84) to solve problems. (No derivation.)

UNIT II **12 hours**

Zones of Earth - Terrestrial Latitudes and Longitudes - Rotation of Earth - Dip of the horizon - Simple problems. Page 90-131 (Use the results of 96, 99, 102) to solve problems. No need for derivation.

UNIT III **12 hours**

Twilight-simple problems-Astronomical refraction - Simple problems. page 131-157. (Use the result of 124,125,126,127 to solve problems. No need to derive the result)

UNIT IV **12 hours**

Kepler's Laws - simple problems page 172-189. (Use result s of 159,160 to solve the problems.No need to derive the results.

UNIT V **12 hours**

Moon - phases of moon - Eclipses - Introduction – umb ra and penumbra - lunar eclipse - solar eclipse - condition for the occurrence of lunar and solar eclipses. Page 334-377.

(Use the results of 270,271,272 to solve problem, no need to derive the results)

TEXT BOOK

S. Kumaravelu and Susheela Kumaravelu, Astronomy. SKV Publishers, Nagarkoil, 2004.

Course Code	Course Title	L	T	P	C
MAC1264	DISCRETE MATHEMATICS	4	-	-	4

Objectives

- To understand Logic and mathematical reasoning and to count /enumerate objects in a systematic way. To understand Mathematical induction and recursion.

- To understand Set theory, relations and functions and to Read, understand and construct mathematical arguments.
- To understand Recurrence Relation, Generating functions.
- To understand Boolean algebra and its application to switching theory.

UNIT I

Propositions and Logical operators - Truth tables and propositions generated by a set - Equivalence and Implication - Tautologies - Laws of logic - Proofs in Propositional calculus - Direct proofs - Conditional conclusions - Indirect proofs - The existential and universal quantifiers - Predicate calculus including theory of inference.

(**12 Hours)**

UNIT II

Mathematical Induction - Functions – Combinatorics - Pigeonhole Principle – Generalized Pigeon hole principle

UNIT III

Laws of Set theory - Partition of a set - The duality principle - Relations – Properties - Equivalence relation and partial order relation-poset-Graphs of relations - Hasse diagram - Matrices of relations - Closure operations on relations - Warshall's algorithm - (**12 Hours)**

UNIT IV

Recurrence relations - Solving a recurrence relation – Homogeneous and Non-homogeneous Recurrence relations - Formation of Recurrence relations obtained from solutions - Generating functions - Solution of a recurrence relation using generating functions (**12 Hours)**

UNIT V

Boolean algebra - Application of Boolean Algebra to switching theory. (**12 Hours)**

TEXT BOOKS:

1. Alan Doerr and Kenneth Levasseur, "Applied Discrete Structures for Computer Science", Galgotia Publications (P) Ltd, 1992.
2. Tremblay J. P. and Manohar R., Discrete Mathematical Structures with applications to Computer Science, Tata Mc Graw Hill Publishing Co., 35th edition,2008.

REFERENCES:

1. V. Sundaresan, K.S. Ganapathy Subramanian and K. Ganesan, Discrete Mathematics, New Revised Edition, A. R. Publications, 2001
2. Kolman and Busby, Discrete Mathematical Structures for Computer Science, Prentice Hall, 3rd edition,1997.

3. Kenneth H.Rosen, Discrete Mathematics and its Application, Fifth edition, Tata McGraw-Hill Publishing company PVT .Ltd., New Delhi, 2003
4. Lipschutz Seymour, Marc Lars Lipson, Discrete Mathematics, Mc Graw Hill Inc., 1992
5. Narsing Deo, Graph Theory with applications to Engineering and Computer science, Prentice-Hall of India pvt. Ltd., New Delhi, 1987
6. C.L. Liu, Elements of Discrete Mathematics, 2nd Edition, McGraw Hill Publications, 1985.

Course Code	Course Title	L	T	P	C
MAS1251	Mathematics for Competitive Examination-I	4	-	-	4

Unit I **12 hours**

Numbers, H.C.F. and L.C.M. of numbers, Decimal Fractions.

Unit II **12 hours**

Simplification, Square roots and Cube Roots, Average.

Unit III **12 hours**

Problems on numbers, problems on Ages.

Unit IV **12 hours**

Surds and Indices, Percentage, Profit and Loss.

Unit V **12 hours**

Ratio and Proportion, Partership.

TEXT BOOK

1. R.S.Aggarwal, Quantitative Aptitude for competitive Examination, S.Chand and Company Ltd, 152, Annasalai,Chennai, 2012

Course Code	Course Title	L	T	P	C
MAS1252	Financial Mathematics	4	-	-	4

UNIT I **12 hours**

Probability – Probabilities and Events – Conditional probability – Random Variables and Expected Values – Convergence and correlation – Continuous Random variables

–Normal Random Variables – Properties of Normal Random Variables – The central limit Theorem – Simple Problems.

UNIT II **12 hours**

Geometric Brownian Motion – G.B.M. as a limit of simple models – Brownian Motion – Simple problems - Interest rates – Present value analysis – Rate of return – Continution of varying interest rates – An example of option pricing – other examples of pricing via arbitrage.

UNIT III **12 hours**

The Arbitage theorem – The multi period Binomial model – proof of the Arbitrage theorem - Black Scholes formula – properties of the Black Scholes option cost – Derivation of Black Scholes formula – simple problems.

UNIT IV **12 hours**

Additional results on options – Call options on Dividend paying Securities – Pricing American put options – Adding Jumps to Geometric Brownian Motion – Estimating the Volatility Parameter – Simple problems .

