

BHARATHIAR UNIVERSITY::COIMBATORE-641 046
B. Sc. MATHEMATICS DEGREE COURSE - CBCS PATTERN
(For the students admitted from the academic year **2018-2019** and onwards)
Scheme of Examination

Part	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur.hr	CIA	Marks	Total Marks	
	Semester I							
I	Language – I		6	3	25	75	100	4
II	English – I		6	3	25	75	100	4
III	Core Paper I - Classical Algebra		4	3	25	75	100	4
III	Core Paper II-Calculus		5	3	25	75	100	4
III	Allied A : Paper I Chosen by the college		7	3	25	75	100	4
IV	Environmental Studies #		2	3	-	50	50	2
	Semester II							
I	Language – II		6	3	25	75	100	4
II	English – II		6	3	25	75	100	4
III	Core Paper III Analytical Geometry		4	3	25	75	100	4
III	Core Paper IV- Trigonometry, Vector Calculus and Fourier Series		5	3	25	75	100	4
III	Allied A: Paper II Chosen by the college		7	3	25	75	100	4
IV	Value Education – Human Rights #		2	3	-	50	50	2
	Semester III							
I	Language – III		6	3	25	75	100	4
II	English – III		6	3	25	75	100	4
III	Core Paper V- Differential Equations and Laplace Transforms		3	3	25	75	100	4
III	Core Paper VI- Statics		3	3	25	75	100	4
III	Allied B - Paper III Chosen by the college		7	3	20	55	75	3
IV	Skill based Subject - Operations Research -I		3	3	20	55	75	3
IV	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women’s Rights#		2	3	50		50	2

	Semester IV						
I	Language – IV	6	3	25	75	100	4
II	English – IV	6	3	25	75	100	4
III	Core Paper VII-Dynamics	3	3	25	75	100	4
III	Core Paper VIII- Programming in C	3	3	**	**	100**	4
III	Allied B : Paper II – Chosen by the college	5	3	20	55	75	3
III	Practical - (Allied)	2	3	20	30	50	2
IV	Skill based Subject - Operations Research – Paper II	3	3	20	55	75	3
IV	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	3	50		50	2
	Semester V						
III	Core Paper IX-Real Analysis-I	5	3	25	75	100	4
III	Core Paper X- Complex Analysis-I	6	3	25	75	100	4
III	Core Paper XI- Modern Algebra-I	6	3	25	75	100	4
III	Core Paper XII- Discrete Mathematics	5	3	25	75	100	4
III	Elective I	5	3	20	55	75	3
IV	Skill based Subject - Operations Research Paper III	3	3	20	55	75	3
	Semester VI						
III	Core Paper XIII Real Analysis-II	5	3	25	75	100	4
III	Core Paper XIV Complex Analysis-II	6	3	25	75	100	4
III	Core Paper XV Modern Algebra-II	6	3	25	75	100	4
III	Elective II	5	3	20	55	75	3
III	Elective III	5	3	**	**	100**	4
IV	Skill Based Subject - Operations Research paper IV	3	3	20	55	75	3
V	Extension Activities @	-		50	-	50	2
	Total					3500	140

** All Computer papers have theory and practical exams.	Theory			20	55	100	
				10	15		

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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Allied subjects : 1.Physics, 2.Chemistry, 3.Accountancy & 4.Statistics.

List of Elective papers (Colleges can choose any one of the paper as electives)		
Elective – I	A	Astronomy- I
	B	Numerical Methods-I
Elective – II	A	Astronomy- II
	B	Numerical Methods-II
Elective - III	A	Graph Theory
	B	Automata Theory & Formal Languages
	C	Programming in C++ **

SEMESTER-I

BHARATHIAR UNIVERSITY, COIMBATORE-641 046.
UNDER GRADUATE DEGREE PROGRAMMES (CBCS Semester Pattern)
(For the students admitted during the academic year 2017 -2018 onwards)

பாடத்திட்டம் - முதற்பருவம் - பகுதி - I - தாள் - I
(2017-2018ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது)
(செய்யுள், சிறுகதை, இலக்கிய வரலாறு, இலக்கணம், மொழிபெயர்ப்பு)

அலகு - I

1. பாரதியார் - புதுமைப் பெண்
2. பாரதிதாசன் - அழகின் சிரிப்பு - தமிழ்
3. கண்ணதாசன் - காலக்கணிதம்
4. சுரதா - சிக்கனம்
5. காசி ஆனந்தன் - பெருமூச்சு
6. இன்துலாப் - மனுசங்கடா நாங்க மனுசங்கடா

அலகு - II

7. அப்துல் ரகுமான் - ஒப்பில்லாத சமுதாயம்
8. அறிவுமதி - நட்புக்காலம்
9. நா.முத்துக்குமார் - அக்காவின் கடிதம்
10. தாமரை - ஒரு கதவும் கொஞ்சம் கள்ளிப்பாலும்
11. ஈரோடு தமிழன்பன் - ஹைகூக் கவிதைகள் (10 கவிதைகள்)
12. நாட்டுப்புறப் பாடல்கள் - தெம்மாங்கு பாடல், தொழில் பாடல்

அலகு - III

❖ புதுமைப்பித்தன் முதல் இறையன்பு வரை -சிறுகதைத் தொகுப்பு -NCBH,வெளியீடு.

அலகு - IV - இலக்கிய வரலாறு

- ❖ புதுக்கவிதை, ஹைகூக் கவிதை - தோற்றமும் வளர்ச்சியும்
- ❖ படிமம், குறியீடுகள் - பற்றிய விளக்கங்கள்.
- ❖ சிறுகதையின் தோற்றமும் வளர்ச்சியும்.

இலக்கணம் :

1. மொழித்திறன், சொற்பொருள் வேறுபாடு, ர,ற,ல,ள,ழ,ந,ண,ன வேறுபடுத்தி அறியும் முறை.
2. தொடரில் வழுஉச் சொற்களை நீக்கி எழுதுதல், மரபுப் பிழையை நீக்கி எழுதுதல்
3. உண்டு, உள, உளது, அன்று, அல்ல, அல்லன், அல்லர் பயன்பாடு ஓர், ஒரு பயன்பாடு
4. ஒருமை, பன்மை தொடரில் அமையும் விதம்.

அலகு - V - மொழிபெயர்ப்புப் பகுதி

பொதுப்பகுதி, அலுவலகப் பகுதி, ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல்.

BHARATHIAR UNIVERSITY : COIMBATORE – 641 046

Part I – Hindi Language

For Under-graduate Degree Programmes

(For the students admitted during 2017-2018 onwards)

FIRST SEMESTER – Paper I

(Prose, Non-detailed, Grammar & Translation, Comprehension)

1. PROSE : NUTHAN GADYA SANGRAH

Editor : Jayaprakash
(Prescribed Lessons – only 6)
Lesson 1 – Bharathiya Sanskurthi
Lesson 3 – Razia
Lesson 4 – Makreal
Lesson 5 – Balhtha Pani Nirmala.
Lesson 6 – Rashtrapitha Mahathma Gandhi
Lesson 9 – Ninda Ras.

Publisher : Sumitra Prakashan
Sumitravas, 16/4, Hastings Road,
Allahabad – 211 001.

2. NON DETAILED TEXT : KAHANI KUNJ

Editor : Dr. V.P. Amithab.
(Stories 1-6 only)
Publisher : Govind Prakashan
Sadhar Bagaar, Mathura,
Uttar Pradesh – 281 001.

3. GRAMMAR : SHABDHA VICHAR ONLY

(NOUN, PRONOUN, ADJECTIVE, VERB, TENSE, CASE ENDINGS)
Theoretical & Applied.

Book for Reference : Vyakaran Pradeep by Ramdev
Publisher : Hindi Bhavan,
36, Tagore Town
Allahabad – 211 002.

4. TRANSLATION : English – Hindi only.

ANUVADH ABHYAS – III
(1-15 lessons only)

Publisher : DAKSHIN BHARAT HINDI PRACHAR SABHA
CHENNAI – 17.

5. COMPREHENSION : 1 Passage from ANUVADH ABHYAS – III (16-30)
DAKSHIN BHARATH HINDI PRACHAR SABHA
CHENNAI-17.

BHARATHIAR UNIVERSITY, COIMBATORE-641 046

PART – I – FRENCH

(For the students admitted during the academic year 2018-2019 and onwards)

UG - REGULAR & NIFT

(From 2018-2019 onwards)

(For all BA/B.Sc/B.Com/B.Com CA/BBM / NIFT courses)

	SEMESTER I	PAPER I
Prescribed text	: LATITUDES I	
Units	: 1 – 4	
Authors	: Régine Mérieux Yves Loiseau	
Available at	: Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 110007	
Tel	: 011 – 23852986 / 9650597000	

BHARATHIAR UNIVERSITY – COIMBATORE

PART II – ENGLISH

Semester I

(For the students admitted from the academic year 2018-19 and onwards)

Prescribed Text: **PEARL STRING**

Board of Editors

Publishers: Emerald publishers

Unit I

Poetry

1. The Solitary Reaper – William Wordsworth
2. Gift – Alice Walker
3. Ode to the Westwind – P.B.Shelly

Unit II

Prose

1. The Refugee – K.A.Abbas
2. The Lady or the Tiger – Frank R. Stockton
3. The Sky is the Limit – Kalpana Chawla

Unit III

Short Stories

1. The Fortune Teller – Karel Capek
2. The Postmaster – Rabindranath Tagore
3. The Model Millionaire – Oscar Wilde

Unit IV

One Act Plays

1. The Death Trap – H.H.Munro
2. The Anniversary – Anton Chekov

Unit V

Grammar and Composition

1. Parts of Speech
2. Articles
3. Prepositions
4. Note Making
5. Jumbled Sentences
6. Welcome Address
7. Vote of Thanks

Ac

Annexure No.	20 G
SCAA Dated	29.02.2008

BHARATHIAR UNIVERSITY, COIMBATORE
(For the students admitted from 2008 – 2009 onwards)
ALLIED PAPER-I
(For B.Sc Mathematics /Mathematics (C.A))

Subject title: Statistics for Mathematics-I

Course number: _____ **Number of credit hours:7(SEVEN)**

Subject description: This course introduces Statistical concepts and mathematical analysis.

