BACHELOR OF SCIENCE (MATHEMATICS)

CURRICULUM and SYLLABUS

(For students admitted from the academic year 2015-2016)

UNDER CHOICE BASED CREDIT SYSTEM

DEPARTMENT OF MATHEMATICS

FACULTY OF SCIENCE AND HUMANITIES

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

SRM NAGAR, KATTANKULATHUR – 603 203

B.Sc Mathematics

(For students admitted from the academic year 2015 – 2016 onwards)

Curriculum 2015

(**UNDER CHOICE BASED CREDIT SYSTEM**)

DETAILS OF THE CREDITS

Component	Course	Total number of credits
Part I	Language	8
Part II	English	8
Part III	Major & As	106
Part IV	Skill based courses	10
Part IV	Value Added Course & General	13
Part V	Extension activity	01
	Total	146

Eligibility

The candidates seeking admission to the B.Sc.Degree program shall be required to have passed (10+2) (Higher Secondary) examination or any other equivalent examination of any authority, recognized by this University, with Physics, and Chemistry / Computer Science/Mathematics/ Biology.

Duration and Structure of the B. Sc Programme

3 Years (6 Semesters)

B. Sc Mathematics

Curriculum – 2015

(Applicable for students admitted from the Academic Year 2015-16 onwards)

SEMESTER I

Career Stream Title	Course Code	Course Name	L	T	P	Total of TLP	C
Language	ULH15101	Hindi – I	4	1	0	5	4
	ULF15101	French - I	4	1	0	5	4
	ULT15101	Tamil - I	4	1	0	5	4
Language	ULE15101	English-I	4	1	0	5	4
Major Core	UMA15101	Algebra and Trigonometry	4	1	0	5	4
Major Core	UMA15102	Analytical geometry	4	1	0	5	4
Allied Subjects	UPY15161	Physics – I	4	0	0	4	4
Allied Subjects	UPY15162	Physics Practical Lab - I	0	0	4	4	2
Value Added Course Internal Evaluation	CDC15101	Verbal Ability	2	0	0	2	2
Total No. of Credits			22	4	4	**30**	**24**

SEMESTER II

Career Stream Title	Course Code	Course name	L	T	P	Total of TLP	C
Language	ULH15201	Hindi – II	4	1	0	5	4
	ULF15201	French - II	4	1	0	5	4
	ULT15201	Tamil - II	4	1	0	5	4
	ULE15201	English-II	4	1	0	5	4
Major Core	UMA15201	Calculus	4	1	0	5	4
Allied Subjects	UPY15261	Physics - II	4	0	0	4	4
Allied Subjects	UPY15262	Physics Practical Lab - II	0	0	4	4	2
Skill Based Course	UCA15281	Computer Literacy	2	0	2	4	4
Value Added Course (Internal Evaluation)	CDC15201	Quantitative Aptitude and Logical Reasoning – I	2	0	0	2	2
Extension	UNS15201	NSS	0	0	0	0	1
	UNC15201	NCC	0	0	0	0	1
	UYG15201	YOGA	0	0	0	0	1
	USO15201	NSO	0	0	0	0	1
Total No. of Credits			20	3	6	29	**25**

SEMESTER III

Career Stream Title	Course Code	Course name	L	T	P	Total of TLP	C
Major Core	UMA15301	Differential equations and Laplace transforms	4	1	0	5	4
Major Core	UMA15302	Discrete Mathematics	4	1	0	5	4
Major Core	UMA15303	Probability and Statistics	4	1	0	5	4
Allied Subjects	UCY15361	Chemistry – I	4	0		4	4
Allied Subjects	UCY15362	Chemistry Practical Lab – I	0	0	4	4	2

Skill Based Course	UMA15304	Latex and Mathematica - Lab	0	0	4	4	2
Value Added Course (Internal Evaluation)	CDC15301	Quantitative Aptitude and Reasoning – II	2	0	0	2	2
Skill Based Elective		Skill Based Elective – I	3	0	0	3	3
Non Major Elective		Open Elective	2	0	0	2	2
Total No. of Credits			23	3	8	**34**	**27**

SEMESTER IV

Career Stream Title	Course Code	Course name	L	T	P	Total of TLP	C
Major Core	UMA15401	Vector calculus, Fourier series and Fourier transforms	4	1	0	5	4
Major Core	UMA15402	Numerical analysis	4	1	0	5	4
Major Core	UMA15403	Numerical Methods using C Language	0	0	4	4	2
Allied Subjects	UCY15461	Chemistry – II	4	0	0	4	4
Allied Subjects	UCY15462	Chemistry Practical lab - II	0	0	4	4	2
Value Added Course (Internal Evaluation)	CDC15401	Communication Skills	2	0	0	2	2
Skill Based Elective		Skill Based Elective – II	3	0	0	3	3
Non Major Elective		Open Elective	2	0	0	2	2
Total No. of Credits			19	2	8	29	23

SEMESTER V

Career Stream Title	Course Code	Course name	L	T	P	Total of TLP	C
Major Core	UMA15501	Real analysis	4	1	0	5	4
Major Core	UMA15502	Algebraic structures	4	1	0	5	4
Major Core	UMA15503	Operation research	4	1	0	5	4
Major Core	UMA15504	C++ Programming Lab	0	0	4	4	2
Core Based Elective		Core Based Elective - I	4	0	0	4	4
Core Based Elective		Core Based Elective - II	4	0	0	4	4
Value Added Course	UES15501	Environmental Studies	3	0	0	3	3
Total No. of Credits			23	3	4	**30**	**25**

SEMESTER VI

Career Stream Title	Course Code	Course name	L	T	P	Total of TLP	C
Major Core	UMA15601	Complex Analysis	4	1	0	5	4
Major Core	UMA15602	Graph theory	4	1	0	5	4
Major Core	UMA15603	Mechanics	4	1	0	5	4
Core Based Elective		Core Based Elective - III	4	0	0	4	4
Major Core	UMA15604	Mathematical Software - MATLAB	0	0	4	4	2
Major Core	UMA15605	Core Based Project	0	0	3	3	2
Value Added Course (Internal Evaluation)	CDC15601	Personality Development	2	0	0	2	2
Total No. of Credits			18	3	7	**28**	**22**
Grand Total			125	18	**3 7**	**180**	**146**

Legend:

L - Number of lecture hours per week
T - Number of tutorial hours per week
P - Number of practical hours per week
C - Number of credits for the course
G – General

CORE BASED SUBJECTSED ELECTIVES

- UMA15E01- Linear Algebra
- UMA 15E02- Financial Accounting

- UMA 15E03- Dynamics
- UMA 15E04- Cost Accountancy
- UMA 15E05- Astronomy
- UMA 15E06- Sequences and series

SKILL BASED SUBJECTSED ELECTIVES

- UMA 15E51- Mathematics for Competitive Examination-I
- UMA 15E52- Financial Mathematics
- UMA 15E53-Number Theory
- UMA 15E54-Mathematics for Competitive Examination-II
- UMA 15E55-Combinatorics
- UMA 15E56-Fuzzy Mathematics

SEMESTER I

குறியீட்டு எண்	பாடம்	L	T	P	Total LTP	C
ULT15101	தமிழ்- I	4	1	0	5	4

பகுதி 1. தமிழ்இலக்கியவரலாறு

(நூல் – தமிழ்இலக்கியவரலாறு- முனைவர் சு.ஆனந்தன், கண்மணி பதிப்பகம், திருச்சி, 2010.)

1. சிற்றிலக்கியம் - தோற்றமும் வளர்ச்சியும்
2. புதுக்கவிதை - தோற்றமும் வளர்ச்சியும்
3. சிறுகதை - தோற்றமும் வளர்ச்சியும்
4. புதினம் - தோற்றமும் வளர்ச்சியும்
5. உரைநடை - தோற்றமும் வளர்ச்சியும்

பகுதி 2. இலக்கியம்

அ.இக்காலக்கவிதைகள்

1. பாரதியார்
   நெஞ்சு பொறுக்கு திலையே ...என்றுதொடங்கும்கவிதை
2. பாரதிதாசன்
   உலக ஒற்றுமை - தன்பெண்டு தன்பிள்ளை ...என்றுதொடங்கும்கவிதை
3. ந.பிச்சமூர்த்தி - கிளிக்கூண்டு
4. இன்குலாப் - மரங்களின் சுற்றம்
   சந்திக்கச் செல்வதில்லை...என்று தொடங்கும் கவிதை
5. நா. காமராசன் - கருப்புமலர்கள்
   காகிதப்பூக்கள் - கால மழைத்தூறலிலே... என்று தொடங்கும் கவிதை
6. சு.வில்வரெத்தினம் --வேற்றாகி நின்ற வெளி
   நிலவின் எதிரொலி – பறம்பு மலை ...என்று தொடங்கும்கவிதை
7. பாரதி புத்திரன் - மாரிக்கால இரவுகள்
   சிவகாசிச் சிசுக்கள் – மகனே அன்றொரு நாள் ...என்று தொடங்கும்கவிதை
8. து.நரசிம்மன் - வானம் பிறந்தது
   ஒரு பிஞ்சின் வேண்டுகோள்...என்று தொடங்கும்கவிதை
9. ப.கல்பனா- வானம் பிறந்தது
   கீறல் விழுந்த மாலைக்காலங்கள்- இன்று வர... என்று தொடங்கும்கவிதை

ஆ. சிற்றிலக்கியம்

கலிங்கத்துப்பரணி- போர் பாடியது: 404 -- 408 பாடல்கள்

குற்றாலக்குறவஞ்சி – மலைவளம்

1. வானரங்கள்கனிகொடுத்து .... என்றுதொடங்கும்பாடல்
2. முழங்குதிரைப்புனலருவிகழங்கெனமுத்தாடும் .... என்றுதொடங்கும்பாடல்

இ. காப்பியங்கள்

சிலப்பதிகாரம் – வழக்குரை காதை - 'தேரா மன்னா! செப்புவது உடையேன்;--இணை அடி தொழுது வீழ்ந்தனளே, மடமொழி. (30 – வரிகள்)

பகுதி 3 உரைநடைப்பகுதி

"**எண்ணங்கள்**" டாக்டர் எம்.எஸ்.உதயமூர்த்தி,கங்கை புத்தக நிலையம், 2005.