UNIT V **12 hours**

Valuing by Expected Utility – Limitation of Arbitrage pricing – valuing Investments by Expected utility – The portfolio selection problem – Value at risk and conditional value at risk The capital assets pricing model – Mean variance analysis of risk – Neutral priced Call options – Rates of return – Single period and Geometric Brownian Motion – simple problems.

TEXT BOOK

Sheldon .M.Ross, An Elementary Introduction to Mathematical Finance, 2nd Edition, Cambridge University press, 2005

REFERENCES

1. S.M.Ross, A first course in probability, Englewood cliffs Prentice Hall-NJ, 2002
2. J.Cox and M.Rubinstein, Options Market, Englewood cliffs Prentice Hall-NJ, 2012
3. J.E.Ingersill, Theory of financial decision making, Lanjarn, MD Rowerman of Little fields, 1987.

Course Code	Course Title	L	T	P	C
MAS1253	Number theory	4	-	-	4

UNIT I **12 hours**

The Division Algorithm – The g.c.d. – The Euclidean Algorithm – The Diophantine Equation ax + by = c.

UNIT II **12 hours**

The Fundamental theorem of arithmetic , The sieve of Eratesthenes – The Goldbach conjecture – basic properties of congruence.

UNIT III **12 hours**

Special Divisibility tests – Linear congruences – The Little Fermat's theorem – Wilson's theorm.

UNIT IV **12 hours**

The functions rando – The Mobius inversion formula – The greatest integer function.

UNIT V **12 hours**

Euler's Phi – function – Euler's theorem – Some properties of the Phi – function.

TEXT BOOK

David M. Burton, Elementary Number Theory, Universal Book Stall, 2001

REFERENCE

Kumaravelu and Suseela Kumaravelu, Number Theory, S.Kumaravelu, Muruga Bhavanam, Chidambara Nagar, Nagarkoil-2, 2002

Course Code	Course Title	L	T	P	C

MAS1261	Mathematics for Competitive Examination - II	4	-	-	4

UNIT I **12 hours**

Chain rule –Time and work.

UNIT II **12 hours**

Time and Distance .

UNIT III **12 hours**

Problems on Trains.

UNIT IV **12 hours**

Boats and Streams.

UNIT V **12 hours**

Alligation or Mixture.

TEXT BOOK

R.S.Aggarwal, Quantitative Aptitude For Competitative Examinations, S.Chand and co Ltd,152,Annasalai,Chennai, 2001

Course Code	Course Title	L	T	P	C

MAS1262	Combinatorics	4	-	-	4

UNIT I **12 hours**

Introduction to Basic ideas – General formula for f(n,k) – Recurrence Relation – boundary condition - Fibonacci sequence – generating function .

UNIT II **12 hours**

Permutation – Ordered seletion – unordered selection – further remarks on Binomial theorem.

UNIT III **12 hours**

Passing within a set – Pairing between set and optimal assignment problem – Gala's optimal assignment problem.

UNIT IV **12 hours**

Fibonacci type relation – using generating function – Miscellaneous method – counting simple electrical networks .

UNIt V **12 hours**

The inclusion – Exclusion principle - Rook polynomial.

TEXT BOOKS

1. Ian Anderson Oxford, A First Course in Combinatorial Mathematics, Applied Mathematics and Computing Science Series, UK, 2013.

2. V.K.Balakrishnan, Combinatorics, Schuam Series, 1996

Course Code	Course Title	L	T	P	C
MAS1263	Fuzzy Mathematics	4	-	-	4

Objectives

- To know the fundamentals of fuzzy Algebra.
- To know the basic definitions of fuzzy theory
- To know the applications of fuzzy Technology.

UNIT I **12 hours**

Introduction- Fuzzy subsets-Lattices and Boolean Algebras- L fuzzy sets-operations on fuzzy – level sets – properties of fuzzy subsets of a set section s 1.1-1.10

UNIT II **12 hours**

Algebraic product and sum of two fuzzy subsets-properties satisfied by Addition and product-cartesian product of fuzzy subsets. Sections 1.11-1.13.

UNIT III **12 hours**

Introduction- Algebra of fuzzy relations-logic-connectives. section s 2.1-2.4

UNIT IV **12 hours**

Some more connectives-Introduction-fuzzy subgroup-homomorphic image and Pre-image of subgroupoid. Sections 2.5,3.1-3.3

UNIT V **12 hours**

Fuzzy invariant subgroups-fuzzy subrings.
Section 3.4 and 3.5.

TEXT BOOKS

S. Nanda and N. R. Das Fuzzy Mathematical concepts, Narosa Publishing House, New Delhi, 2010.

Course Code	Course Title	L	T	P	C
MAS1264	Mathematical Software Practicals - MATLAB	-	-	4	2

LIST OF EXPERIMENTS

1. Fibonacci Numbers
2. Matrices
3. Solution of Linear Equations
4. Eigen values and singular values of matrices
5. Zeros and roots
6. Exponential function
7. Ordinary Differential Equations
8. Least square curve fitting
9. Interpolation
10. Construct the polynomial $y = (x+2)^2(x^3+1)$ for values of x from minus one to one in steps of 0.1.
11. Construct the function $y = \frac{x^2}{x^3+1}$ for values of x from one to two in steps of 0.01.

REFERENCES:

1. Steven C.Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, Tata McGraw Hill Publishing Company Ltd., 2007.
2. Technical Analysis and applications with Matlab, Stanley printed and bounded in India by Barkha Nath. Printers, Delhi, Reprint, 2007.
3. Brian R.hunt, Ronald, I.Lipsman, Jonathan.M.Rosenberg, A guide to Matlab for beginners and experienced users, Printed in India at Raplika Press Pvt. Ltd., Kundly, Cambridge University Press, Reprint, 2005.