Goal: To enable the students to understand mathematical aspects of statistics

Objective: on successful completion of the paper the students should have understood the concepts of probability, random variable, various discrete and continuous probability distributions and the concepts of correlation and regression.

UNIT-I

Random variables- discrete and continuous random variables –distribution function- properties- probability mass function, probability density function-mathematical expectation – addition and multiplication theorems on expectations

UNIT II

Moment generating and cumulating generating & characteristic functions and their properties.

Joint probability distributions-marginal and conditional probability distributions-independence of random variables-transformation of variables (one & two dimensional only).Tchebychev's inequality, weak law of large numbers and central limit theorem

UNIT III

Probability distributions: Binomial, Poisson and Normal distributions and their properties and fitting of distributions. Chi-square, t and F Statistics, their probability functions and their properties.

UNIT IV

Curve fitting and principle of least squares: fitting of curves of straight line, second degree parabola, power curve and exponential curves-correlation and regression analysis.

UNIT-IV

Simple problems related to the above units.

Books recommended for study:

1. Fundamentals of Mathematical statistics by Guptha, S.C &Kapoor, V.K
2. Introduction to Statistical methods by Guptha ,C.B and Vijay Guptha (1988)

Semester: I - Core Paper- I
Subject Title: Classical Algebra

Credit hours-4

Subject description: This course focuses on the convergence and divergence of different types of series, also discusses the standard methods of solving both polynomial and transcendental type equations.

Goal: To enable the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equation.

Objectives: On successful completion of this course the students should gain knowledge about the convergence of series and solving equations.

UNIT I: Binomial & exponential theorems (statements only) - their immediate application to summation and approximation only

UNIT II:

Logarithmic series theorem-statement and proof-immediate application to summation and approximation only. Convergency and divergency of series –definitions, elementary results-comparison tests-De Alemberts and Cauchy’s tests.

UNIT III:

Absolute convergence-series of positive terms-Cauchy’s condensation test-Raabe’s test.

UNIT: IV

Theory of equations: Roots of an equation- Relations connecting the roots and coefficients- transformations of equations-character and position of roots-Descarte’s rule of signs-symmetric function of roots-Reciprocal equations.

UNIT V:

Multiple roots-Rolle’s theorem - position of real roots of $f(x) = 0$ - Newton’s method of approximation to a root - Horner’s method.

Treatment as in

Algebra-T.K .Manicavachasam Pillai, T.Natarajan, K-S Canapathy.
S. Viswanatham (Printers & Publishers Private Ltd-2006)

References:

1. Mathematics for B.Sc. Branch I -Vol. I- P. Kandasamy and K. Thilagavathy
(For B.Sc-I semester) S. Chand and Company Ltd, New Delhi, 2004.
2. Algebra. -- N.P.Bali- Laxmi publications

Core Paper- II
Subject Title : CALCULUS

credit hours-5

Subject description:

This course presents the idea of curvatures, integration of different types of functions, its geometrical applications, double, triple integrals and improper integrals.

Goal:

To enable the students to learn and gain knowledge about curvatures, integrations and its geometrical applications.

Objectives:

On successful completion of course the students should have gain about the evolutes and envelopes, different types of integrations, its geometrical application, proper and improper integration.

UNIT I:

Curvature-radius of curvature in Cartesian and polar forms-evolutes and envelopes- pedal equations- total differentiation- Euler's theorem on homogeneous functions.

UNIT II:

Integration of $f'(x)/f(x)$, $f'(x)\sqrt{f(x)}$, $(px+q)/\sqrt{(ax^2+bx+c)}$, $[\sqrt{(x-a)/(b-x)}]$, $[\sqrt{(x-a)(b-x)}]$, $1/[\sqrt{(x-a)(b-x)}]$, $1/(\cos x + b \sin x + c)$, $1/(\cos^2 x + b \sin^2 x + c)$, Integration by parts

UNIT III:

Reduction formulae- problems- evaluation of double and triple integrals- applications to calculations of areas and volumes-areas in polar coordinates.

UNIT IV:

Change of order of integration in double integral- Jacobians.- change of variables in double and triple integrals.

UNIT V: Beta and Gamma integrals-their properties, relation between them- evaluation of multiple integrals using Beta and Gamma functions

Treatment as in

1. Calculus vol 1 and vol 2"-- S. Narayanan and T.K.M. Pillai. Viswanathan Publishers

References:

1. Mathematics for BSc – Vol I and. II - P. Kandasamy & K.Thilagarathy S.Chand and Co-2004
2. A Text book of calculus- Shanthi Narayanan & J.N.Kapoor, S.Chand & Co.

SEMESTER- II

BHARATHIAR UNIVERSITY, COIMBATORE-641 046.
UNDER GRADUATE DEGREE PROGRAMMES (CBCS Semester Pattern)
(For the students admitted during the academic year 2017 -2018 onwards)
பாடத்திட்டம் - இரண்டாம் பருவம் - பகுதி - I - தாள் - II
(2017-2018ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது)
(செய்யுள், உரைநடை, இலக்கிய வரலாறு, விண்ணப்பம் வரைதல்)

அலகு - I

- 1.திருக்குறள் (மூன்று அதிகாரங்கள்)
அ.அன்புடைமை
ஆ.அறிவுடைமை
இ.பிரிவாற்றாமை
- 2.சிறுபஞ்சமூலம் - 11-20 பாடல்கள் (10 பாடல்கள்)
- 3.பழமொழி நானூறு - முயற்சி - முதல் 10 பாடல்கள்

அலகு - II

1. நந்திக் கலம்பகம்
2. திருப்பாவை, திருவெம்பாவை
3. சித்தர் பாடல்கள்

அலகு - III - உரைநடைத் திரட்டு -NCBH, வெளியீடு.

1. சங்கச் சான்றோர்களின் ஆளுமைப் பண்புகள் - பேரா.இரா.மோகன்
2. உருவ ஊன்று பாத்திரங்கள் - முனைவர் கா.மீனாட்சிசுந்தரம்
3. திருக்குறளும் தந்தை பெரியாரும் - பேரா.க.பஞ்சாங்கம்
4. இயற்கையும் மனிதனும் - முனைவர் க.சிவமணி
5. பாட்டு ஆட்டங்கள் - ஆறு.இராமநாதன்

அலகு - IV

1. வல்லினம் மிகும் இடம் - மிகா இடம்
2. வினா விடை வகைகள் - (அறுவகை வினா, எண்வகை விடை)
3. ஆகுபெயர் விளக்கம் - பயன்பாடு வகைகள் 10.

அலகு - V - இலக்கிய வரலாறு பாடத்திட்டத்தைத் தழுவிவது.

1. பதினெண் கீழ்க்கணக்கு நூல்கள்
2. தமிழ் உரைநடையின் தோற்றமும் - வளர்ச்சியும்

பயிற்சிக்குரியன

3. விண்ணப்பங்கள், மடல்கள் எழுதச் செய்தல்.

BHARATHIAR UNIVERSITY, COIMBATORE-641 046

PART – I – FRENCH

(For the students admitted during the academic year 2018-2019 and onwards)

UG - REGULAR & NIFT

(From 2018-2019 onwards)

(For all BA/B.Sc./B.Com/B.Com CA/BBM / NIFT courses)

	SEMESTER II	PAPER II
Prescribed text	: LATITUDES I	
Units	: 5 – 8	
Authors	: Régine Mérieux Yves Loiseau	
Available at	: Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar)	

Tel : New Delhi – 110007
: 011 – 23852986 / 9650597000

SECOND SEMESTER – PAPER II

(Modern Poetry, One Act Play, Translation & Letter Writing, Conversation)

1. MODERN POETRY : BHOOMIJA by NAGARJUN

Publishers : Rajkamal Prakashan
1B Nethaji Subash Marg,
New Delhi.

2. ONE ACT PLAY : NAVEEN EKANKI SANGRAH
By Dr. Smt. MALATI THIVARI
SUMITHRA PRAKASHAN
ASHOK NAGAR
ALLAHABAD – 1.

Activate Windows
Go to Settings to activate Windows

3. TRANSLATION : HINDI-ENGLISH ONLY
(ANUVADH ABYAS-III)
Lessons – 1-15 only

PUBLISHER : DAKSHIN BHARATH HINDI PRACHAR SABHA
CHENNAI – 600 017.

4. LETTER WRITING : (Leave Letter, Job Application, Ordering Books, Letter
to Publisher, Personal Letter)

5. CONVERSATION : (Doctor & Patient, Teacher & Student, Storekeeper & Buyer,
Two Friends, Booking Clerk & Passenger at Railway Station,
Autorickshaw driver and Passenger)
Ref : Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan
Vani Prakashan, New Delhi.

Part II English-Semester II

Prescribed Text: **SNOW FLAKES**

Board of Editors

Publishers: Harrows Publications Jains Ashraya, Phase I FB, I Block, Vembuli Amman Kovil Street, Virugambakkam, Chennai-92.

Unit I

Poetry

1. Let Me not to the Marriage of true minds - Shakespeare

2. Stopping by woods on a Snowy Evening –Robert Frost

3.The Lotus – Toru Dutt

Unit II

Prose

1. My Greatest Olympic Prize – Jesse Owens

2. Early Influence - Dr.A.P.J.Abdul Kalam

3. On Keyhole Morals - A.G.Gardiner

Unit III

Short Stories

1. The Selfish Giant – Oscar Wilde

2. Tree Speaks – C.Rajagopalachari

3. The Diamond Necklace - Guy De Maupassant

Unit IV

Biography

Abraham Lincoln – James Russel Lowell

Indira Gandhi – Papul Jayakar

Unit V

Grammar & Composition

1. Sentence Pattern

2.Kinds of Sentences

3.Voice

4.Reported Speech

5. Letter Writing (Formal & Informal)

6. Writing Cover Letter & Resume Writing.

Question Paper Pattern: Existing Pattern is to be followed.