பாட நூல்கள் :

1. முனைவர் சு.ஆனந்தன் (2010), தமிழ் இலக்கிய வரலாறு, கண்மணி பதிப்பகம், திருச்சி, 2010.

2. எம்.எஸ்.உதயமூர்த்தி, "எண்ணங்கள்",கங்கை புத்தக நிலையம், 2005.
3. செய்யுள் புத்தகம், தமிழ்த்துறை, அறிவியல் மற்றும் மானுடவியல் புலம் , எஸ். ஆர். எம். வெளியீடு, 2014.

Subject Code	Subject Title	L	T	P	Total of LTP	C
ULH 15101	HINDI – I	4	1	0	5	4

INSTRUCTIONAL OBJECTIVES:
1. To express and communicate literature which is part of life
2. To incorporate day to day personal & professional life's need to communicate in the language.
3. To help the students to imagine& express their mind through Literature .

UNIT – I - Prose **(25 Hours)**
1. USNE KAHA THA (STORY) - ***CHANDRADHAR SHARMA GULERI***
2. CHIEF KI DAWAAT (STORY) - ***BHISHAM SAHNI***
3. PREMCHAND (NIBANDH) - ***DR. RAMVILAS SHARMA***
4. BHOLARAM KA JEEV (SATIRE STORY) - ***HARISHANKAR PARSAI***
5. BHAGWAN NE KAHA THA (SATIRE STORY) - ***SURYA BALA***
6. CHAMAR KI BETI (STORY) - ***DR.N. CHANDRSHEKHARAN NAIR***

UNIT – II- OneActPlay **(10 Hours)**
1. LAXMI KA SAWAGAT ***UPENDRANATH ASHK*** -
2. JAB MAA RO PADI ***SETH GOVIND DAS*** -

UNIT – III - CORRESPONDENCE **(10 Hours)**
1. OFFICIAL LETTER
2. DEMI- OFFICIAL LETTER

UNIT – IV - COMPUTER **(10Hours)**

UNIT – V - TECHNICAL TERMINOLOGY **(5 Hours)**

TEXT BOOK
1. Hindi I Edited by Dr.S.Preethi, Dr.MD.Islam, Dr. S. Razia Begum Published by Department of Hindi, FS&H,SRM University

REFERENCE
1. Prayajon Mulak Hindi (Author - *Madhav Sontakke*)

Subject Code	Subject Title	L	T	P	Total of LTP	C
ULF15101	FRENCH-I	4	1	0	5	4

INSTRUCTIONAL OBJECTIVES:
1. To encourage greater written skills through comprehension writing and composition writing.
2. Improve their oral and written skills through a combination of theory and practice.
3. Extend and expand their savoir-faire through the acquisition of latest skills and techniques by practical training.

Unité-I **(15 Heures)**
Vous comprenez? – Conjugaison des verbes – Masculin/Féminin – Singulier/Pluriel – Interrogation – Négation simple- L'identité- Les lieux de la ville- Les mots du savoir-vivre.

Unité - II **(15 Heures)**
Au travail ! Conjugaison – Les verbes en –ER – Accord des noms et des adjectifs - Articles indéfinis et définis- Interrogation- Est-ce-que, Qu'est-ce, Qu'est-ce que c'est, Où- L'état civil- Personnes et objets caractéristiques d'un pays.

Unité - III **(15 Heures)**
On se détend ?- Conjugaison- faire, aller, venir, vouloir, pouvoir, devoir- Futur proche - Pronoms moi, toi, lui, elle, etc.., après une préposition – On = Nous- Les loisirs, Sports, Spectacles, Activités.

Unité - IV **(15 Heures)**
Racontez-moi- Passé composé - Présentation d'un événement passé- La date et l'heure- Les moments de la journée, de l'année- Événements liés au temps - **Bon voyage !**- Comparaison simple- Adjectifs démonstratifs- Adjectifs possessifs- Les Voyages – Les transports.

Unité - V **(15 Heures)**

Bon appétit- Articles partitif- Emploi des articles- Interrogation, forme avec inversion- Réponses : Oui, Si, Non- Forme possessive : à+pronom- La nourriture, Les repas, La fête.

REFERENCES

1. **''Echo-A1''**, Méthode de français, J.GIRARDET, J.PECHEUR, CLE International, Janvier-2011.

COURSE CODE		COURSE TITLE	L	T	P	Total of LTP	C
ULE15101		ENGLISH-I	4	1	0	5	4
	OBJECTIVES						
1.		To enhance students' proficiency in English language.					
2.		To enable the students to think in English.					
3.		To be abreAst with the world literature.					
4.		To equip students with the awareness and strategies needed to enable the study of English As a lifelong process.					
5.		To engage in ongoing professional development with respect to both teaching and research.					

UNIT I - Poetry:

1. If by Rudyard Kipling
2. Where the Mind is Without Fear by Rabindranath Tagore
3. The Road Not Taken by Robert Frost
4. Snake by D. H. Lawrence

UNIT II - Prose:

1. Of Truth by Francis Bacon
2. Spirit of India by A.P.J.Abdul Kalam

UNIT III - Short Stories:

1. The Bet by Anton Chekhov
2. The Postmaster by Rabindranath Tagore

UNIT IV - Movie Review:

1. Whose Life is it Anyway?
2. The Accused- Feature Film
3. Water

UNIT V - Language Component :

1. Tenses
2. Focus on Articles, Prepositions, Subject Verb Agreement
3. Comprehension Passage

TEXT BOOKS

1. Cambridge University Press,. Raymond Murphy, *Essential Grammar in Use*, 3rd Edition, 2010.
2. English-I& II, Edited by Dr.Shanthichitra, Published by Department of English, FSH, SRM University.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15101	ALGEBRA AND TRIGONOMETRY	4	1	0	5	4

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

UNIT I - MATRICES

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 - THEORY OF EQUATIONS

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 – RECIPROCAL EQUATIONS

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 – TRANSFORMATION OF EQUATIONS

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

UNIT V - TRIGONOMETRY

Expansions of $\sin n\theta$, $\cos n\theta$ and $\tan n\theta$ – Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions and their properties – Logarithm of a complex number – Principal values – problems.

TEXT BOOKS

1. T. K. ManickavAsagam Pillai, Natarajan and Ganapathy, Algebra, Volume II, S.Viswanathan Pvt. Ltd., 2004.
2. S. Narayanan and T. K. Manickavachagam Pillai, Trigonometry, S. Viswanathan Printers & Publishers, (Reprint), 2012.

REFERENCES

1. T.K.Manickavachagam Pillai, Matrices, S.Viswanathan Printers & Publishers, 2012.
2. S. Sudha, Algebra, Analytical Geometry (2D) and Trigonometry, Emerald publishers, 1998.
3. P. Duraipandian, Trigonometry, Emerald publishers, 2009.
4. A. Singaravelu, Algebra & Trigonometry, Vol. I & II, Meenakshi Agency, 2003.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15102	ANALYTICAL GEOMETRY	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	To learn about analytical geometry two dimensional in polar coordinates.
2.	To understand about straight lines in three dimensional.
3.	To have knowledge about sphere, cone and cylinder.
4.	Be familiar with coincides

UNIT I – CONICS

Polar coordinates equation of a conic – directrix - chord tangent-normal- simple problems - only in deriving equation of a conic.

UNIT II – STRAIGHT LINES

Straight lines - co planarity of straight-line-shortest distance (S.D) and equation of S.D between two lines-simple problems.

UNIT III - SPHERE

Standard equation of sphere-results based on the properties of a sphere-tangent plane to a sphere- equation of a circle.

UNIT IV – CONE AND CYLINDER

Cone whose vertex is at the origin- envelope cone of a sphere-right circular cone-equation of a cylinder-right circular cylinder.

UNIT V - CONICOIDES

Nature of a conicoide - standard equation of central conicoid –enveloping cone tangent plane-condition for tangency –director Sphere-director plane

TEXT BOOKS

1. P. Durai Pandian, Text book of Analytical Geometry-2 Dimensional, Asia Publishing House, 1968.
2. N.P. Bali, Solid Geometry, Laxmi Publications (P) Ltd, 2005.

REFERENCES

1. S.Narayanan, T.K.ManickavAsgam Pillai, Calculus-I & II, Viswanathan Publications, 2004.
2. M.L. Khanna, Solid Geometry, Jai PrakAsh Nath & Co Publishers, Meerut,2008.
3. P.R.Vittal, Coordinate Geometry, Margham Publishers, 2003.
4. G.B.ThomAs& R.L.Finney, Calculus & Analytic Geometry, Addison Wesley, MAss (Indian Print), 1998.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UPY15161	Physics - I	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
1.	To understand the fundamentals of physics.
2.	To give the basic understanding of material properties.
3.	To educate and motivate the students in the field of science.
4.	To acquire knowledge on magnetism and dielectrics.

UNIT I - SIMPLE HARMONIC MOTION AND CIRCULAR MOTION

Time period - Amplitude - Phase - Spring mass system - Simple pendulum, Composition of two simple harmonic motions of equal periods in a straight line and at right angles - Lissajous figures - Damping force - Damped harmonic oscillator - 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

Elasticity and plasticity - Elastic constants - Bending of beams - Young's modulus by non - uniform bending - Torsion in a wire - determination of rigidity modulus of torsion pendulum - Viscosity - Coefficient of viscosity - Poissuelle's formula - Stoke's law - terminal velocity. Surface tension: Molecular theory of surface tension - Excess pressure inside a drop and bubble.

UNIT III - HEAT AND THERMODYNAMICS

Kinetic theory of gases - basic postulates, ideal gaslaws - 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

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 - EM waves - Maxwell's equations in free space.

UNIT V –GEOMETRICAL OPTICS

Light and Optics - Fermat's principle, laws of reflection and refraction - total internal reflection and its illustrations. Mirrors and lenses - lens formula - combinations 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.

TEXT BOOKS

1. R. Resnick and D. Halliday, *Fundamentals of Physics*, Wiley Publication, 8th Edition, 2011.
2. A. Sundaravelusamy, Allied Physics I, Priya Publications, 2009.