ALLIED PAPER-II
(For B.Sc Mathematics /Mathematics (C.A))

Subject title: Statistics for mathematics-II

course number:

Number of credit hours: 7 (Seven)

Subject description: This paper introduces Applied Statistical concepts and mathematical analysis.

Goal: To enable the students to understand mathematical aspects of applied statistics

Objective: on successful completion of the paper the students should have understood the concepts of estimation ,testing ,sampling, design of experiments

UNIT-I

Concept of population, sample, statistics, parameter-point estimation-concept of point estimation - consistency, unbiased ness, efficiency- sufficiency-Neyman factorization theorem- Cramer Rao inequality -Rao-Blackwell theorem.

UNIT-II

Methods of estimation-maximum likelihood, moments, and minimum chi-square –properties- interval estimation –confidence interval-derivation of confidence intervals based normal, t, and chi-square and F.

UNIT-III:

Test of hypothesis: Type-I error and II errors-power test –Neyman-Pearson Lemma-likelihood ratio tests-concept of most powerful test (statements and results only).

Test of significance-standard error-large sample tests with respect to mean, standard deviation, proportion, difference between means, standard deviations and proportions-exact tests based on t, chi-square and F distributions.

UNIT-IV

Sampling from finite population-simple random sampling, stratified random sampling and systematic sampling-estimation of mean, total and their standard errors. Sampling and non-sampling errors (concepts only). Analysis of variance: one way, two classifications -fundamental principles of experimentation-CRD, RBD and LSD.

UNIT-V.

Simple problems related to all the above units.

Books recommended for study:

1. Fundamentals mathematical Statistics by Guptha, S.C & Kapoor, V.K
2. Fundamentals of Applied statistics by Guptha, S.C& Kapoor, V.K

**Semester: II -
Core Paper- III**

Subject Title: Analytical Geometry

Credit hours-4

Subject Description:

This course gives emphasis to enhance student knowledge in two dimensional and three dimensional analytical geometry. Particularly about two dimensional conic sections in polar coordinates and the geometrical aspects of three dimensional figs, viz, sphere, cone and cylinder.

Goal:

To enable the students to learn and visualize the fundamental ideas about co-ordinate geometry.

Objectives:

On successful completion of the course students should have gained knowledge above the regular geometrical figures and their properties.

UNIT I:

Analytical geometry of 2D-polar coordinates equation of a conic -directrix-chord-tangent-normal- simple problems - only in deriving equation of a conic.

UNIT II:

Analytical Geometry 3D-straight.lines-coplanarity 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

Treatment as in

1. Analytical Geometry by P. Durai Pandian & others
2. Solid Geometry by N.P. Bali- Laxmi Publications (P) Ltd

References:

1. Analytical Geometry of 2D by T.K. M. Pillai and Others – Visvanathan Publications- 2006
2. Solid Geometry by M.L. Khanna- Jainath & Co Publishers, Meerut

Core Paper – IV
Subject Title : Trigonometry, Vector Calculus and Fourier Series
Credit Hours: 5

Subject Description : This course presents the circular functions, hyperbolic functions, differentiation of functions in scalar and vector field.

Goals: To enable the students to learn about the expansion of trigonometrical functions and to gain knowledge about vector calculus which will help them to solve the analytical geometry problems.

Objectives: On successful completion of this course, the students should have gained knowledge about expansion of trigonometric functions, line integral, surface integral, volume integral and Fourier series.

Unit I:

Expansion in Series – Expansion of $\cos^n \theta$, $\sin^n \theta$, in a series of cosines and sines of multiples of θ – Expansions of $\cos n\theta$ and $\sin n\theta$ in powers of sines and cosines – Expansion of $\sin \theta$, $\cos \theta$ and $\tan \theta$ in powers of θ – hyperbolic functions and inverse hyperbolic functions.

Unit II:

Logarithm of complex quantities - summation of series – when angles are in arithmetic progression – $C + iS$ method of summation – method of differences.

Unit III:

Scalar and vector fields –Differentiation of vectors – Gradient, Divergence and Curl.

Unit IV:

Integration of vectors – line integral – surface integral – Green's theorem in the plane – Gauss divergence theorem – Strokes theorem – (Statements only) - verification of the above said theorems.

Unit V:

Periodic functions – Fourier series of periodicity 2π – half range series.

Treatment as in

1. Kandasamy. P, Thilagavathi. K “ Mathematics for B.Sc. Branch I”, Volume I, II and IV, S.Chand and Company Ltd, New Delhi, 2004. (for Unit I).

References:

1. P. Duraipandian, Laxmiduraipandian - Vector Analysis (Revised Edition-Reprint 2005) Emerald Publishers.

2. T.K. Manichavasagam Pillai and S.Narayanan, Trigonometry - Viswanathan Publishers and Printers Pvt. Ltd.

SEMESTER III

பாடத்திட்டம் - மூன்றாம் பருவம் - பகுதி - I - தாள் - III

(2017-2018ஆம் கல்வியாண்டு முதல் ஷேவ்வார்க்குரியது)

(செய்யுள், புதினம், இலக்கணம், இலக்கிய வரலாறு, பயிற்சி கட்டுரை)

பொருளடக்கம்

- அலகு 1
1. சிலப்பதிகாரம் - கனாத்திறமுரைத்த காதை
 2. மணிமேகலை - பீடிகை கண்டு பிறப்புணர்த்திய காதை
 3. சீவகசிந்தாமணி - விமலையார் இலம்பகம் (1889 முதல் 1941 முடிய)
- அலகு 2
1. கம்பராமாயணம் - குகப்படலம் (கங்கை காண் படலம்)
 2. பெரியபுராணம் - அப்பூதியடிகள் புராணம்
 3. தேம்பாவணி - வளன் சனித்த படலம் (167 முதல் 200 முடிய)
- அலகு 3
- புதினம் சீத்தம்மா - ஆசிரியர் : பட்சி
நியூ செஞ்சுரி புக ஹவுஸ்
சென்னை
- அலகு 4
- பா - அணியிலக்கணம் (பாடப்பகுதியை ஒட்டியவை)
- 1.நிலைமண்டில ஆசிரியப்பா. அறுசீர்க்கழிநெடிலடி ஆசிரிய விருத்தம்,
கலிவிருத்தம்
 - 2.உவமையணி, பண்புபயன், தொழில் உவமைகள்
 - 3.உருவக அணி
 - 4.தற்குறிப்பேற்ற அணி , 5. இல்பொருள் உவமை அணி
- அலகு 5
- இலக்கிய வரலாறு
- 1.ஐம்பெருங்காப்பியங்கள், புதினத்தின் தோற்றமும் வளர்ச்சியும்
புதினங்களின் வகைகள்- விளக்கம்
 2. பொதுக்கட்டுரை

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BHARATHIAR UNIVERSITY, COIMBATORE

PART-I, PAPER-III, FRENCH
(COMMON FOR ALL U.G. COURSES)
SYLLABUS - UNDER CBCS – AFFILIATED COLLEGES
[with effect from 2014-2015]

SEMESTER- III

PAPER III

Prescribed text	: ALORS II
Units	: 1 – 5
Authors	: Marcella Di Giura Jean-Claude Beacco
Available at	: Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 110007.
Tel	: 011 – 23852986 / 9650597000

BHARATHIAR UNIVERSITY : COIMBATORE – 641 046

**Part I – Hindi Language
For Under-graduate Degree Programmes
(For the Students admitted during 2016-2017 onwards)**

THIRD SEMESTER – PAPER III

(Poetry, History of Hindi Literature, Alankar and Translation)

1. POETRY: KAVYA LEHAR – by

Dr.V. Baskhar

Puplisher: Jawahar Pusthakalay

Sadar Bazaar,

Mathura – U.P. 281 001.

SHORT NOTES ON POETS – All the Poets mentioned in the Text Book.

2. HISTORY OF HINDI LITERATURE:

Only Aadi Kaal and Bhakthi Kaal. Only a general knowledge
of the trends of the difference streams.

3. ALANKAR: Anupras, Yamak, Slesh, Vakrokthi Upama, Rupak, Drishtanth &
Virodhabas.

4. TRANSLATION : ENGLISH - HINDI only

ANUVADH ABHYAS – III

(16-30 Lessons only)

REFERENCE BOOKS: HINDI SAHITHYA KA SARAL ITHIHASS

By Rajnath Sharma,

VINOD PUSTAK MANDIR,

AGRA – 282 002.

Kavya Pradeep

Rambadri Shukla,

Hindi Bhavan, 36, Tagore Town,

Allahabad – 211 002.

Anuvadh ABYAS-III

Dakshin Bharath Hindi Prachar Sabha,

Chennai – 17.

BHARATHIAR UNIVERSITY – COIMBATORE

PART II – ENGLISH

Semester I

(For the students admitted from the academic year 2018-19 and onwards)

Part II English-Semester III

(For the students admitted from the academic year 2018-19 and onwards)

Prescribed Text: **DEW DROPS**

Board of Editors

Publishers: New Century Book House(p)Ltd., 41B,SIDCO Industrial Estate Chennai-98.

Unit I

Poetry

1. Ulysess – Alfred Tennyson
2. O Captain! My Captain! – Walt Whitman
3. The Unknown Citizen – W.H.Auden

Unit II

Prose

1. Sweet for Angels – R.K.Narayan
2. My Lost Dollar – Stephen Leacock
3. The Loss of the Titanic – Lawrence Beesley

Unit III

Short Stories

1. Orpheus and Eurydice – Rev. G.W.Cox
2. At the Church Door – Guy De Maupassant
3. How much Land does a Man need? – Leo Tolstoy

Unit IV

Autobiography

1. My Experiments with Truth - M.K.Gandhi
2. I am Malala - Malala

Unit V

Grammar & Composition

1. Modals
2. Concord
3. Dialogue Writing
4. E-Mail
5. Report Writing

Annexure No.	57 D
SCAA Dated	29.02.2008

BHARATHIAR UNIVERSITY :: COIMBATORE – 641 046.

ALLIED PAPER – ACCOUNTANCY – I FOR B.Sc., MATHEMATICS
(for the students admitted from the academic year 2007-2008 and onwards)

Subject Title: PRINCIPLES OF ACCOUNTANCY I

Course/Subject code: **Credit Hours: 5 (Five) per week**

Goal: To enable the students to learn principles and concepts of Accountancy.

Objective: On successful completion of this course, the student should have understood

- Concepts and conventions of Accounting.
- Basic Accounting framework

UNIT –I

Fundamentals of Book Keeping – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books – Trial balance.

UNIT – II

Final accounts of a sole trader with adjustments – Errors and rectification

UNIT – III

Bills of exchange- Accommodation bills – Average due date – Account current.

UNIT – IV

Accounting for consignments and Joint ventures

UNIT – V

Bank Reconciliation statement – Receipts and Payments and income and expenditure account and Balance sheet – Accounts of professionals.

Note : Distribution of Marks between problems and theory shall be 80% and 20%.

REFERENCE BOOKS

1. N.Vinayakam, P.L.Mani, K.L.Nagarajan – *Principles of Accountancy* – S.Chand & Company Ltd.,
2. T.S.Grewal – *Introduction to Accountancy*- S.Chand & Company Ltd.,
3. R.L.Gupta, V.K.Gupta, M.C.Shukla – *Financial Accounting* – Sultanchand & sons
4. T.S.Grewal, S.C.Gupta, S.P.Jain – *Advanced Accountancy*- Sultanchand & sons
5. K.L.Narang, S.N.Maheswari - *Advanced Accountancy*-Kalyani publishers
6. S.K.Maheswari, T.S.Reddy - *Advanced Accountancy*-Vikas publishers
7. A.Murthy -*Financial Accounting* – Margham Publishers
8. P.C.Tulsian - *Advanced Accountancy* – Tata McGraw Hill Companies.
9. A.Mukherjee, M.Hanif – *Modern Accountancy. Vol.1*- Tata McGraw Hill Companies

Semester: III
Core paper V

Subject Title: Differential Equations and Laplace Transforms

Credit Hours: 3

Subject Descriptions:

This course presents the method of solving ordinary differential Equations of First Order and Second Order, Partial Differential equations. Also it deals with Laplace Transforms, its inverse and Application of Laplace Transform in solving First and Second Order Differential Equations with constant coefficients.

Goals: It enables the students to learn the method of solving Differential Equations.

Objectives: End of this course, the students should gain the knowledge about the method of solving Differential Equations. It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences.

Unit I:

Ordinary Differential Equations: Equations of First Order and of Degree Higher than one – Solvable for p , x , y – Clairaut's Equation – Simultaneous Differential Equations with constant coefficients of the form

i) $f_1(D)x + g_1(D)y = \phi_1(t)$

ii) $f_2(D)x + g_2(D)y = \phi_2(t)$

where f_1, g_1, f_2 and g_2 are rational functions $D = \frac{d}{dt}$ with constant coefficients ϕ_1 and ϕ_2 explicit functions of t .

Unit II:

Finding the solution of Second and Higher Order with constant coefficients with Right Hand Side is of the form Ve^{ax} where V is a function of x – Euler's Homogeneous Linear Differential Equations.

Unit III:

Partial Differential Equations: Formation of equations by eliminating arbitrary constants and arbitrary functions – Solutions of P.D Equations – Solutions of Partial Differential Equations by direct integration – Methods to solve the first order P.D. Equations in the standard forms - Lagrange's Linear Equations.

Unit IV:

Laplace Transforms: Definition – Laplace Transforms of standard functions – Linearity property – Firsting Shifting Theorem – Transform of $tf(t)$, $\frac{f(t)}{t}$, $f'(t)$, $f''(t)$.

Unit V:

Inverse Laplace Transforms – Applications to solutions of First Order and Second Order Differential Equations with constant coefficients.

Treatment as in

Kandasamy. P, Thilagavathi. K “Mathematics for B.Sc – Branch – I Volume III”, S. Chand and Company Ltd, New Delhi, 2004.

References:

- 1) S. Narayanan and T.K. Manickavasagam Pillai, Calculus, S. Viswanathan (Printers and Publishers) Pvt. Ltd, Chennai 1991
- 2) N.P. Bali, Differential Equations, Laxmi Publication Ltd, New Delhi, 2004
- 3) Dr. J. K. Goyal and K.P. Gupta, Laplace and Fourier Transforms, Pragati Prakashan Publishers, Meerut, 2000

Core Paper – VI

Subject Title : Statics

Credit hours:3

Subject Description:

This course contains the nature of forces acting on a surface, friction and center of gravity.

Goal:

To enable the students to realize the nature of forces and resultant forces when more than one force acting on a particle.

Objectives:

On successful completion of course the students should realize the concept about the forces, resultant force of more than one force acting on a surface, friction and center of gravity. Also he can differentiate static and dynamic forces.

UNIT-I

Forces acting at a point – Parallelogram law-triangle law –Converse of Triangle Law- Polygon Law of Forces- Lami's Theorem

UNIT- II

(λ, μ) theorem –Resolution of forces- Components of a force- Resultant of any number of Coplanar forces acting at a point- Conditions of equilibrium.

UNIT – III

Parallel Forces and Moments –Resultant of two parallel forces (Like and unlike)-Conditions of equilibrium of three coplanar forces- Moment of a force- Geometrical representation- Sign of the moment- Unit of moment – Varignon's Theorem on couples-Equilibrium of two couples-Equivalence of two couples.

UNIT – IV

Co-planar forces acting on a rigid body – Theorem on three co-planar forces in equilibrium – Reduction of a system of coplanar forces to a single force and a couple- Equation to the line of action of the resultant – Necessary and sufficient conditions of equilibrium only.

UNIT – V

Center of gravity (using integration only) – Equilibrium of strings and chains – Equation of the common catenary – Definitions – Tension at any point – Geometrical properties of the common catenary .

Treatment as in

M.K.Venkataraman, Statics, Agasthiar Publications, Trichy, 1999.

References

1. A.V.Dharmapadam, Statics , S.Viswanathan Printers and Publishing Pvt., Ltd, 1993.
2. P.Duraipandian and Laxmi Duraipandian, Mechanics , S.Chand and Company Ltd, Ram Nagar, New Delhi -55, 1985.

Semester III - Skill Based Subject - Operations Research – Paper I
Credit hours:3

Subject description:

This course contains advantages, limitations and applications of O.R, formulation of Linear Programming Problems (L.P.P), methods to solve L.P.P. like simplex method, Charnes Penalty Method and Two Phase Simplex method. Also it deals about duality in L.P.P and Transportation with applications

Goal:

It enables the students to use the mathematical knowledge in optimal use of resources.

Objectives:

On successful completion of this course students should have gained knowledge about optimal use of resources.

Unit I:

Basics of O.R – Definition of O.R – Characteristics of O.R - Scientific methods in O.R – Necessary of O.R in Industry – O.R and Decision Making – Scope of O.R in Modern Management – Uses and limitations of O.R. Linear Programming Problem – Formulation of L.P.P .

Unit II:

Graphical solutions of L.P.P – Problems. Simplex Method – Problems

Unit III:

Charnes Penalty Method (or) Big – M Method - Two Phase Simplex method – Problems.

Unit IV:

Duality in L.P.P – Concept of duality – Duality and Simplex Method – Problems

Unit V:

The transportation Problems – Basic feasible solution by L.C.M – NWC- VAM- optimum solutions – unbalanced Transportation problems

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

SEMESTER IV

BHARATHIAR UNIVERSITY, COIMBATORE-641 046.

UNDER GRADUATE DEGREE PROGRAMMES (CBCS Semester Pattern)
(For the students admitted during the academic year 2017 -2018 onwards)

பாடத்திட்டம் - நான்காம் பருவம் - பகுதி -I தாளி; - IV

(2017-2018ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது)

(செய்யுள், நாடகம், இலக்கிய வரலாறு, இலக்கணம், படைப்பிலக்கியப் பயிற்சி)

அலகு - I எட்டுத்தொகை

- | | |
|--------------|---------------------------------------|
| 1.குறுந்தொகை | - 5 பாடல்கள் (3,32,44,49,107,144,194) |
| 2.நற்றிணை | - 2 பாடல்கள் (41, 98) |
| 3.அகநானூறு | - 2 பாடல்கள் (68,101) |
| 4.கலித்தொகை | - 2 பாடல்கள் (20,102) |
| 5.புறநானூறு | - 5 பாடல்கள் (101,189,173,191,303) |

அலகு - II

- 6.பத்துப்பாட்டு - சிறுபாணாற்றுப்படை முழுவதும்.

அலகு - III

❖ நாடகம் : காவியத் தலைவி கண்ணகி, ஆசிரியர், ஜெயந்தி நாகராஜன்.

அறிவு பதிப்பகம், 16(142), ஜானி ஜான்கான் சாலை, சென்னை - 600 014.

அலகு - IV - இலக்கிய வரலாறு

1. பொருள் புலப்பாட்டுத்திறன்
சங்க இலக்கியம் - எட்டுத்தொகை, பத்துப்பாட்டு
நாடகத்தின் தோற்றமும் வளர்ச்சியும்
2. இலக்கணம் - பாடப்பகுதியை ஒட்டிய அகப்புற இலக்கணங்களைப் பொருத்திக் காட்டுதல்.

அலகு - V - படைப்பிலக்கியப் பயிற்சி

1. கவிதை, சிறுகதை, நூல் மதிப்பீட்டுப் பயிற்சி
2. ஏதேனும் ஒரு கருவைக் கொடுத்து கதை, கவிதை எழுதச் செய்தல்
3. ஏதேனும் ஒரு நூலினை மதிப்பீடு செய்தல்.