REFERENCES

1. P.V. Naik, *Principles of Physics,*PHI Learning Pvt. Ltd, 2006.
2. Dr. D. John Thiruvadigal, Dr. S. Ponnusamy, Dr. L. Sudha and M. Krishnamohan,*Physics for Technologists,* Vibrant Publication, 2013.
3. J. B. Rajam, *Physics for Technologists*, S. Chand,1981.
4. Brijilal and Subramanian, *Elements of properties of matter*, S. Chand Limited, 1974.
5. M. W. Zemansky and R.H. Ditlman,*Heat and Thermodynamics*, Tata Major Coregraw Hill, 2011.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UPY15162	PHYSICS PRACTICAL LAB - I	0	0	4	4	2

	INSTRUCTIONAL OBJECTIVES
1.	To acquire bAsic understanding of laboratory techniques.
2.	To educate the bAsics of instrumentation, data acquisition and interpretation of results.
3.	To educate and motivate the students in the field of science.
4.	To allow the students to have a deep knowledge of fundamentals of optics.

LIST OF EXPERIMENTS

1. Determination of Young's Modulus- Uniform bending Method.
2. Determination of Young's Modulus- Non Uniform bending Method.
3. Determination of Rigidity Modulus of a wire – Torsional pendulum.
4. Determination of thermal conductivity of a bad conductor using Lee's disc method.
5. Calibration of Voltmeter using potentiometer.
6. Calibration of Ammeter using potentiometer.
7. Determination of magnetic susceptibility using Quincke's Method.
8. Determination of dispersive power of a prism using spectrometer.
9. Determination of Cauchy's constant using spectrometer.

TEXT BOOKS

1. C.H. Bernard and C.D. Epp, John, *Laboratory Experiments in College Physics* Wiley and Sons, Inc., 1995.
2. M.N. SrinivAsan, *A Textbook of Practical Physics*, Sultan Chand & Sons, 1994.

REFERENCES

1. G. L. Squires, *Practical Physics*, 4th Edition, Cambridge University Press, 2001.
2. Geeta Sanon, B. Sc., *Practical Physics, 1st Edition*, S. Chand & Co, 2007.
3. Benenson, Walter, and Horst Stöcker, *Handbook of Physics, S*pringer, 2002.
4. Chattopadhyay, Rakshit and Saha, *An Advanced Course in Practical Physics*, 8th Edition, Books & Allied Ltd., 2007.
5. Indu Prakash and Ramakrishna, *A Text Book of Practical Physics*, 11th Edition, Kitab Mahal, 2011.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
CDC15101	VERBAL ABILITY (Internal Evaluation Only)	2	2	0	4	2

	INSTRUCTIONAL OBJECTIVES
1.	Take up competitive exams confidently
2.	Communicate with better diction

UNIT I - Vocabulary- Synonyms, Antonyms, Idioms and phrases, ordering of words/sentences.
UNIT II - Grammar- Sentence improvement, Change of speech, sentence correction.
UNIT III - Vocabulary-One word Substitute, Verbal Analogies, Closet test.
UNIT IV - Grammar- Spotting errors, selecting words, sentence completion
UNIT V - Vocabulary- Word Quest, Puzzles, Crossword

TEXT BOOKS

1. Raymond Murphy (2007), Essential English Grammar, Cambridge, University Press.
2. Raymond Murphy (2007), Intermediate English Grammar, Cambridge, University Press.
3. Raymond Murphy (2007), Advanced English Grammar Cambridge, University Press.

BOOKS FOR REFERENCE:

1. Norman Lewis (2011), Word Power Made Easy New Revised and Expanded Edition, Goyal publication.
2. Prabhu.C, Vivekanandan.P (2012), The Essentials of Quantitative Aptitude and Verbal Aptitude, Enrich & Excell, BEACON, Chennai

SEMESTER – II

குறியீட்டு எண்	பாடம்	L	T	P	Total LTP	C
ULT15201	தமிழ்- II	4	1	0	5	4

பகுதி -1 தமிழ்இலக்கியவரலாறு

(நூல் – தமிழ்இலக்கியவரலாறு- முனைவர் சு.ஆனந்தன், கண்மணி பதிப்பகம், திருச்சி, 2010.)

1. சங்க இலக்கியங்கள்
2. நீதி இலக்கியங்கள்
3. பக்தி இலக்கியங்கள்
4. காப்பியங்கள்

பகுதி -2 அ. சங்கஇலக்கியம்

1. முளி தயிர் பிசைந்த... என்றுதொடங்கும்**குறுந்தொகை(167)**பாடல்முல்லை, செவிலித்தாய் கூற்று).
2. மனை நடு வயலை வேழம் சுற்றும்... என்றுதொடங்கும் **ஐங்குறுநூறு**(11) பாடல் (மருதம்,ஐங்குறுநூறு- வேழப்பத்து.)
3. எம்வெங்காமம்இயைவதுஆயின் ....என்றுதொடங்கும்**அகநானூறு (15)** பாடல் (**பாலை , மகட்போக்கியதாய்சொல்லியது**)
4. சுடர் தொடீஇ கேளாய்.....என்றுதொடங்கும்**கலித்தொகை (51)**பாடல் (குறிஞ்சி, தலைவிகூற்று)
5. மண்டு அமர் அட்ட ...என்றுதொடங்கும்**புறநானூறு (213)** பாடல், பாடியவர் :புல்லாற்றூர் எயிற்றியனார், பாடப்பட்டோன் : கோப்பெருஞ்சோழன்; திணை :வஞ்சி; துறை- துணைவஞ்சி.
6. **நறவுவாய் உறைக்கும் நாகுமுதிர் ...** என்றுதொடங்கும்**பத்துப்பாட்டு –**சிறுபாணற்றுப்படை (51-67) பாடல்
7. கலந்தோர்உவப்பஎயில்பலகடையி**...** என்றுதொடங்கும்**பத்துப்பாட்டு -- மதுரைக்காஞ்சி (220-237)** பாடல்.

ஆ. நீதிஇலக்கியம்

1. திருக்குறள்- நட்பாராய்தல்
   புலவி நுணுக்கம் (2 அதிகாரம்)
2. நாலடியார்- பொருட்பால்- மேன்மக்கள் – 5 பாடல்

இ. பக்திஇலக்கியம்

சைவம் – பன்னிருதிருமுறைகள்

1. திருஞானசம்பந்தர்தேவாரம் – முதலாம்திருமுறை
   காதல் ஆகி, கசிந்து ... என்றுதொடங்கும்பாடல்
2. திருநாவுக்கரசர்தேவாரம் - ஐந்தாம் திருமுறை
   மாசில் வீணையும் மாலை ... என்றுதொடங்கும்பாடல்
3. சுந்தரர்தேவாரம் – ஏழாம்திருமுறை
   பொன்னார் மேனியனே ... என்றுதொடங்கும்பாடல்
4. மாணிக்கவாசகர் – திருவாசகம் – பிடித்தபத்து
   பால்நினைந்துஊட்டும்தாயினும்சால ... என்றுதொடங்கும்பாடல்
5. திருமூலர் – திருமந்திரம்
   மரத்தை மறைத்தது மாமத யானை ... என்றுதொடங்கும்பாடல்

வைணவம் – நாலாயிரத்திவ்யப்பிரபந்தம்

1. பூதத்தாழ்வார்

பெருகு மத வேழம் மாப்பிடிக்கு…என்றுதொடங்கும்பாடல்

2. குலசேகராழ்வார்

ஆனாதசெல்வத்துஅரம்பையர்கள்தற்சூழ ...என்றுதொடங்கும்பாடல்

3. பெரியாழ்வார்

எந்நாள் எம்பெருமான் ...என்றுதொடங்கும்பாடல்

4. ஆண்டாள்

ஓங்கி உலகளந்த உத்தமன் … என்றுதொடங்கும்பாடல்

5. திருப்பாணாழ்வார்

சதுர மாமதில் சூழ் இலங்கைக்கு … என்று தொடங்கும் பாடல்

இஸ்லாம்

குணங்குடிமஸ்தான்சாகிபுபாடல்கள் –தவமேபெறவேண்டுமெனல்- 3 பாடல்கள்

கிறித்துவம்

ஆதிநந்தாவனப்பிரளயம்– ஏதேன்தோட்டம்- 3 பாடல்கள்

பகுதி 3:சிறுகதை

"**ஒற்றைச் சிறகு**",இலக்கியச்சிந்தனை 2012 ஆம்ஆண்டின்சிறந்தசிறுகதைகள்தொகுப்பு.

பாட நூல்கள் :

1. முனைவர் சு.ஆனந்தன் (2010), தமிழ் இலக்கிய வரலாறு, கண்மணி பதிப்பகம், திருச்சி, 2010.
2. ஒற்றைச் சிறகு, இலக்கியச்சிந்தனை 2012 ஆம்ஆண்டின்சிறந்தசிறுகதைகள்தொகுப்பு, 2012.
3. செய்யுள் புத்தகம், தமிழ்த்துறை, அறிவியல் மற்றும் மானுடவியல் புலம் , எஸ். ஆர். எம். வெளியீடு, 2014.

Subject Code	Subject Title	L	T	P	Total of LTP	C
ULH 15201	HINDI-II	4	1	0	5	4

INSTRUCTIONAL OBJECTIVES:

1. To express and communicate literature which is part of life
2. To incorporate day to day personal & professional life's need to communicate in the language.
3. To help the students to imagine & express their mind through Literature .

UNIT - I POETRY **(25 Hours)**

1. Suprashid Dohey ***Kabir, Rahim, Bihari, Surdas*** -
2. Nar Ho Na Nirash Karo Mann Ko ***Maithlisharan gupt***-
3. Jo Tum Aaa Jaate***Mahadevi Varma*** -
4. Hum Panchi Unmukt Gagan Ke ***Shiv mangal singhsuman*** **-**
5. Chalawa ***Santosh shreeyansh*** -
6. Yahan Thi Vaha Nadi ***Manglesh Dabral*** -

UNIT - IISTORY **(15 Hours)**

1. Eidgaha ***Premchand*** -
2. Vapsi ***Priyamvada Usha*** -
3. Ek Muthi Aakash ***Santosh Srivastav***
4. Ek Plate Sailab ***Mannu Bhandari*** -

UNIT - III **(10 Hours)**

1. Anuvad : Anuvad Ki Paribhasha Evam Bhed

UNIT- IV **(5 Hours)**

1. Anuvad : English to Hindi

UNIT -V **(5 Hours)**

1. Administrative words

TEXT BOOK

1. Hindi I Edited by Dr.S.Preethi, Dr. MD.Islam, Dr.S.Razia Begum.Published by Department of Hindi, FS&H,SRM.University

REFERENCES

1. Prayajon Mulak Hindi (Author - Madhav Sontakke)
2. Practcal Guide to is Translation & Composition (Author- K. P. Thakur)

Subject Code	Subject Title	L	T	P	Total of LTP	C
ULF15201	FRENCH-II	4	1	0	5	4

INSTRUCTIONAL OBJECTIVES:

1. Consolidate the knowledge of theoretical aspects of French grammar with examples provided from different angles: from present day literature, day to day conversation.
2. Improve their oral and written skills through a combination of theory and practice.