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BHARATHIAR UNIVERSITY, COIMBATORE

PART-I, PAPER-IV, FRENCH
(COMMON FOR ALL U.G. COURSES)
SYLLABUS - UNDER CBCS – AFFILIATED COLLEGES
[with effect from 2014-2015]

SEMESTER- IV
PAPER IV

Prescribed text	: ALORS II
Units	6 – 10
Authors	: Marcella Di Giura Jean-Claude Beacco
Available at	: Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 110007.
Tel	: 011 – 23852986 / 9650597000

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BHARATHIAR UNIVERSITY : COIMBATORE – 641 046

**Part I – Hindi Language
For Under-graduate Degree Programmes
(For the Students admitted during 2016-2017 onwards)**

FOURTH SEMESTER – PAPER IV

(DRAMA, NOVEL, GENERAL ESSAY AND TRANSLATION)

1. DRAMA: Andher Nagari
 Bharathendu Harischandra

 PUBLISHER : VANI PRAKASHAN
 NEW DELHI – 110 002.
2. NOVEL : GABAN - Premchand

 PUBLISHER: RAJKAMAL PRAKASHAN
 NEW DELHI.
4. GENERAL ESSAY :
 Book for reference : AADARSH NIBANDH
 VINODH PUSTAK MANDIR
 HOSPITAL ROAD, AGRA – 282 002.
5. TRANSLATION : HINDI – ENGLISH only
 ANUVADH ABHYAS – III
 (16-30 Lessons only)

BHARATHIAR UNIVERSITY – COIMBATORE

PART II – ENGLISH

Part II English-Semester IV

Prescribed Text: **DRIZZLE**

Board of Editors

Publishers: Cambridge University Press

Unit I

Poetry

1. The Bird Scantury – Sarojini Naidu
2. Meeting at Night – Robert Browning
3. A Different History – Sujatha Bhatt

Unit II

Prose

1. Fusion Music – Ravi Shankar
2. The Sea – Robert Lynd
3. Unity of Minds – A.P.J. Abdul Kalam

Unit III

Short Stories

1. The Boy who broke the Bank – Ruskin Bond
2. The Blue Bouquet – Octavio Paz
3. Happy Prince – Oscar Wilde

Unit IV

World Renowned Speeches

Noble Prize Acceptance Speech – Toni Morrison
Chicago Address – Swami Vivekanandha

Unit V

Grammar & Composition

1. *Clauses – Conditional, Relative, Restrictive, Non-Restrictive*
2. *Notice*
3. *Agenda*
4. *Minutes*
5. *Expansion of Ideas*
6. *Precis Writing*

ALLIED PAPER – ACCOUNTANCY – II FOR B.Sc. MATHEMATICS

(For the Students admitted from the Academic Year 2007 – 2008 and onwards)

Subject Title : PRINCIPLES OF ACCOUNTANCY – II

Course/Subject code:

Credit Hours : 5 (Five) per week

Goal : To enable students to learn the Principles and Concepts of Accountancy.

Objective : On successful completion of the course, the student should have understood the

- **Concepts and Conventions of Accounting &**
- **Basic Accounting Framework.**

UNIT I:

Depreciation - Meaning- Features- Methods- Straight Line Method– WDV Method - Annuity Method - Sinking Fund Method

UNIT II :

Single Entry System – Meaning and Features – Statement of Affairs Method and Conversion Method

UNIT III :

Departmental Accounts –Branch Accounts excluding Foreign Branches

UNIT IV :

Hire Purchase and Installment Systems excluding Hire Purchase Trading Account

UNIT V :

Royalties excluding Sub-lease.

Note: Distribution of Marks for theory and problems shall be 20% and 80% respectively.

Books for Reference:

- | | |
|---------------------------------------|--|
| 1. Principles of Accountancy | - M.C.Shukla |
| 2. Introduction to Accountancy | - T.S.Grewel |
| 3. Financial Accounting | - R.L.Gupta & Radhaswamy |
| 4. Advanced Accountancy | - S.N.Maheswari |
| 5. Principles of Accountancy | - N. Vinayakam, P.L. Mani,
K.L. Nagarajan |
| 6. Fundamentals of Accounting | - Jain and Narang |

SEMESTER IV - Core Paper – VII

Subject Title: Dynamics

Subject Description: This course provides the knowledge about the field Kinematics, projectile, simple harmonic motion and impact of a particle on a surface.

Goal: To enable the students to apply Laws, Principles, Postulates governing the Dynamics in physical reality.

Objectives: End of this course, the student understands the reason for dynamic changes in the body.

UNIT – I

Projectiles: Path of a projectile-Greatest height-time of flight – Range -range on an inclined plane through the point of projection-Maximum range.

UNIT – II

Central Orbits: Radial and transverse components of velocity and acceleration – areal velocity of central orbits - Differential equation of central orbit in polar coordinates only.

UNIT – III

Simple Harmonic Motion: Amplitude, periodic time, phase-composition of two simple harmonic motions of the same period in a straight line and in two perpendicular lines.

UNIT – IV

Collision of elastic bodies : Impulsive force – Newton’s experimental law- Principle of conservation of momentum- Direct Impact on a smooth fixed plane -Direct impact of two smooth spheres- loss of kinetic energy during direct impact.

UNIT – V

Oblique impact of a smooth sphere on fixed smooth plane – oblique impact of two smooth spheres - Loss of Kinetic energy during oblique impact.

Treatment as in

M.K.Venkataraman, Dynamics, 11th Ed. Agasthiar Publications, Trichy, 1994.

References

1. A.V.Dharamapadam , Dynamics, S.Viswanathan Printers and Publishers Pvt., Ltd, Chennai, 1998.
2. K.Viswanatha Naik and M.S.Kasi, Dynamics, Emerald Publishers, 1992.
3. Naryanamurthi, Dynamics, National Publishers, New Delhi, 1991.
- 4 Statics , Kedal Nath Ram Nath, Meerut, 1983-84

SEMESTER IV : –CORE PAPER VIII (Theory & Practical)

Subject Title: Programming in C

No.of.Hours: 3

Subject Description: This paper presents the importance of c language, its structure, Data types, Operators of C, Various control statements, Arrays, different types of functions and practical problems.

Goals: To enable the students to learn about the basic structure, Statements, arrays, functions and various concepts of C language.

Objectives: On successful completion of the course the students should have:

Learnt the basic structure, operators and statements of c language.

Learnt the decision making statements and to solve the problems based on it.

Learnt arrays, functions and solve the problems Regarding about it.

UNIT I: Introduction – Importance of C Basic structure of C programme - Character set - Constants – Keywords and identifiers – Variables Data types – Declaration of variables – Assigning values to variables –Defining symbolic constants.

UNIT II: Arithmetic operators - Relational operators - logical operators – assignment operators –increment and decrement operates –Conditional operators – Special operators – Arithmetic expressions –Evaluation of expressions –Precedence of arithmetic operators – Some computational problems –Type conversion in expressions – operator precedence and associating mathematical functions.

UNIT III: Reading and Writing character – formatted input and output. Decision making with IF statement – Simple IF statement – The if ELSE statement - Nesting of IF.....ELSE statement – The ELSE IF ladder. The Switch statement –The ? Operator –The GOTO statement.

UNIT IV: The WHILE statement - the DO statement the FOR statement –Jumps in loops.

UNIT V: One, Two dimensional arrays – Initiating two dimensional arrays – Multidimensional arrays –Declaring and initializing string variables –reading strings from terminal – Writing strings on the screen – Arithmetic operations on characters.

TEXT BOOK:

E.Balagurusamy“Programming in ANSI C” Second Edition – Tata McGraw –Hill Publishing company limited, New Delhi.

REFERENCE BOOKS:

1.Byron Gottfried “Programming with C”(Schaum’s outline series)-Tata McGrawHill publishing company -1998.

2. Ashok N.Kamthane “Programming with Ansi and Turbo C”, Pearson Education publishers, 2002

3.Hentry Mullish and Herbert L cooper , “The spirit of C” Jaico publisher , 1996.

4.THE ANSI C, Second edition , October 1992.BRIAN W.KERNIGHAN,DENNIS M.RITCHIE
Published by Prentice- Hall of India Privated Limited, M-97,New Delhi- 110001.

5. ANSI C: With Microsoft C 5.1 and Quick C 2.0 C. Balasubramanian. 1992, Tata McGraw-Hill Publishing company limited, New Delhi.
6. "PROGRAMMING IN C", Kris A. Jamsa 1992, Galgotia Publications Pvt. Ltd.

SEMESTER IV : –CORE PAPER VIII (Practical)

Subject Title: Programming in C

No. of Hours: 3

1. Write a C program to generate 'N' Fibonacci number.
2. Write a C program to print all possible roots for a given quadratic equation.
3. Write a C program to calculate the statistical values of mean, median.
4. Write a C program to calculate the statistical values of Standard Deviation and variance of the given data
5. Write a C program to sort a set of numbers.
6. Write a C program to sort the given set of names.
7. Write a C program to find factorial value of a given number 'N' using recursive function call.
8. Write a C program to find the product of two given matrix.

SEMESTER IV - SKILL BASED SUBJECT

SUBJECT TITLE - OPERATIONS RESEARCH – PAPER II CREDIT HOURS: 3

Subject Description:

This course gives emphasis to enhance student knowledge in Assignment Problems, game theory, performance measures of queues and optimal use of Inventory.

Unit I:

The Assignment Problems – Assignment algorithm – optimum solutions – Unbalanced Assignment Problems.

Unit II:

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.

Unit III:

Queueing Theory – Introduction – Queueing system – Characteristics of Queueing system – symbols and Notation – Classifications of queues – Problems in $(M/M/1) : (\infty/\text{FIFO})$

Unit IV:

Problems in $(M/M/1):(N/\text{FIFO})$; $(M/M/C) : (\infty/\text{FIFO})$; $(M/M/C) : (N/\text{FIFO})$ Models.

Unit V:

Inventory control – Types of inventories – Inventory costs – EOQ Problem with no shortages – Production problem with no shortages – EOQ with shortages – Production problem with shortages – EOQ with price breaks.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

SEMESTER V

SEMESTER V - Core Paper – IX

Subject title: Real Analysis - I

Credit hours: 5

Subject Description: This course focuses on the Real and Complex number systems, set theory, point set topology and metric spaces.

Goal: To introduce the concepts which provide a strong base to understand and analysis mathematics.

Objective: On successful completion of this course the students should gain the knowledge about real and complex numbers, sets and metric space.

UNIT I

The Real and Complex number systems the field axioms, the order axioms –integers –the unique Factorization theorem for integers –Rational numbers –Irrational numbers –Upper bounds, maximum Elements, least upper bound –the completeness axiom –some properties of the supremum –properties of the integers deduced from the completeness axiom- The Archimedian property of the real number system –Rational numbers with finite decimal representation of real numbers –absolute values and the triangle inequality –the Cauchy-Schwarz, inequality –plus and minus infinity and the extended real number system.

UNIT II

Basic notions of a set theory. Notations –ordered pairs –Cartesian product of two sets – Relations and functions – further terminology concerning functions –one –one functions and inverse –composite functions –sequences –similar sets-finite and infinite sets –countable and uncountable sets –uncountability of the real number system –set algebra –countable collection of countable sets.

UNIT III

Elements of point set topology: Euclidean space \mathbb{R}^n –open balls and open sets in \mathbb{R}^n . The structure of open Sets in \mathbb{R}^n –closed sets and adherent points –The Bolzano –Weierstrass theorem –the Cantor intersection Theorem.

UNIT IV

Covering –Lindelof covering theorem –the Heine Borel covering theorem –Compactness in \mathbb{R}^n –Metric Spaces –point set topology in metric spaces –compact subsets of a metric space – Boundary of a set.

UNIT V

Convergent sequences in a metric space –Cauchy sequences –Completeness sequences – complete metric Spaces. Limit of a function –Continuous functions –continuity of composite functions. Continuous complex valued and vector valued functions.

Treatment as in

T.M.Apostol, Mathematical Analysis, 2nd ed., Narosa Publishing Company, Chennai, 1990.

Unit I	Chapter 1	Sections 1.2, 1.3, 1.6 to 1.16, 1.18 to 1.20
Unit II	Chapter 2	Sections 2.2 to 2.15
Unit III	Chapter 3	Sections 3.2 to 3.9
Unit IV	Chapter 3	Sections 3.10 to 3.16
Unit V	Chapter 4	Sections 4.2 to 4.5, 4.8 to 4.15

References

1. R.R.Goldberg, Methods of Real Analysis, NY, John Wiley, New York 1976.
2. G.F.Simmons, Introduction to Topology and Modern Analysis, McGraw – Hill, New York, 1963.
3. G.Birkhoff and MacLane, A survey of Modern Algebra, 3rd Edition, Macmillan, New York, 1965.
4. J.N.Sharma and A.R.Vasistha, Real Analysis, Krishna Prakashan Media (P) Ltd, 1997.

SEMESTER V - Core Paper – X

Subject title: Complex Analysis - I

Credit hours: 6

Subject Description: This course provides the knowledge about complex number system and complex functions.

Goal: To enable the students to learn complex number system, complex function and complex integration.

Objectives: On successful completion of this course the students should gained knowledge about the origin, properties and application of complex numbers and complex functions.

UNIT I

Complex number system, Complex number –Field of Complex numbers – Conjugation – Absolute value -Argument –Simple Mappings.

$$\text{i) } w = z + \alpha \quad \text{ii) } w = az \quad \text{iii) } w = 1/z$$

invariance of cross-ratio under bilinear transformation –Definition of extended complex plane – Stereographic projection.

UNIT II

Complex functions: Limit of a function –continuity –differentiability – Analytical function defined in a region –necessary conditions for differentiability –sufficient conditions for differentiability –Cauchy-Riemann equation in polar coordinates –Definition of entire function.

UNIT III

Power Series: Absolute convergence –circle of convergence –Analyticity of the sum of power series in the Circle of convergence (term term differentiation of a series) Elementary functions : Exponential, Logarithmic, Trigonometric and Hyperbolic functions.

UNIT IV

Conjugate Harmonic functions: Definition and determination, Conformal Mapping: Isogonal mapping –Conformal mapping-Mapping $z \mapsto f(z)$, where f is analytic, particularly the mappings.

$$w = e^z; w = z^{1/2}; w = \sin z; w = 1/2(z + 1/z)$$

UNIT V

Complex Integration: Simply and multiply connected regions in the complex plane. Integration of $f(z)$ from definition along a curve joining z_1 and z_2 . Proof of Cauchy's Theorem (using Goursat's lemma for a simply connected region). Cauchy's integral formula for higher derivatives (statement only)-Morera's theorem.

Treatment as in

P.Duraipandian and Laxmi Duraipandian, Complex Analysis, Emerald Publishers, Chennai –2, 1986.

Unit I	Chapter 1	Sections 1.1 to 1.3, 1.6 to 1.9
	Chapter 2	Sections 2.1 to 2.2, 2.6 to 2.9,
	Chapter 7	Section 7.1
Unit II	Chapter 4	Sections 4.1 to 4.10
Unit III	Chapter 6	Sections 6.1 to 6.11
Unit IV	Chapter 6	Sections 6.12 to 6.13
	Chapter 7	Sections 7.6 to 7.9
Unit V	Chapter 8	Sections 8.1 to 8.9

References

1. Churchill and Others, Complex Variable and Applications, Tata Mecgrow Hill Publishing Company Ltd, 1974.
2. Santhinarayan, Theory of functions of Complex Variable, S.Chand and Company, Meerut, 1995.
3. Tyagi B.S. Functions of Complex Variable, 17th Edition, Pragati Prakasham Publishing Company Ltd, Meerut, 1992-93.

SEMESTER V - Core Paper – XI

Subject title: Modern Algebra - I

Credit hours: 6

Subject description: This course provides knowledge about sets, mappings, different types of groups and rings.

Goals: To enable the students to understand the concepts of sets, groups and rings. Also the mappings on sets, groups and rings.

Objective: On successful completion of course the students should have concrete knowledge about the abstract thinking like sets, groups and rings by proving theorems.

UNIT I

Sets – mappings – Relations and binary operations – Groups: Abelian group, Symmetric group Definitions and Examples – Basic properties.

UNIT II

Subgroups – Cyclic subgroup - Index of a group – Order of an element – Fermat theorem - A Counting Principle - Normal Subgroups and Quotient Groups.

UNIT III

Homomorphisms (Applications 1 and 2 are omitted) – Automorphisms – Inner automorphism - Cayley's theorem, permutation groups

UNIT IV

Rings: Definition and Examples –Some Special Classes of Rings – Commutative ring – Field – Integral domain - Homomorphisms of Rings.

UNIT V

Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal - The field of Quotients of an Integral Domain

Treatment as in

I.N. Herstein, Topics in Algebra, John Wiley & Sons, New York, 2003.

Unit I	Chapter 1	Sections 1.1 to 1.3,
	Chapter 2	Sections 2.1 to 2.3
Unit II	Chapter 2	Sections 2.4 to 2.6
Unit III	Chapter 2	Sections 2.7 to 2.10
Unit IV	Chapter 3	Sections 3.1 to 3.3
Unit V	Chapter 3	Sections 3.4 to 3.6.

References

1. Surjeet Singh and Qazi Zameeruddin, Modern Algebra, Vikas Publishing house, 1992.
2. A.R.Vasishtha, Modern Algebra, Krishna Prakashan Mandir, Meerut, 1994 - 95.

SEMESTER – V - CORE PAPER XII

Subject Title: DISCRETE MATHEMATICS

Credit Hours: 5

Subject Description: This course focuses on the mathematical logic, Relations & Functions, Formal languages and Automata, Lattices and Boolean Algebra and Graph Theories.

Goal: To enable the students to learn about the interesting branches of Mathematics.

Objectives: On successful completion of this course should gain knowledge about the Formal languages Automata Theory, Lattices & Boolean Algebra and Graph Theory.

UNIT-I:

Mathematical logic: Connections well formed formulas, Tautology, Equivalence of formulas, Tautological implications, Duality law, Normal forms, Predicates, Variables, Quantifiers, Free and bound Variables. Theory of inference for predicate calculus.
(1-2, 1-2.7, 1-2.9, 1-2.10, 1-2.11, 1-3, 1-5.1, 1-5.2, 1-5.4, 1-6.4)

UNIT-II:

Relations and functions: Composition of relations, Composition of functions, Inverse functions, one-to-one, onto, one-to-one & onto, onto functions, Hashing functions, Permutation function, Growth of functions. Algebra structures: Semi groups, Free semi groups, Monoids.
(2-3.5, 2-3.7, 2-4.2, 2-4.3, 2-4.6, 3-2, 3-5, 3-5.3,)

UNIT-III:

Formal languages and Automata: Regular expressions, Types of grammar, Regular grammar and finite state automata, Context free and sensitive grammars.
(3-3.1, 3-3.2, 4-6.2)

UNIT-IV:

Lattices and Boolean algebra: Partial ordering, Poset, Lattices, Boolean algebra, Boolean functions, Theorems, Minimisation of Boolean functions (Karnaugh Method only).
(4-1.1, 4-2, 4-3, 4-4.2)

UNIT-V:

Graph Theory: Directed and undirected graphs, Paths, Reachability, Connectedness, Matrix representation, Euler paths, Hamiltonian paths, Trees, Binary trees simple theorems, and applications. (5-1.1, 5-1.2, 5-1.3, 5-1.4)

Text Books:

J.P Tremblay and R.P Manohar “Discrete Mathematical Structures with applications to computer science”, Mc.Graw Hill, 1975.

Semester V - Skill Based Subject

Subject title: Operations Research – Paper III - Credit hours: 3 (15-16)

Subject Description:

This course presents applications and method to solve Network Scheduling, Integer Programming Problems, Non-linear Programming Problems and Dynamic Programming problems.

Unit I:

Simulation – Introduction – simulation models – Event – Types of simulation - Generation of Random Numbers – Monte-carlo simulation – simulation of queueing system.

Unit II:

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.