Unité-I **(15 Heures)**

Quelle journée !- La conjugaison pronominale- L'impératif- L'expression de la quantité : peu, un peu de, quelque, etc..,- Les activités quotidiennes- Les achats, L'argent - **Qu'on est bien ici !** Prépositions et adverbes de lieu- Verbes exprimant un déplacement : emploi des prépositions- Le logement, La localisation, L'orientation, L'état physique, Le temps qu'il fait.

Unité - II **(15 Heures)**

Souvenez-vous- L'imparfait- Emploi du passé composé et de l'imparfait- Expression de la durée- L'enchainement des idées : alors, donc, mais- Les sens réciproque- Les moments de la vie- La famille- Les relations amicales, amoureuses, familiales.

Unité - III **(15 Heures)**

On s'appelle ? – Les pronoms compléments directs- les pronoms compléments indirects de personne- L'expression de la fréquence et de la répétition – Les moyens de communication : courrier, téléphone, internet.

Unité - IV **(15 Heures)**

Un bon conseil ! – Expression du déroulement de l'action – Passé récent- Présent progressif – Futur proche – Action achevée/ inachevée – Les phrases rapportés – Les Corps – La santé et la maladie.

Unité - V **(15 Heures)**

Parlez-moi de vous – La place de l'adjectif – La proposition relative finale avec « qui » - C'est/il est – Impératif des verbes avec pronoms – La formation des mots – La description physique et psychologique des personnes – Les vêtements – Les Couleurs.

REFERENCES

1. **''Echo-A1''**, Méthode de français, J.GIRARDET, J.PECHEUR, CLE International, Janvier-2011.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
ULE15201	ENGLISH-II	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	To enhance students' proficiency in English language.
2.	To enable the students to think in English.
3.	To be abreast with the world literature.
4.	To equip students with the awareness and strategies needed to enable the study of English As a lifelong process.
5.	To engage in ongoing professional development with respect to both teaching and research.

UNIT I - POETRY

1. The Hawk in the Rain by Ted Hughes
2. Crutches by Bertolt Brecht
3. Obituary- A. K. Ramanujan
4. Dream Deferred- Langston Hughes

UNIT II - PROSE

1. The Story of my Experiments with Truth by M.K. Gandhi (Excerpts)
2. I have a Dream by Martin Luther King
3. Farewell Speech by Mark Antony

UNIT III - PLAY AND SHORT STORY

1. Monkey's Paw by W.W.Jacobs
2. Bear by Anton Chekhov

UNIT IV - BOOK REVIEW

Excerpts from - 'To kill a Mocking Bird',
'Merchant of Venice'

UNIT V - LANGUAGE COMPONENT

1. Transformation of Sentences
2. Jumbled Sentences
3. Précis Writing

TEXT BOOKS

1. Cambridge University Press,. Raymond Murphy, Essential Grammar in Use 3rd Edition 2010.
2. English-I& II, Edited by Dr.Shanthichitra, Published by Department of English, FSH, SRM University.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15201	CALCULUS	4	1	0	5	4
	INSTRUCTIONAL OBJECTIVES					
1.	Solve problems using expansion of functions					
2.	Familiar with curve tracing					
3.	Apply integral calculus in solving problems					
4.	Have a clear understanding of analytical geometry					
5.	Have a thorough knowledge of conics					

UNIT I - DIFFERENTIAL CALCULUS

n^{th} derivative - Leibnitz's theorem (Without proof) and its application - Jacobians - Total differential - maxima and minima functions of 2 & 3 independent variable, Lagrange's method (without proof), problems on this concepts.

UNIT II - GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS

Polar coordinates – Angle between radius vector and tangent – Angle between two curves, Curvature, Radius of Curvature in Cartesian and Polar coordinates, p-r equation, Evolutes.

UNIT III - ASYMPTOTES

Methods (without proof) of finding Asymptotes of rational algebraic curves with special cases.

UNIT IV - INTEGRAL CALCULUS

Reduction formulae, Beta and Gamma Functions - Properties and Problems.

UNIT V – MULTIPLE INTEGRALS

Double Integrals - Change of order of Integration - Triple Integrals - Applications to Area, Surface Area and Volume.

TEXT BOOK

S.Narayanan and T.K.Manicavachagom Pillay, Calculus – I & II, S.Viswanathan Printers & Publishers Pvt. Ltd, 2004.

REFERENCES

1. P.KandAsamy, K.Thilagavathy, Mathematic for B.Sc. Vol.-I, II, III & IV, S.Chand & Company Ltd., New Delhi-55, 2004.
2. Shanti Narayan, Differential Calculus, Shyamlal Charitable Trust, New Delhi, 2001.
3. Shanti Narayan, Integral Calculus, S.Chand & Co. New Delhi, 2001.
4. S.Sudha, Calculus,Emerald Publishers, Chennai, 1998.
5. G.B.ThomAs and R.L.Finney, Calculus and Analytic Geometry, Addison Wesley , MAss Indian Print,1998.
6. P.R.Vittal, Calculus, Margham Publication, Chennai 2004.

UPY15261	PHYSICS – II	L	T	P	Total of LTP	C
		4	0	0	**4**	4

	Instructional Objectives
1.	To understand the fundamentals of physics.
2.	To emphasize the significance of Green technology and its applications.
3.	To understand the structural, optical, nuclear and electronic properties of solids.
4.	To acquire knowledge on elementary ideas of integrated circuits.

UNIT I - ENERGY PHYSICS

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 - applications - Tidal energy - generation and applications - Hydro energy – generation - applications.

UNIT II - MODERN PHYSICS

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 - Planck's quantum hypothesis - Photoelectric effect - Compton effect - De Broglie equation - uncertainty principle.

UNIT III – WAVE AND FIBRE OPTICS

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

Space lattice - basis - Unit Cell - Lattice parameters - two dimensional and three dimensional Brava is lattices and Crystal systems - Cubic crystal system - Crystal symmetry - reciprocal lattice and its importance - Density & atomic packing fraction - Directions - planes and Miller indices - interplanar distance - NaCl, Zinc sulphide, Hexagonal Closely Packed (HCP) structure - crystal imperfections - X ray diffraction - Laue method - single crystal and powder diffraction

UNIT V - ELECTRONICS

Basic Electronics: P and N - type semiconductors - Junction Diode and their characteristics - half wave - full wave rectifiers - voltage regulations - Zener diode. Junction transistor - PNP - Digital electronics: AND, OR, NOT gates - NAND and NOR As universal building Blocks - boolean algebra - Laws of Boolean algebra - DE Morgan's theorem - their verification using truth table - Elementary ideas of integrated circuits (ICs).

TEXT BOOKS

1. C. Kittel, *Introduction to Solid State Physics*, 8th Edition, Wiley Eastern Ltd,2005.
2. Malvino and Leach, *Digital Principles & their applications*, TataMajor CoreGraw Hill, 2010.

REFERENCES

1. A.K. Jha, *Textbook of Applied Physics,*International Publishing House Pvt. Ltd, 2011.
2. Mansi Karkare and Rajni Bahuguna, *Applied Physics*, Volume – II International Publishing House Pvt. Ltd, 2010.
3. TAsneem AbbAsi, AbbAsi S. A, *Renewable Energy Sources: Their Impact on Global Warming and Pollution* , PHI Learning Pvt. Ltd.2013
4. K. Thyagarajan and Ajay Ghatak, *Introduction to Fiber Optics*, Cambridge, University Press, 1998.
5. B. Grob, Major CoreGrw *BAsic Electronics*, 6th Edition, Major Core Graw Hill, 2010.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UPY15262	PRACTICAL LAB – II	0	0	4	**4**	2

	INSTRUCTIONAL OBJECTIVES
1.	To familiarize with the concept of material properties.
2.	To educate the basics of instrumentation, data acquisition and analysis.
3.	To understand the optical and electronic properties of solids through experimentations.
4.	To enhance the students to understand the concepts in integrated chips.

LIST OF EXPERIMENTS

1. Study the I-V Characteristic of a Solar Cell.
2. Determination of wire thickness using air wedge experiment.
3. Study of attenuation and propagation characteristics of optical fiber cable.
4. Band gap determination using Post Office Box – Specific resistance.

5. Dielectric constant Measurement.
6. Hall effect- Hall coefficient determination.
7. Construction of AND, OR, NOT gates using diodes, resistors and Transistors.
8. NAND gate As a Universal gate.
9. Determination of regulation properties of a given power supply using a integrated circuit (IC).

TEXT BOOKS

1. C. L. Arora, *B.Sc., Practical Physics,* S. Chand & Company Ltd, 2007.
2. Robert Andrews Millikan, Henry Gordon Gale, *Practical Physics*, Nabu Press, 2012

REFERENCES

1. C.Ouseph, K.Rangarajan,*A Text Book of Practical Physics*, Volume I,II, S.Viswanathan Publishers,1997
2. Chauhan and Singh,*Advanced Practical Physics*, Revised Edition, Pragati PrakAshan, 1985.
3. Geeta Sanon, B. Sc., *Practical Physics, 1st Edition,S.* Chand & Co, 2007.
4. R. K. Shukla & Anchal SrivAstava. *Practical Physics*, New Age International (P) Ltd, Publishers, 2006.
5. Thiruvadigal, J. D., Ponnusamy, S. and VAsuhi.P. S., *Materials Science*, Vibrant Publications, 2012.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UCA15281	COMPUTER LITERACY	2	0	2	4	4

UNIT I - INTRODUCTION TO MS OFFICE

MS Word - Working with Documents-Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents- Setting Font styles, Font selection- style, size, colour etc, Type face- Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering - Setting Page style- Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing- Inserting Clip Arts, Pictures/Files etc., Tools – Word Completion, Spell Checks, , Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature. Printing Documents Shortcut keys.

UNIT II - INTRODUCTION TO MS EXCEL

MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus-main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types - Working with Spreadsheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing- Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys - Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula-finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae- Formatting Spreadsheets- Labelling columns & rows, Formatting- Cell, row, column & Sheet, Category- Alignment, Font, Border & Shading, Hiding /Locking Cells, Anchoring objects, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility- Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys.

UNIT III - INTRODUCTION TO MS ACCESS

MS Access: Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

UNIT IV - INTRODUCTION TO MS POWER POINT

MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts- Creating a presentation - Setting Presentation style, Adding text to the Presentation - Formatting a Presentation - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout - Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw - Adding Effects to the Presentation- Setting Animation & transition effect - Printing Handouts, Generating Standalone Presentation viewer.

UNIT V - INTRODUCTION TO INTERNET

Creating an e-mail id using yahoo.com - Creating a text file and sent email - Downloading files, text, picture from email - Checking email - Searching search engine - Insert a text file into web - Composing a email - Sending a group of members to different user - Chatting.

COMPUTER LITERACY (**OFFICE AUTOMATION) LAB SYLLABUS MS-WORD**

1. Text Manipulations.
2. Usage of Numbering, Bullets, Tools and Headers.
3. Usage of Spell Check and Find and Replace.
4. Text Formatting.
5. Picture Insertion and Alignment.
6. Creation of Documents Using Templates.
7. Creation of Templates.
8. Mail Merge Concept.
9. Copying Text and Picture from Excel.
10. Creation of Tables, Formatting Tables.
11. Splitting the Screen.
12. Opening Multiple Document, Inserting Symbols in Documents.

MS-EXCEL

1. Creation of Worksheet and Entering Information.
2. Aligning, Editing Data in Cell.
3. Excel Function (Date, Time, Statistical, Mathematical, Financial Functions).
4. Changing of Column Width and Row Height (Column and Range of Column).
5. Moving, copying, Inserting and Deleting Rows and Columns.
6. Formatting Numbers and Other Numeric Formats.
7. Drawing Borders Around Cells.
8. Creation of Charts Raising Moving.
9. Changing Chart Type.
10. Controlling the Appearance of a Chart.

MS-POWER POINT

Working with Slides

1. Creating, saving, and closing presentation.
2. Adding Headers and footers.
3. Changing slide layout.
4. Working fonts and bullets.
5. Inserting Clipart.
   5.1 Working with Clipart.
   5.2 Applying Transition and animation effects.
6. Run and Slide Show.

INTERNET

1. Creating an E-mail ID.
2. Creating a text file and send to E-mail.
3. Downloading files, text, pictures from E-mail.
4. Checking E-mail.
5. Searching Search Engine.
6. Inserting a text file into web.
7. Sending a group of members to different user.
8. Chatting.
9. Create a simple webpage using HTML.
10. Use frames to Include Image and Videos.
11. Add a Cascading Style sheet for designing the web page.
12. Design a simple online test web page in PHP.
13. Design of a website.

TEXT BOOKS

1. D.P.Curtin, K.Foley, K. Sen and C.Mortin, *Information Technology – the Breaking Wave*, 3rd Edition, 1999.
2. Sawyer William A, *Hutchinsonusing Information Technology Brief version,*Major CoreGraw Hill International Edition, 1999.
3. Alexis Leon &Mathew Leon, *Fundamental of Information Technology*, Vikas Publishing.
4. James A Senn, *Principles, Practices and Opportunities*, Prentice Hall.
   Patsy Fulton-Calkins, *Technologyand Procedures for Administrative Professionals,* Thomson Learning.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
CDC15201	QUANTITATIVE APTITUDE AND LOGICAL REASONING - I	2	0	0	2	2

	INSTRUCTIONAL OBJECTIVES
1.	Critically evaluate various real life situations by resorting to Analysis of key issues and factors
2.	Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

UNIT I - Simple equations - Ratio & Proportion – Variation
UNIT II - Percentages - Profit and loss – Partnership - Simple interest and Compound interest
UNIT III - Deductions – Connectives
UNIT IV - Analytical Reasoning puzzles - Problems on Linear arrangement -Problems on Circular arrangement
UNIT V - Clocks – Calendars - Blood relations

TEXT BOOKS:
1. Agarwal R S (2013), 'Quantitative Aptitude' S.Chand Publishers,
2. Agarwal R S,'A modern approach to Logical reasoning', S.Chand Publishers

BOOKS FOR REFERENCE:
1. Abhijit Guha, Quantitative Aptitude - Major Core Graw Hills Publishers
2. Agarwal R S, 'A modern approach to Logical reasoning' S.Chand Publishers

SEMESTER III

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15301	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	4	1	0	5	4

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

UNIT I - SOLVING ORDINARY DIFFERENTIAL EQUATIONS

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

UNITII – DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS

Second Order Differential Equations with Constant Coefficients - Second Order Differential Equations with Variable Coefficients - Method of Variation of Parameters - Simple Problems.

UNIT III - FORMATION AND SOLVING PDE

Formation of P.D.E by eliminating arbitrary constants and arbitrary functions; Complete Integral; Singular Integral; GIntegral; 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 - HOMOGENEOUS LINEAR DIFFERENTIAL EQUATIONS

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

UNIT V – LAPLACE TRANSFORMS

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 BOOKS

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

REFERENCES

1. M. K. Venkataramanand S. Krishnan, Engineering Mathematics, The National Publishing Co., 2010.
2. Dipak Chatterjee, Integral Calculus and differential equations, TATA Major CoreGraw 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.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15302	DISCRETE MATHEMATICS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	To understand Logic and mathematical reAsoning and to count /enumerate objects in a systematic way. To understand Mathematical induction and recursion.
2.	To understand Set theory, relations and functions and to Read, understand and construct mathematical arguments.
3.	To understand Recurrence Relation, Generating functions.
4.	To understand Algebraic Systems and their applications in coding theory - Group codes.
5.	To understand Boolean algebra and its application to switching theory. To understand grammars, finite state machines and Turing Machines

UNIT I - MATHEMATICAL LOGIC

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 - Mathematical Induction - The existential and universal quantifiers - Predicate calculus including theory of inference.

UNIT II - SET THEORY

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

UNIT III - RECURRENCE RELATION & GENERATING FUNCTIONS

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 - Groups – Properties - Cyclic groups and subgroups – Properties – Cosets – Lagrange's Theorem - Normal subgroups – Group Homomorphism.

UNIT IV - ALGEBRAIC SYSTEMS

Groups – Properties - Cyclic groups and subgroups – Properties – Cosets – Lagrange's Theorem - Normal subgroups – Group Homomorphism.

UNIT V - BOOLEAN ALGEBRA & FORMAL LANGUAGES

Boolean algebra - Application of Boolean Algebra to switching theory.Languages - Recognition and generation - Phase structure grammars and languages – Finite state Machine - Recognition in regular languages.

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 Major Core 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 Major CoreGraw-Hill Publishing company PVT .Ltd., New Delhi, 2003
4. Lipschutz Seymour, Marc Lars Lipson, Discrete Mathematics, Major Core 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, Major CoreGraw Hill Publications, 1985.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15303	PROBABILITY AND STATISTICS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Be thorough with two dimensional random variables and the Transformation of Random variables
2.	Be familiar with basic probability concepts and probability distributions
3.	Be exposed to the testing of hypotheses of both small and large samples
4.	Be familiar with correlation and regression analysis
5.	Understand fully the characteristics of control charts and their applications

UNIT I - PROBABILITY & THEORETICAL DISTRIBUTIONS

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

UNIT II -TRANSFORMATION OF RANDOM VARIABLES

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

UNIT III - TESTING OF HYPOTHESIS

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 - CORRELATION AND REGRESSION

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 – STATISTICAL QUALITY CONTROL

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 BOOK

T. Veerarajan, Probability, Statistics and Random process, Tata Major CoreGraw Hill, 1st reprint, 2004.

REFERENCES

1. S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics, 11th edition, Sultan chand & sons, reprint, 2007.
2. S. P. Gupta, Statistical Methods, Sultan Chand Publication, 35th edition, New Delhi, 2007.
3. Johnson R.A, Miller & Freund's Probability and Statistics for Engineer's, 6th edition, Pearson Education, Delhi, 2006.
4. P. R. Vittal, Mathematical Statistics, Margham Publications, Chennai, 2013.

COURSE CODE	COURSE TITLE	ALLIED SUBJECT	L	T	P	Total of LTP	C
UCY15361	CHEMISTRY I	AS	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
1.	To gain knowledge on the importance of basic organic chemistry
2.	To acquire knowledge about hydrocarbons and their reactions
3.	To understand the importance of silicon and metals
4.	To acquire knowledge in chemical kinetics
5.	To gain knowledge in photochemistry

UNIT I - INTRODUCTION OF HYBRIDISATION AND ISOMERISM

Hybridisation - sp, sp^2 and sp^3 - Bond length, bond angle, dipole moment, inductive effect, mesomeric effect and hyperconjucation - Isomerism-geometrical and optical isomerism, optical activity, Asymmetry, dissymmetry, elements of symmetry, R, S notations.

UNIT II - HYDROCARBONS

Methods of preparation of alkanes, properties- reactions. Free radical mechanism of halogention of alkanes, 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, SILICON AND METALS

Occurrence, extraction and chemical properties of iron, cobalt, nickel and copper.Position of hydrogen in periodic table, atomic hydrogen and isotopes of hydrogen.Preparation and structure of borozole, SiO_2, SiC and $SiCl_4$.

UNIT IV - CHEMICAL KINETICS

Rate of reaction, order, molecularity, first order rate law and simple problems, half life period of first order reaction, pseudo first order reaction, zero and second order reactions. Arrhenius and collision theories.

UNIT V - PHOTOCHEMISTRY

Difference between photochemical reactions and dark reactions. Laws of photochemistry-Einstein law of photochemical equivalence, quantum yield. Kinetics of Hydrogen-chlorine, Hydrogen-bromine.Fluorescence, phosphorescence.

TEXT BOOKS

1. Puri B.R., Sharma L.R., Kalia K.K., *Principles of Inorganic Chemistry*, Shobulal Nagin Chand & Co, 2001.
2. P. L. Soni, *A Textbook of Inorganic Chemistry,* Sultan Chand & Co., 1977.

REFERENCES

Bahl B.S. and Arun Bahl, A *text book of Organic Chemistry*, 21st Edition, Sultan Chand & Co., 2012.

COURSE CODE	COURSE TITLE	ALLIED SUBJECT		L	T	P	Total of LTP	C
UCY15362	CHEMISTRY PRACTICAL LAB - I	AS		0	0	4	4	2
	INSTRUCTIONAL OBJECTIVE							
	To enable the students to develop skills in volumetric analysis.							

VOLUMETRIC ANALYSIS

Acidimetry & Alkalimetry

1) Estimation of HCl using standard oxalic acid
2) Estimation of NaOH using standard sodium carbonate

Permanganametry

3) Estimation of FAS using standard oxalic acid
4) Estimation of $KMnO_4$ using standard potassium dichromate

Dichrometry

5) Estimation of $FeSO_4$ using standard FAS.

Complexometric or EDTA titration

6) Estimation of Zn/Mg

Iodimetry

7) Estimation of Ascorbic acid
8) Estimation of phenol / aniline

TEXT BOOK

V. Venkateswaran, R. VeerAswamy, A.R. Kulandaivelu, *BAsic Principles of Practical Chemistry,* Sultan Chand & Sons, Second edition-1997.

REFERENCES

N.S. GnanapragAsam and G. Ramamurthy, *Organic Chemistry – Lab Manual*, S. Viswanathan & Co. Pvt. Ltd., 1998.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA 15304	LATEX AND MATHEMATICA - LAB	0	0	4	4	2
	INSTRUCTIONAL OBJECTIVES					
1.	To introduce some basic concepts and give practice on different statistical techniques using SYSTAT.					

Introduction to computers and algorithm, Languages:C/C++, Packages:
Latex, MAPLE, MATHEMATICA

References:

1. Brian W. Kernighan, Dennis M. Ritchie: The C Programming Language. Prentice Hall.
2. E. Balaguruswamy: Programming in ANSI C.
3. B. Stroustrup: The C++ Language. Addison-Wesley.
4. E. Balaguruswamy: Object-Oriented programming with C++.
5. T. Cormen, C. Leiserson, R. Rivest, C. Stein: Introduction to Algorithms. Major CoreGraw-Hill Science.
6. Leslie Lamport: LaTex: A Document Preparation System. Addison-Wesley Professional1994.
7. References for Matlab, Mathematica etc are As per instructor's recommendation.

Unit – I: Special Characters, Document layout and organization – Document class, Page style, Parts of the document, Centering and indenting, Lists, Theorem–like declarations, Boxes, Tables.

Unit – II: Footnotes and marginal notes, Mathematical formulas – Mathematical environments, Main elements of math mode, Mathematical symbols, Additional elements, Fine–tuning mathematics, Drawing pictures with LATEX.

Unit – III: INTRODUCTION TO MATHEMATICA Running Mathematica - Numerical calculations – Building up calculations – Using the Mathematica system – Algebraic calculations - Symbolic mathematics - Numerical mathematics.

Unit – IV: ADVANCED MATHEMATICS IN MATHEMATICA Numbers - Mathematical functions – Algebraic manipulation – Manipulating equations - Calculus.

Unit – V: Series, limits and residues - Linear algebra.

Text Book:

"A Guide to LATEX" by **H. Kopka** and **P.W. Daly**, Third Edition, Addison – Wesley, London, 1999. Unit I : Chapter 2: Section: 2.5, Chapter 3: Sections: 3.1 - 3.3, Chapter 4: Sections: 4.2, 4.3, 4.5, 4.7, 4.8. Unit II : Chapter 4: Sections: 4.10, Chapter 5: Sections: 5.1 - 5.5, Chapter 6: Section: 6.1.

"The Mathematica Book" by **S. Wolfram,** Fourth Edition, Cambridge University Press, Cambridge, 1999. Unit-III: Chapter 1: Sections: 1.0 - 1.6. Unit-IV: Chapter 3: Sections: 3.1 - 3.5. Unit-V : Chapter 3: Sections: 3.6 - 3.7.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
CDC15301	QUANTITATIVE APTITUDE AND RESONING - II	2	0	0	2	2

	INSTRUCTIONAL OBJECTIVES
1.	Critically evaluate various real life situations by resorting to Analysis of key issues and factors
2.	Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions

UNIT I:

- Numbers
- Time and Distance
- Time and Work
- Averages, Mixtures and Allegations

UNIT II:

- Data Interpretation
- Data Sufficiency
- Mensuration
- Permutation and Combinations
- Probability

UNIT III:

- Cubes
- Venn diagrams
- Binary Logic

UNIT IV:

- Number and letter series
- Number and Letter Analogies
- Odd man out

UNIT V:

- Coding and decoding
- Direction sense test
- Critical Reasoning
- Lateral reasoning puzzle

SEMESTER IV

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15401	VECTOR CALCULUS, FOURIER SERIES AND FOURIER TRANSFORMS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Familiar with physical interpretation of divergence and curl of a vector
2.	Be exposed to evaluating line, surface and volume integrals
3.	Be thorough with the study of Fourier series expansions
4.	Be familiar with half range Fourier series and harmonic analysis
5.	Be thorough with properties and theorems on Fourier transforms with applications

UNIT I – VECTOR CALCULUS

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 – LINE AND VOLUME INTEGRAL

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

UNIT III – FOURIER SERIES

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 - HALF RANGE COSINE AND SINE SERIES

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

UNIT V - FOURIER TRANSFORM

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 BOOK

P.R.Vittal & V.Malini, Vector Calculus, Fourier series and Fourier transforms, Margham Publications, 2004.

REFERENCES

1. S.Narayanan and T.K.Manickavachagam Pillai, Vector algebra and Analysis, S.Viswanathan Pvt. Ltd., 1995.
2. S.Narayanan and T.K.Manickavachagam Pillai, Calculus, Volume III, Vijay Nicole Imprints Pvt. Ltd., Chennai, 2004.
3. A.R.VAsistha and R.K.Gupta, Integral Transforms, Krishna PrakAshan Media Pvt. Ltd., New Delhi, 2011.
4. S. Narayanan, R. Hanumantha and T. K. Manickavachagam Pillai, Ancillary Mathematics, Volume I & II, S.Viswanathan Printers, Chennai, 2007.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15402	NUMERICAL ANALYSIS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Solve equations numerically by direct and iterative methods
2.	Be familiar with interpolation and numerical differentiation & integration
3.	Be exposed to best approximations and spline approximations
4.	Solve equations using predictor – corrector methods
5.	Be thorough with elliptic, parabolic and hyperbolic equations

UNIT I - DIRECT AND ITERATIVE METHODS

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

UNIT II - NUMERICAL DIFFERENTIATION AND INEGRATION

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 - POLYNOMIAL APPROXIMATION

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

UNIT IV– NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS

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 – NUMERICAL SOLUTION OF PARTIAL DIFFERNTIAL METHODS

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

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 Major CoreGraw-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	Total of LTP	C
UMA15403	Numerical Methods using C Language	0	0	4	4	2

	INSTRUCTIONAL OBJECTIVES
1.	To learn how to find roots of algebraic and transcendental equations
2.	To learn how to solve linear equations
3.	To learn the numerical differentiation and integration
4.	To learn how to solve partial differential equations.

LIST OF PROBLEMS

Programming in C for solving the following set of problems:

1. Gauss elimination method.
2. Gauss-Jacobi method.
3. Gauss-Siedel method.
4. Power method (eigenvalue).
5. Newton's forward and backward interpolation.
6. Lagrange interpolation.
7. Trapezoidal and Simpson one-third rules.
8. Euler's method.
9. Runge-Kutta's method.
10. Predictor-corrector method.

TEXT BOOKS

T.Veerarajan and T. Ramachandran, Numerical methods with programs in C, Tata Major CoreGraw Hill, (2006).

REFERENCES

1. E. SrinivAsa Reddy, C Programming & Numerical Analysis, Pearson Education India, 2010.
2. Xevier, C, C Language and Numerical Methods, New Age International publishers, 2003.
3. J. G. Kori, Numerical Methods in 'C',Firewall Media publishers, 2002.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UCY15461	CHEMISTRY - II	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
1.	To gain knowledge on the importance of carbohydrates and heterocyclic compounds.
2.	To acquire knowledge about coordination compounds.
3.	To promote the importance of industrial chemistry.
4.	To acquire knowledge in phase rule and adsorption.
5.	To gain knowledge in fundamentals in electrochemistry.

UNIT I - CARBOHYDRATES, BENZENE AND HETEROCYCLIC COMPOUNDS

Classification of carbohydrates–Properties and uses of glucose and fructose-mutarotation - Chemistry of benzene - preparation, mechanism of electrophillic substitution reactions. Heterocyclic compounds– Preparation and properties of pyrrole and pyridine.

UNIT II - COORDINATION CHEMISTRY

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.

UNIT III - INDUSTRIAL CHEMISTRY

Hardness of water – temporary and permanent hardness, disadvantages of hard water - boiler scales and sledges - softening of hard water – Zeolite process - demineralization process and reverse osmosis – Purification of water for domestic use: use of chlorine, Ozone and UV light.

UNIT IV - PHASE RULE AND ADSORPTION

Phase rule- definition of terms involved. phase diagram of H_2O, Pb-Ag . Adsorption - Langmuir adsorption isotherms - Principles of chromatography (Paper, TLC and column).

UNIT V - ELECTROCHEMISTRY

Faradays laws of electrolysis - specific conductance, equivalent conductance - cell constant - Arrhenius theory Ostwald's dilution law and Kohlrausch law - Nernst equation - applications of EMF- measurements.

TEXT BOOK

Puri B.R., Sharma L.R., Kalia K.K., *Principles of Inorganic Chemistry*, Shobulal NaginChand & Co,2001.

REFERENCE

Bahl B.S. and Arun Bahl, A *text book of Organic Chemistry*, 21st Edition, Sultan Chand & Co., 2012.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UCY15462	CHEMISTRY PRACTICAL LAB - II	0	0	4	4	2

	INSTRUCTIONAL OBJECTIVE
	To enable the students to acquire the quantitative skills in volumetric analysis.
	At the end of the course, the students should be able to plan experimental projects and execute them.

ALLIED CHEMISTRY PRACTICALS

1. Estimation of $KMnO_4$ using standard Oxalic Acid
2. Estimation of $K_2Cr_2O_7$ using decinormal solution of Sodium thiosulphate solution
3. Estimation of Copper using decinormal solution of Potassium dichromate solution
4. Estimation of Nickel using decinormal solution of EDTA
5. Determination of Molecular Weight of a Polymer
6. Conductometric Titrations –I (HCl vsNaOH)
7. Conductometric Titrations- II (KClvs $AgNO_3$)
8. Potentiometric Titration (Redox Titrations)

TEXT BOOK

V. Venkateswaran, R. Veeraswamy, A.R. Kulandaivelu, *Basic Principles of Practical Chemistry,* Sultan Chand & Sons, Second edition-1997.

REFERENCE

N.S. Gnanapragasam and G. Ramamurthy, *Organic Chemistry – Lab Manual*, S. Viswanathan & Co. Pvt. Ltd., 1998.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
CDC15401	COMMUNICATION SKILLS	2	0	0	2	2

	INSTRUCTIONAL OBJECTIVES
1.	Communicate fluently
2.	Develop skills in listening, speaking, reading and writing

UNIT –I LISTENING SKILL

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

UNIT –II SPEAKING SKILL

Group communication- Features of an effective, fluent speech through regular practice- role-play, extempore-situational conversations-Greetings, requests, demands, instructions and enquiries.

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Informal speech- Facing audience-Body language- Conversion of mother tongue to English language, Formal speech-Paper presentation and essential aspects of Business communication.

UNIT-III READING SKILL

Reading Comprehension-Poems, passages- conversations, short messages, emails, formal/informal letters, Phonics, Speed Reading, Reading comprehension strategies.

UNIT-IV WRITING SKILL

Letter Writing- Formats and language- Types-Personal, Business, Applications, Thanks, Invitation, Condolence, Requests, Complaints-E-mail etiquette. Reports, Essay Writing.

UNIT-V

Interpersonal and intrapersonal communication- Ways to communicate in different scenarios- job interview, business meeting, project submission/proposal, informal gathering, speech for a large audience, a debate etc.- dress code, Eye contacts, body language and handshakes.

TEXT BOOK

1. Soft Skills- Know You and Know the World, Author-Dr.K.Alex.

BOOK FOR REFERENCE:

1. Communication Skills-Language in Use-Cambridge Edition.

SEMESTER V

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15501	REAL ANALYSIS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Be thorough with real and complex fields
2.	Be familiar with metric spaces
3.	Understand thoroughly the convergence of the sequences and series
4.	Get exposed to the limits of functions and in detail, derivatives of higher order theorems

UNIT I – REAL AND COMPLEX FIELD
Introduction- ordered sets - fields- real field - the extended real number system - the complex field-Euclidean spaces.

UNIT II – COUNTABLE AND UNCOUNTABLE SETS
Finite, countable and uncountable sets-metric spaces-compact sets-perfect sets-connected sets.

UNIT III – CONVERGENT SEQUENCES
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 – LIMIT AND CONTINUITY OF FUNCTION
Limits of functions – Continuous functions – Continuity and – Continuity and Connectedness – Monotonic Functions.

UNIT V - MEAN VALUE AND TAYLOR'S THEOREM
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, Major CoreGraw–Hill International Editions, Singapore, Reprint 2012.

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 TITLE	L	T	P	Total of LTP	C
UMA15502	ALGEBRAIC STRUCTURES	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Be familiar with group theory
2.	Be thorough with subgroups and quotient groups
3.	Study the characteristics of the rings and fields
4.	Study further Aspects of quotient rings and fields
5.	Be exposed to basic concepts of bases

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

UNIT II - HOMOMORPHISM
Normal subgroups and Quotient groups - Homomorphism - Automorphism.

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

UNIT IV – QUOTIENT RINGS
More Ideals and quotient rings – The field of quotients of an integral domain.

UNIT V - LINEAR INDEPENDENCE AND BASES

Elementary basic concepts - Linear independence and bases.

TEXT BOOKN. Herstein, Topics in Algebra, John Wiley & Sons, 2nd Edition, Reprint 2007.

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 TITLE	L	T	P	Total of LTP	C
UMA15503	OPERATIONS RESEARCH	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Solve LPP using different techniques
2.	Be familiar with the formulation of different types of problems
3.	Be exposed to queuing theory
4.	Be familiar with game theory
5.	Study PERT – CPM calculations

UNIT I - LINEAR PROGRAMMING PROBLEM

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

UNIT II - ASSIGNMENT PROBLEM

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

UNIT III – QUEUEING THEOREM

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 – GAME THEORY

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 – SCHEDULING PROBLEMS

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 BOOK

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

REFERENCES

1. Prof.V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan, Resource Management Techniques, A.R.Publications, 2012.
2. Prem Kumar Gupta D. S. Hira, Operations Research, 5th Edition, S. Chand & Company Ltd., Ram Nagar, New Delhi, 1998.
3. S.Dharani Venkata Krishnan, Operations Research Principles and Problems, Keerthi Publishing House PVT Ltd., 2005.

Course Code	Course Name	L	T	P	Total of LTP	C
UMA15504	C++ Programming - Lab	0	0	4	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 TITLE	L	T	P	Total of LTP	C
UES15501	ENVIRONMENTAL STUDIES	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	To gain knowledge on the importance of natural resources and energy.
2.	To understand the structure and function of an ecosystem.
3.	To imbibe an aesthetic value with respect to biodiversity, understand the threats and its conservation and appreciate the concept of interdependence
4.	To understand the causes of types of pollution and disaster management.
5.	To observe and discover the surrounding environment through field work.

UNIT I: INTRODUCTION TO NATURAL RESOURCES/ENERGY

Environmental Studies: Definition, scope, objectives and awareness- Introduction to natural resources: food, forest, water and energy – Renewable and non renewable resources-coal, oil, tidal, wind, geothermal, solar, biomass(over view) – nuclear fission and fusion-nuclear energy.

UNIT II: ECOSYSTEMS

Concept of an ecosystem-structure and function of an ecosystem-producers, consumers and decomposers- ecological succession-food chains(any 2 eg)- food webs(any 2 eg)-ecological pyramids.

UNIT III: BIODIVERSITY AND ITS CONSERVATION

Introduction, definition: genetic, species and ecosystem diversity-Values of biodiversity: consumptive, productive, social, ethical, aesthetic and option values hot spots of biodiversity-Threats to biodiversity: habitat loss, poaching of wildlife - endangered species and endemic species of India -conservation of biodiversity: in
–situ and ex-situ conservation of biodiversity.

UNIT IV: ENVIRONMENTAL POLLUTION /DISASTER MANAGEMENT

Definition-causes, effects and control measures of : Air, Water and Soil pollution- waste management- Disaster management: Natural and man made food/earthquake/cyclone, tsunami and landslides.

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENT

Sustainable development- Climate change: global warming, acid rain, ozone layer depletion and nuclear radiation- Environment Protection Act (any imp 2) air, water, wildlife and forest.

FIELD WORK

1. Students will visit any one of the following place of interest and submit a written report by the end of the semester:
2. Visit to a hospital/industry/canteen for solid waste management
3. Visit to a chemical industry to study about the practices followed there for waste disposal
4. Visit to Vandalur zoo for study of animal conservation/plants- flora and fauna
5. Study of simple ecosystems-lake/hill slopes
6. Naming the trees in the campus at SRM
7. Study of common plants, insects, birds in the neighborhood
8. Study of common diseases and their prevention
9. Optional: Street plays and rally for awareness of obesity/diabetes/ vitamin
D deficiency/health issues/ waste management/ solid waste management/
no plastics/ energy consumption/wild life protection.

TEXT BOOK

1. Sharma B.K. (2001). Environmental Chemistry. Goel Publ. House, Meerut
2. Jeyalakshmi R. (2014), Text book of Environmental Studies, Devi publications, Chennai.

BOOKS FOR REFERENCE

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. De A.K., Environmental Chemistry, Wiley Eastern Ltd.

e-BOOK

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India, Email:mapin@icenet.net (R)

SEMESTER VI

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15601	COMPLEX ANALYSIS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Grasp several facts on complex integration
2.	Get exposed to the harmonic functions and its properties
3.	Have sound knowledge in the derivatives of analytic functions
4.	Be familiar with singularities of different types and the corresponding theorems
5.	Be thorough with the evaluation of integrals of different types

UNIT I –ANALYTIC FUNCTION

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 - TRANSFORMATIONS

Mappings Conformal Mapping - The transformations $w = az+b$, $w = 1/z$, $w = z^2$, $w = \sqrt{z}$, $w = e^z$, Bilinear Transformation and special Bilinear Transformation.

UNIT III – CONTOUR INTEGRAL

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

UNIT IV TAYLOR'S AND LAURENT'S THEOREM

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

UNIT V EVALUTION OF INTEGRAL

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 BOOKS

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

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-Major CoreGraw Hill Edition, New Delhi. 2005.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15602	GRAPH THEORY	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	To introduce the students to the beautiful and elegant theory of graphs.
2.	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.
3.	To study and develop the concepts of graphs, subgraphs, trees connectivity, Eulerian and Hamiltonian graphs, matching colorings of graphs and planar graphs

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

TEXT BOOKS

S. Arumugam and S. Ramachandran, "Invitation to Graph Theory", SITECH Publications India Pvt. Ltd, Chennai – 17, 2006.

REFERENCES

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 TITLE	L	T	P	Total of LTP	C
UMA15603	MECHANICS	4	1	0	5	4

	INSTRUCTIONAL OBJECTIVES
1.	Understand in detail, simple harmonic motion
2.	Be familiar with the characteristic of elasticity
3.	Study, in detail, motion of a projectile
4.	Be familiar with central forces and orbit
5.	Be thorough with motion of a rigid body

UNIT I -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 - 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- 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 - 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 - 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 BOOKS

P. Durai Pandian, Mechanics, S. Chand & Company Ltd., 2012.

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	Total of LTP	C
UMA15604	Mathematical Software Practical - MATLAB	0	0	4	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 Major CoreGraw 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.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
CDC15601	PERSONALITY DEVELOPMENT	2	0	0	2	2
	INSTRUCTIONAL OBJECTIVES					
1.	Understand the concept of Personality Development					
2.	Summarize the principles of proper courtesy As practiced in the workplace					

UNIT – I

Introduction-Personality –Definition, Determinants of Personality-Personality Characteristics and Behavior at work-Big Five dimensions of Personality

UNIT – II

Personality Types- Sensation –Intuitive- Feelers & Thinkers category - Filling the GAP- Grooming, Attitude and Personality- Time management-Projective Personality Tests.

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UNIT –III

Introduction-Meaning and Definition of Ethics- Nature and objective of Ethics-Ethics and Morality – Ethics and Religion - Morals, Values and Ethics – Integrity – Work Ethic – Honesty – Courage –Empathy – Self-confidence – Character .

UNIT –IV

Ethical Theories – Classification- Basic Moral theories –Peace - Justice Ethical Decision Making - Structure - competence in professional ethics- How to use ethical reasoning-approaches and methods of resolving ethical dilemmas

UNIT –V

Development of Ethical corporate Behavior – Factors affecting managerial work -codes of ethics- Importance of attitudes in personal and professional lives.

TEXT BOOK

1. John R Boatright, (2003), "Ethics and the Conduct of Business", Pearson Education, New Delhi,.
2. Elizbeth Hurlock, (2007), Personality Development, Major CoreGraw Hill, 4th Edition,.

BOOKS FOR REFERENCE

1. Stephen P. Robins, (2012), Organisational Behavior, PHI Learning /Pearson Education, 15th edition,.
2. Subramaniam.R, (2013), Professional Ethics, Oxford Publication.

CORE BASED ELECTIVES

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E01	LINEAR ALGEBRA	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
1.	To learn about vector spaces.
2.	To have knowledge about linear independence and basis
3.	Be familiar about inner product spaces
4.	To learn about linear and nilpotent transformation

UNIT I

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

Unit II

Linear Independence – Dimension of a Vector space – Bases - Dimension of Quotient spaces.

UNIT III

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

UNIT IV

Linear Transformation – The Algebra of linear transformations – Characteristic roots – Matrices – Canonical forms – Triangular forms.

UNIT V

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

TEXT BOOK

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, New Delhi.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E02	FINANCIAL ACCOUNTING	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
1.	To learn about different types of accounts
2.	To have knowledge in single entry system
3.	To be familiar with hire purchase system
4.	To have thorough knowledge in partnership accounts

UNIT I

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

UNIT II

Single Entry System – Statement of affairs – Conversion Method.

UNIT III

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

UNIT IV

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

UNIT V

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.

REFERENCES

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, Major CoreGraw Hill Companies, UP.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E03	DYNAMICS	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
.1.	To understand about rectilinear motion
2.	To learn about motion of a projectile
3.	To have thorough knowledge about momentum
4.	To be exposed with planetary motion & moment of inertia

UNIT I

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

UNIT II

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

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

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

Moment of Inertia of simple bodies, Theorems 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.

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 Major CoreGraw Hill Edition, New Delhi.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E04	COST ACCOUNTANCY	4	0	0	4	4
	INSTRUCTIONAL OBJECTIVES					
1.	To have knowledge on scope and objective of cost accounting					
2.	To learn about various stock levels					
3.	To be familiar with labour cost and overheads					
4.	To have knowledge about process costing					

UNIT I

Cost accounting – meaning, scope, objectives - advantages and limitations – difference between cost accounting and financial accounting – elements of cost – preparation of cost sheet.

UNIT II

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

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

UNIT IV

Overheads – Classification – Apportionment Of Overheads – Redistribution Of Overheads – Absorption Of Overheads – Calculation Of Machine Hour Rate.

UNIT V

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, TheMajor CoreGraw Hill Companies, UP, 2007.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E05	ASTRONOMY	4	0	0	4	4
	INSTRUCTIONAL OBJECTIVES					
	This course aims to provide working knowledge about the universe.					

UNIT I

Celestial Sphere - Diurnal motion - Simple Problems (No derivation.)

UNIT II

Zones of Earth - Terrestrial Latitudes and Longitudes - Rotation of Earth - Dip of the horizon - Simple problems.(No derivation).

UNIT III
Twilight-simple problems-Astronomical refraction - Simple problems. (No derivation)

UNIT IV
Kepler's Laws - simple problems .(No derivation)

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

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

REFERENCES
1. V.Thiruvenkatacharya, A text book of Astronomy, Schand & Co. Pvt. Ltd., 1972.
2. H.Kartunen, Fundamental Astronomy, Content Technologies Publications, 2013.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E06	SEQUENCES AND SERIES	4	0	0	4	4

	INSTRUCTIONAL OBJECTIVES
1.	To learn about sequences
2.	To understand about infinite series
3.	To have thorough knowledge about alternative series
4.	To be familiar with summation of series

UNIT I
Sequence (definition) ,Limit, Convergence of a sequence- Cauchy‟s principle of convergence- Cauchy's first theorem on Limits-Bounded sequences –monotonic sequence always tends to a limit ,finite or infinite- Limit superior and Limit inferior .

UNIT II
Infinite series- Definition of Convergence, Divergence & Oscillation – Necessary condition for convergence –Convergence of and Geometric series. Comparison test , D„Alembert‟s ratio test , and Raabe‟s test .Simple problems based on above tests. p n1

UNIT III
Cauchy‟s condensation Test Cauchy‟s root test and their simple problems-Alternative series with simple problems

UNIT IV
Binomial Theorem for a rational index-Exponential & Logarithmic series-Summation of series & approximations using these theorems.

UNIT V
Summation of series including successive difference and recurring series.

TEXT BOOK
T.K. Manicavachagam Pillai, T. Natarajan, K.S. Ganapathy, Algebra, Vol. I, S. Viswanathan Pvt Limited, Chennai, 2004

REFERENCES
1. M.K.Singal &Asha Rani Singal, A first course in Real Analysis, R. Chand & Co., 1999
2. Dr.S.Arumugam, Sequences & Series, New Gamma Publishers, 1999.

SKILL BALLIED ELECTIVES

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E51	MATHEMATICS FOR COMPETITIVE EXAMINATION-I	3	0	0	3	3
	INSTRUCTIONAL OBJECTIVES					
	To introduce concepts of mathematics with emphasis on analytical ability & computational skill needed in competitive examinations					

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

Unit II
Simplification, Square roots and Cube Roots, Average.

Unit III
Problems on numbers, problems on Ages.

Unit IV
Surds and Indices, Percentage, Profit and Loss.

Unit V
Ratio and Proportion, Partership.

TEXT BOOK
R.S.Aggarwal, Quantitative Aptitude for competitive Examination, S.Chand and Company Ltd, 152, AnnAsalai,Chennai, 2012.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E52	FINANCIAL MATHEMATICS	3	0	0	3	3
	INSTRUCTIONAL OBJECTIVES					
1.	To have knowledge about probability					
2.	To learn about Brownian motion					
3.	To be familiar with Arbitrage theorem					
4.	To have knowledge in pricing, estimating and expected utility					

UNIT I
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
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
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
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
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 BOOKS
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	Total of LTP	C
UMA15E53	NUMBER THEORY	3	0	0	3	3

	INSTRUCTIONAL OBJECTIVES
1.	To learn about division algorithm
2.	To have knowledge about fundamental theorem of arithmetic
3.	To be familiar with linear congruences
4.	To have knowledge in Mobius inversion formula and Euler's theorem

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

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

1. T.M.Apostol, Introduction to Analytic Number Theory, Springer Valley, 1976.
2. Kumaravelu and Suseela Kumaravelu, Number Theory, SKV Publications, 2002.
3. ennath& Rosen, Elementary number theory & its applications, Addison Wesley Publishing Co. Ltd., 1968.
4. George E, Andrea, Number Theory, Hindustan Publishing, 1989.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E54	MATHEMATICS FOR COMPETITIVE EXAMINATION - II	3	0	0	3	3

	INSTRUCTIONAL OBJECTIVES
	To introduce concepts of mathematics with emphasis on analytical ability & computational skill needed in competitive examinations

UNIT I

Chain rule – time and work.

UNIT II

Problems on time and distance.

UNIT III

Problems on trains.

UNIT IV

Problems on Boats and streams.

UNIT V

Alligation or mixture.

TEXT BOOK

R.S.Aggarwal, Quantitative aptitude for competitive examinations, S.Chand and Co Ltd,152, Anna salai, Chennai, 2001

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E55	COMBINATORICS	3	0	0	3	3

	INSTRUCTIONAL OBJECTIVES
1.	To learn about recurrence relation
2.	To have knowledge about permutation
3.	To be familiar with Assignment problems
4.	To have knowledge in Fibonacci relation and exclusion principle

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

The inclusion – Exclusion principle - Rook polynomial.

TEXT BOOKS

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

REFERENCES

1. V.K.Balakrishnan, Combinatorics, Schuam Series, 1996.
2. Russell Merris, Combinatorics, John Wiley & Sons, 2003.

COURSE CODE	COURSE TITLE	L	T	P	Total of LTP	C
UMA15E56	FUZZY MATHEMATICS	3	0	0	3	3

	INSTRUCTIONAL OBJECTIVES
1.	To know the basic definitions of fuzzy set theory.
2.	To know the fundamentals of fuzzy Algebra
3.	To know the applications of fuzzy Technology

UNIT I

Introduction- Fuzzy subsets-Lattices and Boolean Algebras- L fuzzy sets-operations on fuzzy – level sets – properties of fuzzy subsets.

UNIT II

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

UNIT III

Introduction- Algebra of fuzzy relations-logic-connectives.

UNIT IV

Some more connectives-Introduction-fuzzy subgroup-homomorphic image and Pre-image of sub groupoid.

UNIT V

Fuzzy invariant subgroups-fuzzy subrings.

TEXT BOOK

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

REFERENCES

1. M.Ganesh, Introduction to Fuzzy Sets & Fuzzy Logic, Prentice Hall of India Pvt. Ltd., 2006.
2. John N.Mordeson and Pre Major Corehand S.Nair, Fuzzy Mathematics, Spring verlong, 2001.