Unit III:

Integer Programming Problem – Gomory's fractional cut Method – Branch and Bound Method.

Unit IV:

Non-linear Programming Problems – General NLPP – Lagrange multiplier – Hessian bordered Matrix – Kuhn Tucker Condition – Problems

Unit V:

Dynamic Programming Problem – Recursive equation approach – D.P.P Algorithm – Solution of L.P.P by D.P.P.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd

SEMESTER VI

SEMESTER VI - Core Paper – XIII

Subject Title: REAL ANALYSIS - II

Credit hours: 5

Subject Description: This course presents nature of functions and mappings like continuity, connectivity, and derivative. It also includes the concept of monotonic functions with properties and Riemann - Stieltjes integral.

Goal: To introduce the concepts which provide a strong base to understand and analysis mathematics.

Objective: On successful completion of this course the students should gain the knowledge about the nature of functions mappings.

UNIT I

Examples of continuous functions –continuity and inverse images of open or closed sets – functions continuous on compact sets –Topological mappings –Bolzano's theorem.

UNIT II

Connectedness –components of a metric space – Uniform continuity : Uniform continuity and compact sets –fixed point theorem for contractions –monotonic functions.

UNIT III

Definition of derivative –Derivative and continuity –Algebra of derivatives – the chain rule –one sided derivatives and infinite derivatives –functions with non-zero derivatives –zero derivatives and local extrema –Roll's theorem –The mean value theorem for derivatives – Taylor's formula with remainder.

UNIT IV

Properties of monotonic functions –functions of bounded variation –total Variation –additive properties of total variation on (a, x) as a function of x – functions of bounded variation expressed as the difference of increasing functions –continuous functions of bounded variation.

UNIT V

The Riemann - Stieltjes integral : Introduction –Notation –The definition of Riemann –Stieltjes integral –linear properties –Integration by parts –change of variable in a Riemann –stieltjes integral –Reduction to a Riemann integral.

Treatment as in

Tom. M. APOSTOL, Mathematical Analysis, 2nd ed., Addison-Wisely. Narosa Publishing Company, Chennai, 1990.

Unit I	Chapter 4	Sections 4.11 to 4.15
Unit II	Chapter 4	Sections 4.16, 4.17, 4.19, 4.20, 4.21, 4.23
Unit III	Chapter 5	Sections 5.2 to 5.10 and 5.12
Unit IV	Chapter 6	Sections 6.2 to 6.8
Unit V	Chapter 7	Sections 7.1 to 7.7

References

1. R.R.Goldberg, Methods of Real Analysis, NY, John Wiley, New York 1976.
2. G.F.Simmons, Introduction to Topology and Modern Analysis, McGraw – Hill, New York, 1963.
3. G.Birkhoff and MacLane, A survey of Modern Algebra, 3rd Edition, Macmillian, NewYork, 1965.
4. J.N.Sharma and A.R.Vasistha, Real Analysis, Krishna Prakashan Media (P) Ltd, 1997.

SEMESTER VI - Core Paper – XIV

Subject title: COMPLEX ANALYSIS - II

Credit hours: 6

Subject Description: This course provides the knowledge about complex functions with some fundamental theorems. Singularity and residues in complex functions, integrations of complex functions and meromorphic functions

Goal: To enable the students to learn complex number system, complex function and complex integration.

Objectives: On successful completion of this course the students should gained knowledge about the complex functions and its nature.

UNIT I

Results based on Cauchy's theorem(I) : Zeros-Cauchy's Inequality – Lioville's theorem – Fundamental theorem of algebra –Maximum modulus theorem –Gauss mean value theorem – Gauss mean value theorem for a harmonic function on a circle .

UNIT II

Results based on Cauchy's theorem (II) –Taylor's series –Laurent's series .

UNIT III

Singularities and Residues: Isolated singularities (Removable Singularity, pole and essential singularity) –Residues –Residue theorem.

UNIT IV

Real definite integrals: Evaluation using the calculus of residues – Integration on the unit circle –Integral with $-\infty$ and $+\infty$ as lower and upper limits with the following integrals:

- $P(x)/Q(x)$ where the degree of $Q(x)$ exceeds that of $P(x)$ at least 2.
- $(\sin ax).f(x)$, $(\cos ax).f(x)$, where $a>0$ and $f(z) \rightarrow 0$ as $z \rightarrow \infty$ and $f(z)$ does not have a pole on the real axis.
- $f(x)$ where $f(z)$ has a finite number of poles on the real axis.
Integral of the type $\int_{-\infty}^{\infty} x^{a-1}/(1+x) dx$; $0 < a < 1$;

UNIT V

Meromorphic functions: Theorem on number of zeros minus number of poles –Principle of argument: Rouche's theorem – Theorem that a function which is meromorphic in the extended plane is a rational function.

Treatment as in

P. Duraipandian and Laxmi Duraipandian, Complex analysis, Emerald Publishers, Chennai –2, 1997.

Unit I	Chapter 8	Sections 8.10, 8.11
Unit II	Chapter 9	Sections 9.1 to 9.3, 9.13.
Unit III	Chapter 9	Sections 9.5 to 9.12, 9.13.
	Chapter 10	Sections 10.1, 10.2 and 10.4.
Unit IV	Chapter 10	Sections 10.3 and 10.4.
Unit V	Chapter 11	Sections 11.1 to 11.3 (Omit theorems 11.5 and 11.6)

References

1. Churchill and Others, Complex Variable and Applications, Tata Mecgrow Hill Publishing Company Ltd, 1974.
2. Santhinarayan , Theory of functions of Complex Variable, S.Chand and Company ,Meerut, 1995.
3. Tyagi B.S , Functions of Complex Variable, 17th Edition, Pragati Prakasham Publishing Company Ltd, Meerut, 1992-93.

SEMESTER VI - Core Paper – XV

Subject title: MODERN ALGEBRA - II

Credit hours: 6

Subject description:

This course provides knowledge about elementary operations on matrices, different types of matrices, rank of a matrix, spaces and linear transformations.

Goals:

It enables the students to understand the concept of matrices and linear transformations.

Objective:

On successful completion of course the students should have concrete knowledge about the elementary operations on matrices, characteristic vector of a square matrix, vector spaces and linear transformations.

UNIT I

Matrices: Introduction – Addition and Scalar Multiplication of Matrices – Product of Matrices –Transpose of a Matrix – Matrix Inverse – Symmetric and Skew - Symmetric Matrices.

UNIT II

Hermitian and Skew-Hermitian Matrices – Orthogonal and Unitary Matrices – Rank of a Matrix –Characteristic Roots and Characteristic Vectors of a Square Matrix.

UNIT III

Vector space: Elementary Basic Concepts – Subspace of a Vector space - Homomorphism – Isomorphism - Internal and External direct sums - Linear span - Linear Independence and Bases.

UNIT IV

Dual Spaces – Annihilator of a subspace - Inner Product Spaces – Norm of a Vector – Orthogonal Vectors - Orthogonal Complement of a subspace – Orthonormal set.

UNIT V

Linear Transformations: Algebra of Linear Transformations – Regular, Singular Transformations – Range of T – Rank of T - Characteristic Roots – Characteristic Vectors - Matrices.

Treatment as in

1. R.Balakrishnan and M. Ramabadran, Modern Algebra, Vikas Publishing House Pvt. Ltd, New Delhi, (Second Revised Edition 1994) (For Units I & II)

Unit I	Chapter 1	Sections 1.1 to 1.3, 1.5 to 1.7
Unit II	Chapter 1	Sections 1.8 and 1.9
	Chapter 2	Section 2.9
Chapter 3	Section 3.9	

2. I.N. Herstein, Topics in Algebra, John Wiley & Sons, New York, 2003. (For Units III, IV & V)

Unit III	Chapter 4	Sections 4.1 and 4.2
Unit IV	Chapter 4	Sections 4.3 and 4.4
Unit V	Chapter 6	Sections 6.1 , 6.2 and 6.3

References

1. Surjeet Singh and Qazi Zameeruddin, Modern Algebra, Vikas Publishing house, 1992.
2. A.R.Vasishtha, Modern Algebra, Krishna Prakashan Mandir, Meerut, 1994 – 95.
3. Seymour Lipschutz and Marc Lipson, Linear Algebra, 3rd Edition, McGraw Hill, 2001.

SEMESTER-VI SKILL BASED SUBJECT SUBJECT TITLE: OPERATIONS RESEARCH - PAPER -IV

SUBJECT DESCRIPTION:

This course enhances the students knowledge in decision analysis, sequencing the jobs to be carried out based on cost optimization; improve the power on replacement policies; analyse the cases according to their categories and improves the programming techniques.

Unit I:

Decision Analysis – Decision Making environment – Decisions under uncertainty – Decision under risk – Decision – Tree Analysis.

UNIT--II:

SEQUENCING PROBLEMS

Introduction-problem of sequencing - basic terms used in sequencing- processing n-jobs through 2 machines - processing n -jobs through k machines -- processing 2 jobs through k machines(Problems only).

UNIT-III

REPLACEMENT PROBLEMS

Introduction - Replacement of equipment / assets that deteriorates gradually - replacement of equipment that fails suddenly and problems.

UNIT--IV:

INFORMATION THEORY:

Introduction- A measure of Information-Axiomatic Approach to Information- Entropy-The expected information- Some properties of entropy function-Joint and conditional entropies.

UNIT -- V :

APPLICATIONS:

General solution of (mxn) rectangular games using simplex method - Reliability and system failure rates using replacement problems.

REFERENCES :

1. Operations research ; Kandiswarup ; P. K. Gupta ; Man Mohan ; S.Chand &sons education publications ; New Delhi.
2. Operations research : P K Gupta ; D S Hira ; S. Chand and company ltd. Ram Nagar; New Delhi.
3. Operations research principles problems ; S Dharani venkata krishnan ;keerthi publishing house Pvt. Ltd.

ELECTIVE I - A

SUBJECT TITLE: ASTRONOMY – I

CREDIT HOURS: 5

Subject Description : This course focuses on the Solar system, Celestial sphere, Dip-Twilight & Kepler's laws.

Goal: To enable the students to understand the Astronomical aspects and about the laws governing the planet movements.

Objectives: On successful completion of this course the students should gain knowledge about Astronomy.

UNIT I:

General description of the Solar system. Comets and meteorites – Spherical trigonometry.

UNIT II:

Celestial sphere – Celestial co – ordinates – Diurnal motion – Variation in length of the day.

UNIT III:

Dip – Twilight – Geocentric parallex.

UNIT IV:

Refraction – Tangent formula – Cassinis formula.

UNIT V:

Kepler's laws – Relation between true eccentric and mean anomalies.

Treatment as in "ASTRONOMY" by S.Kumaravelu and Susheela Kumaravelu.

Question paper setters to confine to the above text book only.

ELECTIVE I - B ELECTIVE I - B

NUMERICAL METHODS - I

Subject Description:

This course presents method to solve linear algebraic and transcendental equations and system of linear equations. Also Interpolation by using finite difference formulae.

Goal:

It exposes the students to study numerical techniques as powerful tool in scientific computing.

Objective:

On successful completion of this course the student gain the knowledge about solving the linear equations numerically and finding interpolation by using difference formulae.

Unit I: The solution of numerical algebraic and transcendental Equations:

Bisection method – Iteration Method – Convergence condition – Regula Falsi Method – Newton – Raphson method - Convergence Criteria – Order of Convergence.

Unit II: Solution of simultaneous linear algebraic equations:

Gauss elimination method – Gauss Jordan method – Method of Triangularization – Gauss Jacobi method – Gauss Seidel method

Unit III: Finite Differences:

Differences – operators – forward and backward difference tables – Differences of a polynomial – Factorial polynomial – Error propagation in difference table.

Unit IV: Interpolation (for equal intervals):

Newton's forward and backward formulae – equidistant terms with one or more missing values – Central differences and central difference table – Gauss forward and backward formulae – Stirlings formula.

Unit V: Interpolation (for unequal intervals):

Divided differences – Properties – Relations between divided differences and forward differences – Newton's divided differences formula – Lagrange's formula and inverse interpolation.

Treatment as in

Kandasamy. P, Thilagavathi. K and Gunavathi. K “Numerical methods” – S. Chand and Company Ltd, New Delhi – Revised Edition 2007. (Chapters: 3,4,5,6,7 and 8).

References:

1. Venkataraman M. K., "Numerical Methods in Science and Engineering" National Publishing company V Edition 1999.
2. Sankara Rao K., "Numerical Methods for Scientists and Engineers" 2nd Edition Prentice Hall India 2004.

ELECTIVE II - A

Subject Title: ASTRONOMY II

Credit Hours -5

Subject Description:

This course focuses on the Time, Annual Parallax, Precession, Nutation and The Moon, Eclipses.

Goal: To enable the students to learn about the interesting facts of Moon, Sun Planetary Motion.

Objectives: On successful completion of this course the students should gain knowledge about Astronomy.

UNIT-I:

Time: Equation of time – Conversion of time – Seasons – Calendar.

UNIT-II:

Annual Parallax – Abberation.

UNIT-III:

Precession – Nutation.

UNIT-IV:

The Moon – Eclipses.

UNIT-V:

Planetary Phenomenon – The Stellar system.

Treatment as in “ASTRONOMY” by Mr.S.Kumaravelu and Susheela Kumaravelu.

Question paper setters to confine to the above text book only.

ELECTIVE II-B

Numerical Methods II

Subject Description:

This course presents Numerical differentiation, Numerical integration and method to solve the differential equations.

Goal:

It exposes the students to study numerical techniques as powerful tool in scientific computing.

Objective:

On successful completion of this course the student gain the knowledge about solving the linear equations numerically and finding interpolation by using difference formulae.

Unit I: Numerical differentiations:

Newton's forward and backward formulae to compute the derivatives – Derivative using Stirlings formulae – to find maxima and minima of the function given the tabular values.

Unit II: Numerical Integration:

Newton – Cote's formula – Trapezoidal rule – Simpson's $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ rules.

Unit III: Difference Equation:

Order and degree of a difference equation – solving homogeneous and non – homogeneous linear difference equations.

Unit IV:

Taylor series method – Euler's method – improved and modified Euler method – Runge Kutta method(fourth order Runge Kutta method only)

Unit V: Numerical solution of O.D.E(for first order only):

Milne's predictor corrector formulae – Adam-Bashforth predictor corrector formulae – solution of ordinary differential equations by finite difference method (for second order O.D.E).

Treatment as in

Kandasamy. P, Thilagavathi. K and Gunavathi. K "Numerical methods" – S. Chand and Company Ltd, New Delhi – Revised Edition 2007.
(Chapters: 9,10,11, Appendix and Appendix E).

References:

1. Venkataraman M. K., "Numerical Methods in Science and Engineering" National Publishing company V Edition 1999.
2. Sankara Rao K., "Numerical Methods for Scientists and Engineers" 2nd Edition Prentice Hall India 2004.

ELECTIVE III - A

Subject Title: GRAPH THEORY

Credit Hours-5

Subject Description:

This course focuses on the Graphs, Sub Graphs, Trees, Planar graphs, Directed graphs. It also deals about matrix representation of Graphs.

Goal:

To enable the students to understand the basic concepts of Graph Theory.

Objectives:

On successful completion of this course the students should gain knowledge about Graph Theory.

UNIT I:

Graphs –Sub graphs – Degree of a vertex walks, paths and cycles in a Graphs – connectedness cut vertex and cut edge.

UNIT II:

Euler and Hamiltonian Graphs – Algorithm for Eulerian circuits – Bipartite Graphs –Trees.

UNIT III:

Matrix representation of a graph – vector spaces, associated with a graph – cycle spaces and cut set graphs.

UNIT IV:

Planar graphs – Euler's theorem on planar graphs – characterization of planar graphs (no proofs) of the difficult part of the characterization.

UNIT V:

Directed graphs – Connectivity – Eulerian Digraphs – Tournaments.

Treatment as in "A First Course in Graph Theory" by A.Chandran (Macmillan)
Chapters 1 to 7.

Books for References:

- 1.Narasimha Deo, "Graph Theory" (Prentice Hall of India).
2. Harary: "Graph Theory" (Narosa Publishing House).

ELECTIVE III - B

AUTOMATA THEORY AND FORMAL LANGUAGES

UNIT – I

Introduction – phrase structure languages.

UNIT – II

Closure operations.

UNIT – III

Context free languages.

UNIT – IV

Finite state automata.

UNIT – V

Push down automata.

Content and treatment as in, 'Formal Languages and Automata' by Rani Sriomoney.
Revised edition 1984. Published by the Christian Literary Society, Madras-3
Chapters 1 to 6.

Reference Books:

1. Hopcroft and still man-Formal languages and their relation automata-Addison Wesley.
2. R.Y.Kulin-Automata theory-Machines and Languages-McGraw Hill.

SEMESTER VI; ELECTIVE III - C
Subject Title: PROGRAMMING IN C++ (Theory & Practical)

Subject Description: This paper presents the importance of class structure, operators, the types of inheritance and polymorphism, file handling.

Goals: To enable the students to learn about the class structure, operators, inheritance, polymorphism, file handling.

Objectives: On successful completion of the course the students should have learnt class structure, member functions & data members.

Learnt the concept of inheritance, types and example problems.

Learnt the concepts of polymorphism, types and problems.

Learnt the concepts of File handling.

UNIT-I:

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

UNIT-II:

Functions in C++ : The main function – function prototyping – call by reference – return by reference – inline functions – default arguments – const arguments – function overloading.

Managing Console I/O Operations: C++ streams – C++ stream classes – unformatted console I/O operations – formatted console I/O operations – managing output with manipulators.

UNIT-III:

Classes and Objects: Specifying a class – defining member functions – making an outside function inline – nesting of member functions – private member functions – arrays within a class – memory allocation for objects – arrays of objects – objects as function arguments – friend functions – returning objects – const member functions.

Constructors and Destructors: Introduction – constructors – parameterized constructors – multiple constructors in a class – constructors with default arguments – copy constructor.

UNIT-IV:

Operator Overloading: Introduction – defining operator overloading – overloading unary operators – overloading binary operators - overloading binary operators using friends – rules for overloading operators.

UNIT-V:

Inheritance: Introduction – defining derived classes – single inheritance – making a private member inheritable – multilevel inheritance – multiple inheritance – hierarchical inheritance – hybrid inheritance.

Text Books:

1. E.Balagurusamy - 'Object Oriented programming with C++', McGraw Hill.
2. Robert Lafore - 'Object oriented programming in Turbo C++', Galgotia publications Pvt.Ltd, New Delhi- 110002 11994.
3. Bjarne Stroutstrup - 'The C++ programming language', II Edition, Addison Wesley, 1991.

Reference Books:

1. D.Ravi Chandran - 'Programming with C++', Tata McGraw-Hill publishing company limited (1996), New Delhi.
2. Ashok N.Kamthane - 'Object Oriented Programming with ANSI and Turbo C++', Pearson Education publishers (2003).
3. John R.Hubbard - 'Programming with C++', 2nd Edition, TMH publishers(2002).

PROGRAMMING IN C++ - PRACTICAL LIST.

1. Write a function 'power()' to raise a number 'm' to a power 'n'. The function takes a 'double' value for 'm' and 'int' value for 'n', and returns the result correctly. Use a default value of 2 for 'n' to make the function to calculate squares when this argument is omitted. Write a 'main()' that gets the values of 'm' and 'n' from the user to test the function.
2. Write a program to compute compound interest of a given amount AMT for 'n' years. Use function overloading so that the program gets input of interest rate RATE in any of the data type 'float' or 'int'.
3. Create a class which consist of employee detail ENO, ENAME, DEPT, BASIC SALARY. 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 and display the payslip in a neat format using console I/O.
4. Define two classes POLAR and RECTANGLE to represent points in the polar and rectangle system. Write a program to convert from one system to another.
5. Create a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT.