SRI CHANDRASEKHARENDRA SARASWATHI VISWA MAHAVIDYALAYA

(University u/s 3 of UGC Act 1956)
(Accredited with "A" Grade by NAAC)
Enathur, Kanchipuram – 631 561. Tamilnadu,
www.kanchiuniv.ac.in

DEPARTMENT OF MATHEMATICS

B.Sc., Mathematics Syllabus

With effect from 2015

SRI CHANDRASEKHARENDRA SARASWATHI VISWA MAHAVIDYALAYA

Enathur, Kanchipuram-631561

Department of Mathematics
Faculty of Science

Minutes of Board of Studies in Mathematics

Date: 25-01-2018 Time: 9:30 A.M Venue: Seminar Hall

The Board of studies meeting in Mathematics held on 25.01.2018 by 9.30 am at the faculty of science seminar hall, SCSVMV campus. The following members attended the meeting.

S.No.	Name and Designation	Position
1.	Dr.K. Srinivasa Rao, Professor & Head, Dept of Mathematics, SCSVMV	Chairman
2.	Mrs.D. Vijayalakshmi, Assistant Professor of Mathematics,SCSVMV	Member
3.	Dr. E. Geetha Assistant Professor of Mathematics, SCSVMV	Member
4.	Dr. Gnanaraj Thomas (Rtd) Associate Professor of Mathematics Madras Christian College, Chennai	Co-opted Member
5.	Dr. S.J.Venkatesan Associate Professor of Mathematics Government Arts College for Men Nandanam, Chennai	Co-opted Member
6.	Dr.S. Balaji Dean(Faculty of Science) SCSVMV	Member

Minutes of the meeting

- The syllabus of Dynamics and Abstract Algebra offered to III B.Sc., (Mathematics) are revised and updated with effect from the academic year 2018-19 onwards.

- The syllabus of M.Sc Mathematics is scrutinized and accepted with minor changes by the committee for implementation with effect from the academic year 2018-19 onwards.

- Proposal for the change in exam pattern for M.Phil Mathematics from annual to semester is discussed and approved by the committee.

- Proposal for common Mathematics syllabus from I semester to V semester for B.E(ECE,EEE,EIE and Mechatronics) and B.E (Mechanical, Civil Engineering and Civil & Structural Engineering) is approved by the members for implementation with effect from the academic year 2018-19 onwards

- A minor change in Operations Research paper offered for VII semester B.E (Mechanical) and VI semester B.E (E&I , Mechatronics) is accepted and approved for implementation with effect from the academic year 2018-19 onwards

Attendance Sheet

S.No.	Name and Designation	Position	Signature
1.	Dr.K. Srinivasa Rao, Professor & Head, Dept of Mathematics, SCSVMV	Chairman	K Srinivasa Rao 25/1/18
2.	Mrs.D. Vijayalakshmi, Assistant Professor of Mathematics,SCSVMV	Member	D.Vijayalakshmi 25/1/18
3.	Dr. E. Geetha Assistant Professor of Mathematics, SCSVMV	Member	E Geetha 25.1.18
4.	Dr. Gnanaraj Thomas (Rtd) Associate Professor of Mathematics Madras Christian College, Chennai	Co-opted Member	D.Gnanaraj Thomas 25/01/18
5.	Dr. S.J.Venkatesan Associate Professor of Mathematics Government Arts College for Men Nandanam, Chennai	Co-opted Member	S.J.Venkatesan 25/1/18
6.	Dr.S. Balaji Dean(Faculty of Science) SCSVMV	Member	S. Balaji 25/1/2018

Regulations - B.Sc (Mathematics) Programme

Credits

Each course is normally assigned one credit per lecture / tutorial per week and one credit for two periods or part thereof for laboratory or practical per week. Each semester curriculum shall normally have a blend of theory and practical course.

Duration of the Programme

A student is normally expected to complete B.Sc., (Mathematics) Programme in three years but in any case not more than seven years from the time of admission.

Registration for Courses

A newly admitted student will automatically be registered for the entire course prescribed for the first year without any option.

Every other student should submit a completed registration form indicating the list of course intended to be credited during the next semester. This registration will be done a week before the last working day of the current semester. Late registration with the approval of the department along recommendation of the head of the department along with a late fee will be done up to the last working day.

Assessment

The break – up of assessment and examination marks for the theory subjects is as follows:

First Assessment	: 15 Marks
Final Assessment	: 15 Marks
Assignment/Attendance	: 10 Marks
Examination	: 60 Marks

The break – up of assessment and examination marks for the Practical subjects is as follows:

First Assessment	: 15 Marks

Final Assessment	: 15 Marks
Maintenance of Record Book	: 10 Marks
Examination	: 60 Marks

Student Counsellor

To help the students in planning the course of study and for general advice on the academic programme, the head of the department will attach a certain number of students to a member of faculty who shall function as student counsellor for those students throughout their period of study, Such student counsellor shall advice the student, preliminary approval for the courses to be taken by the students during each semester and obtain the final approval of the head of the department.

Class Committee

For each of the semester, separate class committees will be constituted by the head of the department. The composition of the class committees from first to sixth semesters will be follows.

Course co-coordinators are appointed by the head of the department from among the staff members teaching the course.

All the student counsellors of the class and the head of the department (if not already a member) or any staff member nominated by the head of the department may opt to be special invitees.

The meeting will be held within a week after the completion the first assessment to review the performance and for follow – up action.

The second meeting will be held within a week after the final assessment is completed to review the performance and for the follow – up action.

The third meeting will be held after all the assessments are completed for all the courses, and at least one week before on the commencement of the examinations. During the meeting assessment in a maximum, of 40 marks will be finalized for every student and tabulated and submitted to the head of the department for approval and transmission to the controller of examinations.

Withdrawal from a Course

A student can withdraw from a course at any time before a date fixed by the head of the department prior to the final assessment, with the approval of the dean of the faculty on the recommendation of the head of the department.

Temporary Break of Study

A student can take a one – time temporary break of study covering the current year/ semester and /or the next semester with the approval of the head of the department, not later than after completion of the mid – semester test. However, the student must complete the entire programme within the maximum period of years.

Substitute Arrangement

A student, who has missed, for genuine reasons accepted by the head of the department, one or more of assessments of a course other than the examination, may take a substitute.

Assessment for any one of the missed assessments. The substitute assessment must be completed before the date of the fourth meeting of the respective class committees.

A student who wishes to have a substitute assessment for a missed assessment must apply to the head of the department within a week from the date of the missed assessment.

Attendance Requirements

To be eligible to appear for the examination in a particular course, a student must get minimum of 80% in the course. However, if the attendance is 70% or above but less than 80% in any course, the authorities can permit the student to appear for the examination in the course on payment of the prescribed condition fees.

A student who withdraws from or does not meet the minimum attendance requirement in course must re-register for and repeat the course.

Passing and Declaration of Examination Results

All assessments of all the courses on absolute marks basis will be considered and passing by the results passing board in accordance with the rules of the

university. Thereafter, the controller of examinations shall convert marks for each course to the corresponding letter grade as follows to compute the grade point average and cumulative grade point average, and prepare the grade cards.

90-100 Marks	: S Grade
80-89 Marks	: A Grade
70-79 Marks	: B Grade
60-69 Marks	: C Grade
55-59 Marks	: D Grade
50-54 Marks	: E Grade
Less than 50 Marks	: F Grade
Insufficient Attendance	: I Grade
Withdrawn from Course	: W Grade

A student who obtains less than 24 marks out of 60 in the examination or is absent for the examination will be awarded grade "F".

A student who earns a grade of S, A, B, C, D, or E for a course is declared to have successfully completed that course and earned credits for that course. Such a course cannot repeat by the student.

A student who obtains letter grade F in a course has to reappear for the examinations in that course.

A student who obtains letter grade I or W in a course has to re -register for and repeat the course.

The following grade points are associated with each letter grade for and repeat the point average and cumulative grade point average.

S - 10; A - 09; B - 08; C - 07; D - 06; E - 05; F - 0.

Course with grades I and W is not considered for calculation of grade point average or cumulative grade point average. F grade will be considered for computing GPA and CGPA.

A student can apply for re - totaling for one or more of his examination answer papers within a week from the date of issue of the grade sheet to the students on payment of prescribed fee per paper. The application must be made to the controller of Examinations with the recommendation of the head of the department.

After results are declared, grade cards will be issued to the students. The grade cards will contain the list of courses registered during the year / semester, the grades scored and the grade point average (GPA) for the year / semester.

GPA is the sum of the products of the number of credits of a course with the grade point scored in that course, taken over all the courses for the year/ semester, divided by the sum of the number of credits for all courses taken in that year / semester. CGPA is similarly calculated considering all the courses taken from the time of admission.

After successful completion of the programme, the degree will be awarded with the following classification based on CGPA.

For First Class with Distinction the student must pass all the courses in the first attempt and obtain a CGPA of 8.25 or above.

For First Class the student must pass all the courses in the first attempt and obtain a CGPA of 6.5 or above.

For Second Class the student must pass all the courses in the first attempt and obtain a CGPA of 4.0 or above.

B.Sc (Mathematics) Curriculum

Semester	Paper	Sub Code	Internal Marks	External Marks	Total Marks	Credits
I	Language I	LT101/LH101/LS101	40	60	100	3
	English I	LE102	40	60	100	3
	Analytical geometry and Trigonometry	UM103	40	60	100	4
	Calculus	UM104	40	60	100	4
	Principles of Environmental Science	UM105	40	60	100	4
	Allied Statistics I	UM106	40	60	100	4
	Lab – Basics of MatLab*		-	-	-	-
	Sanskrit and Indian culture I	IC107	100	-	100	1
Semester Credits : 23						
II	Language II	LT201/LH201/LS201	40	60	100	3
	English II	LE202	40	60	100	3
	Classical Algebra	UM203	40	60	100	4
	Vector Calculus and Fourier Series	UM204	40	60	100	4
	Allied Statistics II	UM205	40	60	100	4
	Lab – Basics of Matlab	UM206	40	60	100	5
	Skill Development Course – Language skill-Grammar	LS208	50	-	50	1
	Sanskrit and Indian culture II	IC207	100	-	100	1
Semester Credits : 25						
III	Language III	LT301/LH301/LS301	40	60	100	3
	English III	LE302	40	60	100	3
	Allied Physics I	UM303	40	60	100	4
	Differential Equations and Applications	UM304	40	60	100	4
	Numerical Methods	UM305	30	45	75	4
	Allied Physics Practical*		-	-	-	-
	Skill Development Course – Language skill-comprehension	LS306	50	-	50	1
	Quantitative Aptitude		100	-	100	1
Semester Credits : 20						
IV	Language IV	LT401/LH401/LS401	40	60	100	3
	English IV	LE402	40	60	100	3
	Allied Physics II	UM403	50	-	50	4
	P.D.E and TransformTechniques	UM404	40	60	100	4
	Graph Theory	UM405	30	45	75	4
	Allied Physics Practical	UM406	20	30	50	4
	Skill Development Course – Language skill-Writing	LS407	50	-	50	1
	Logic and Verbal Reasoning	LV408	100	-	100	1
Semester Credits : 24						
V	Statics	UM501	40	60	100	4
	Sequences and Series	UM502	40	60	100	4
	Complex Analysis	UM503	40	60	100	4
	Abstract Algebra	UM504	40	60	100	4
	Programming in C	UM505	40	60	100	4
	Programming in C Lab*		-	-	-	-
	Skill Development Course – Language skill-Spoken language	LS506	50	-	50	1
	Data Interpretation		100	-	100	1
Semester Credits : 22						

VI	Dynamics	UM601	40	60	100	4
	Real Analysis	UM602	40	60	100	4
	Linear Algebra	UM603	40	60	100	4
	Operations Research	UM604	40	60	100	4
	Discrete Mathematics & Automata Theory	UM605	40	60	100	4
	Programming in C Lab	UM606	40	60	100	5
	Personality Development course		100	-	100	1
Semester Credits : 26						
Total Credits : 140						

*continued for next semester.

SEMESTER - I

Semester-I

Semester	Part	Sub. Code	Title of the Paper	L	P	T	Credits
I	I	BCHF181TT0	Tamil -I	2	-	1	3

நோக்கம் : *எளிமையான மொழி ஆக்கங்களை அறிந்து கொள்ளும் வகையில் மக்கள் இலக்கியமான நாட்டுப்புற இலக்கிய வகையிலிருந்து சிலவும், உரைநடையின் எளிய வடிவமான சிறுகதைகள் சிலவற்றை அறிமுகம் செய்துவைக்கும் நோக்கில் சிலவும், கவிதை வடிவம் பற்றி உணர பாரதியார் தொடங்கி தற்காலப் புதுக்கவிஞர்கள் சிலரின் படைப்புகளும் தரப்பட்டுள்ளன. அடிப்படை மொழிப்பயிற்சி தரப்பட்டுள்ளது.*

பயன் : *வாழ்க்கையின் அனுபவங்களின், உணர்வுகளின் 'இயல்பான வெளிப்பாடு கலை' என்பதை உணர்தல்; நல்ல, உயர்வான படைப்பாளிகளை அறிந்துகொள்ளுதல்; இலக்கியத் தேடல் ஆர்வத்தைத் தூண்டுதல்.*

அலகு – 1 (12 Hrs)

தமிழ் இலக்கிய வரலாறு

1. நாட்டுப்புற இலக்கிய வரலாறு
   நாட்டுப்புறப் பாடல்கள், நாட்டுப்புறக் கதைகள், நாட்டுப்புறக் கதைப் பாடல்கள், பழமொழிகள், விடுகதைகள்

2. உரைநடை இலக்கிய வரலாறு
   சிறுகதைகள் தோற்றமும் வளர்ச்சியும்

3. கவிதை இலக்கிய வரலாறு
   புதுக் கவிதைகள் தோற்றமும் வளர்ச்சியும்

அலகு – 2 (12 Hrs)

1. வாய்மொழி இலக்கியம் நாட்டுப்புறப் பாடல்கள்
   தாலாட்டு, காதல், ஒப்பாரி

2. புதுமைப்பித்தன் சிறுகதைகள்
   கடவுளும் கந்தசாமிப் பிள்ளையும் , செல்லம்மா
   துன்பக்கேணி, ஆற்றங்கரைப் பிள்ளையார், பொன்னகரம்

அலகு – 3 (12 Hrs)

1. பாரதியார்
   காணி நிலம் வேண்டும், நல்லதோர் வீணை

2. பாரதிதாசன்
   தமிழ்க் காதல், தமிழ் வளர்ச்சி, எந்நாளோ?

3. கவிமணி தேசிய விநாயகம் பிள்ளை
   ஆறு தன் வரலாறு கூறுதல்

அலகு – 3 (12 Hrs)

1. ந. பிச்சமூர்த்தி – வழித்துணை
2. சிற்பி – முள்... முள்.... முள்...
3. அப்துல் ரகுமான் – குருடர்களின் யானை

அலகு – 5 (12 Hrs)

மொழிப் பயிற்சி

1. பொருத்திய சொல் தருதல்
2. மரபுத் தொடர்கள்

பார்வை நூல்கள்:

1. புதுமைப்பித்தன் சிறுகதைகள், பாரி புத்தகப் பண்ணை, 184, பிராட்வே, சென்னை–108.
2. தமிழக நாட்டுப்புற பாடல்கள், முனைவர். சண்முக சுந்தரம், பூம்புகார் பிரசுரம், சென்னை.
3. புதுக்கவிதை – ஒரு புதுப்பார்வை, பாலா, அன்னம் பதிப்பகம், புதுக்கோட்டை.
4. பாரதியார் கவிதைகள், மாணிக்கவாசகர் நூலகம், சிதம்பரம்.
5. மொழித்திறன் – பூவண்ணன், வர்த்தமானன் பதிப்பகம், தி.நகர், சென்னை.

ENGLISH - I

L	P	T	C
3	0	1	3

Unit I: Essays

1. Education for New India
2. Advantages of Anonymity
3. Film Making

Unit II: Essays

4. At School
5. Visit of Pagodas
6. Tolerance

Unit III: Vocabulary

Unit IV: Basic Grammar

1. Articles
2. Pronouns –Personal & Impersonal
3. Adjectives
4. Synonyms & Antonyms
5. Sentence Structure

Unit V: Communication through Grammar

6. Tense forms
7. Idioms &Phrases
8. Suitability & Verbs
9. E-Mail
10. Patterns of Greeting

Book prescribed:

1. ***At Home with English*** (An Anthology of Modern English Prose for Developing Communication Skills) Ed. T.M. Farhathullah. Lessons 7 to 12 (Allied Publishers, Chennai)

ANALYTICAL GEOMETRY AND TRIGONOMETRY

UNIT-I	L	P	T	C
	4	0	1	4

Polar equations- Straight lines-Circles- Conics- Tangent-Normal

UNIT-II

Rectangular Cartesian coordinates-Direction cosines of a line – The plane

Unit-III

The straight line – Plane and straight line- Coplanar lines

Unit- IV

Sphere – Cone- Cylinder

UNIT-V

Expansions- Hyperbolic functions- Logarithm of complex numbers

Recommended Text

T.K.Manickavachagom Pillay & others. (2004) *Analytical Geometry* (Two & Three Dimensions) S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

S.Narayanan, Trigonometry

Reference Books

1. P.Duraipandian and LaxmiDuraipandian *Analytical Geometry-2D,* Asia Publishing company, Bombay

2. P.Duraipandian and LaxmiDuriapandian *Analytical Geometry-3 D*, Emerald Publishers, Chennai.

3. G.B.Thomas and R.L.Finney. *Calculus and Analytic Geometr*y, Addison Wesley , Mass. (Indian Print).

4. P.R.Vittal *Coordinate Geometry.* Margham Publishers, Chennai

CALCULUS

L	P	T	C
4	0	1	4

UNIT-I

Partial differentiations. Total differentials; Jacobians; Maxima and Minima of functions of 2 and 3 independent variables - necessary and sufficient conditions (without proof); Lagrange's method (without proof) - simple problems on these concepts.

UNIT-II

Envelopes-Curvature-Circle, radius and centre of curvature – Cartesian formula for the radius of curvature- The coordinates of the centre of curvature

UNIT-III

Evolutes and involutes- radius of curvature in polar coordinates- p-r equation- Pedal equation of curve-chord of curvature

UNIT-IV

Linear asymptotes – Singular points- Tracing of curves

Unit-V

Reduction formulae- Bernoulli’s formula

TEXT BOOKS:

1. Calculus volume-1 by T.K. ManikavasagamPilly, S.Viswanathan (Printers and Publishers Pvt Ltd) 2010 print
2. Calculus Volume-II by T.K. ManikavasagamPilly, S.Viswanathan(Printers and Publishers Pvt Ltd) 2010 print
   Unit-I ; Volume I
   Unit-II: Volume I: Chapter X; Section 1, Section 2-2.1 to 2.4
   Unit-III : Volume I : Chapter X; Section 2.5-3.1
   Unit-IV: Volume I Chapter XI, XII and XIII
   Unit- V: Volume II; Chapter1; Sections 13-15.1

PRINCIPLES OF ENVIRONMENTAL SCIENCE

L	P	T	C
4	0	1	4

Unit - 1 : Introduction to environment and environmental studies

1.1.Introduction to environment – components – nature of environment - need of awareness – water crisis - climatic change - fossil fuels– pollution – loss of biodiversity – deforestation – their impacts - reasons for environmental problems – anthropocentric and eco centric views.

1.2. Environmental studies - multidisciplinary nature – scope and aim – sustainable development-principles – RRR concept- extension – response of world community – Indian environmental movements – environmental calendar.

Unit – 2 : Ecosystem and Biodiversity

2.1. Ecosystem – structure – functions – simplified ecosystem models (food chain and food webs and their types) - forest – grassland – pond – desert- estuary ecosystems – ecological succession - ecological pyramids – Bio-geochemical cycles of water – oxygen-carbon-phosphorous and sulphur.

2.2.Biodiversity – definition – types – species – genetic and ecosystem diversities- values of biodiversity – threats to biodiversity – conservation of biodiversity – endemism – biodiversity hotspots – Indian biodiversity – soils of India – floristic regions – endemic species of India – IUCN lists -red-green and blue data books.

Unit – 3 : Natural resources

3.1 Natural resources – definition – types – forest resources – uses –deforestation- reasons - effects – water resources – distribution of water in the globe – other reasons for problems – conservation of water – dams – effects of dams - food resources – modern agriculture– ill effects -energy resources-types – hydel –nuclear – solar –wind and biomass energy - world scenario – Indian scenario

3.2 Population and environment – reasons for over exploitation of resources – population – demography – population curves – population explosion – effects – consumerism – effects – urbanization – reasons and effects- role of an individual.

Unit – 4 : Environmental Pollution

4.1 Pollution – definition – types – air pollution – causes and effects – effects of CO_2 – CO – NOx – SOx – particulates – control of air pollution – water pollution – causes – effects – remedies – soil pollution – solid waste management – e waste – ill effects of e-waste – proper recycling- Noise pollution – reasons – effects – control – nuclear pollution – cases – effects and control – marine and thermal pollution causes – effects and remedies

4.2 Legal provisions for protecting environment – article 48 A – 51 A (g) – Environment act 1986 – Air act 1981 – Water act 1974 – wild life protection act – Forest act 1980- salient features and inadequacies - problems in implementation – reasons

Unit – 5 : Social issues and environmental ethics

5.1 Present environmental scenario – green house effect – climate change – The Kyoto Protocol – ozone layer depletion-The Montreal Protocol - acid rain – causes – effects - disparity among the nations – The Copenhagen UNFCCC summit – carbon currency- virtual water- genetically modified organisms.

5.2 Environmental ethics – introduction – people getting affected - resettlement and rehabilitation – issues involved — SardharSarovar project – TawaMatsya sang - Melting icebergs of Arctic.

Text Book

1. Perspectives in Environmental studies – Anubhakaushik and CP kaushik, New age international publishers, 4th edition, 2014.

Reference books

1. Environmental Studies, N. Nandini, N. Sunitha and SucharitaTandon,Sapna Book House, 2007.
2. Text book of Environmental Science, RagavanNambiar, Scitech Publications, 2009.
3. Text book of Environmental Chemistry and Pollution Control, S.S.Dara, S.Chand and Co., 2002.
4. Environmental Chemistry, Colin Baird, W.H.Freeman and company, New York,1999.
5. Environmental Chemistry, Gary W. VanLoon and Stephen J.Duffy, Oxford University Press, 2000.
6. New Trends in Green Chemistry, V.K. Ahluwalia and M. Kidwai, Anamaya Publishers, 2006.

ALLIED STATISTICS- I

L	P	T	C
4	0	1	4

Unit I Theory of Probability

Introduction-Definition of various terms – Axiomatic approach to Probability – Probability – Conditional Probability- Laws of addition and Multiplication – Bayes Theorem

Unit II Random variables and Distribution Functions

Random variable – Distribution – Discrete Random Variable – Continuous Random Variable

Unit III Mathematical Expectation and Generating Functions

Mathematical Expectation – Addition Theorem of Expectation – Multiplication Theorem of Expectation – Covariance – Expectation of Linear Combination of Random Variables – Variance of Linear Combination of Random variables – Moment Generating Function

Unit IV Theoretical Discrete Distributions

Binomial Distribution – Poisson Distribution-Geometric distribution-moments.

Unit V Theoretical Continuous Distributions

Normal Distribution - Exponential distribution-moments.

Prescribed Text Book:

Veerarajan. T.," Probability, Statistics and Random Processes, Third Edition, Tata McGraw-Hill Publishers, New Delhi 2008

Reference Books:

Elements of mathematical statistics by S.C. Gupta and V.K.Kapoor by Sultan Chand & sons, third edition.
Gupta S.P, Statistical methods, Sultan Chand & Sons
Sheldon Ross, First Course in Probability , Pearson Publications

LAB – BASICS OF MATLAB

Unit-I

Getting started with MATLAB- Getting acquainted with MATLAB windows- Command window- Editor window- Figure window- Help window- Command history widow-Current directory window- Workspace window- Common mathematical operators- Some commonly used mathematical functions-

Unit-II

Creating a matrix and array- Matrix algebra-Transpose-inverse-rank-Accessing elements of a matrix(arrays)- length and size of a matrix- The maximum , minimum and mean of matrix(array) etc., - Direct Concatenation method- reshape function-flipping-Creating special matrices – Solution of system of simultaneous equations.

Unit-III

The plot functions--Histogram plotting-pie graph plotting

Unit-IV

The plot functions-2-D plotting- adding titles-labels –legends-polar plotting- 3-D plotting-surface plotting

Reference Books:

Getting Started with Matlab by RudraPratap, Oxford University Press

Engineering Problem solving with Matlab, D.M.Etter, Printice-Hall

A Matlab Primer, Kermit Sigmon ,

MATLAB Demystified, Basic Concepts and Applications, K KSarma, Vikas Publishing House Pvt Ltd

Applied Numerical Methods with MATLAB by Steven C. Chapra, 3rd Edition, McGrawHill (pdf is available)

Numerical Analysis using Matlab and Spread sheets by Steven T. Karris, 2nd edition, Orchard Publications

An Introduction to Matlab, by David F. Griffiths, Department of Mathematics , University of Dundee

SEMESTER - II

Semester II

Semester	Part	Sub. Code	Title of the Paper	L	P	T	Credits
II	I		Tamil -II	2	-	1	3

நோக்கம் : *தமிழில் பிரபந்தங்கள் எனப்படும் சிற்றிலக்கியங்கள் பற்றிய செய்திகளையும், சிறப்புகளையும் அறிய வகைமை மட்டும் காட்டப்பட்டுள்ளன. சமய இலக்கிய வகையில் கிருத்துவர்களின் தமிழ்த்தொண்டு குறிப்பிடப்பட்டுள்ளது. குறிப்புகள் அறியும் வகையில் இலக்கணம்; மொழிப்பயிற்சி காட்டப்பட்டுள்ளது.*

பயன் : *இலக்கிய வளம் மிகுந்த மொழி 'தமிழ்' என்பதை உணர்தல்; நூறு வகைக்கும் மேற்பட்ட சிற்றிலக்கியங்கள் தமிழில் உள்ளன என்பதறிந்து தமிழின் ஆழ, அகலம் உணர்தல்; சமயங்கள் வளர்த்த தமிழ் பற்றி அறிதல் மொழி இலக்கணத்தின் தொடக்க நிலை பற்றி புரிந்துகொள்ளல்.*

அலகு – 1 (12 hrs)

தமிழ் இலக்கிய வரலாறு :

1. கிருத்துவ இலக்கிய வரலாறு
2. காப்பிய இலக்கிய வரலாறு

அலகு – 2 (12 hrs)

1. நந்திக் கலம்பகம்
2. முத்தொள்ளாயிரம்
3. தமிழ் விடு தூது

அலகு – 3 (12 hrs)

1. திருக்குற்றாலக் குறவஞ்சி (குறத்தி மலைவளம் கூறுதல்)
2. முக்கூடல் பள்ளு (நாட்டு வளம்)
3. இயேசு பிரான் பிள்ளைத் தமிழ் (செங்கீரைப் பருவம் முதல் 5 செய்யுள்கள்)

அலகு – 4 (12 hrs)

1. நளவெண்பா (கலி நீங்கு காண்டம்)

அலகு – 5 (12 hrs)

மொழிப் பயிற்சி:

1. இலக்கண குறிப்புகள்:
   பண்புத்தொகை, வினைத்தொகை,
   உம்மைத் தொகை, அன்மொழித் தொகை,
   இருபெயரொட்டுப் பண்புத்தொகை
2. ஒரு பொருள் குறித்த பல சொற்கள்
3. பல பொருள் குறித்த ஒரு சொல்
4. அகர வரிசைப்படுத்துதல்

பார்வை நூல்கள்:

1. தமிழிலக்கிய வரலாறு – முனைவர். மு.வ., பாரி நிலையம், சென்னை.
2. தமிழிலக்கிய வரலாறு – ஜெ. ஸ்ரீசந்திரன், தமிழ் நிலையம், சென்னை.
3. தமிழ் சிற்றிலக்கியங்கள் – நா. வீ. செயராமன்.

ENGLISH –II

L	P	T	C
3	0	1	3

Unit I: Essays

1. Computers
2. Voter
3. The World of Albert Einstein

Unit II: Essays

1. The Cop and the Anthem
2. The Photographer
3. What Can One Do?

Unit III: Vocabulary

Unit IV: Grammar I

1. Relative pronouns
2. Adverbs
3. Prepositions
4. Phrasal verbs
5. Idioms

Unit V: Grammar II

1. Active Voice & Passive Voice
2. Infinitives & Gerunds
3. Conditionals
4. Collocations
5. American and British words

Book prescribed:*At Home with English* (An Anthology of Modern English Prose for Developing Communication Skills) Ed. T.M. Farhathullah. Lessons 7 to 12 (Allied Publishers, Chennai)

	L	P	T	C
CLASSICAL ALGEBRA	**4**	**0**	**1**	**4**

Unit-I

Vandermonde's theorem- Binomial theorem for rational index- Particular cases of the Binomial expansion- Sign of terms in the Binomial expansion- Application of the Binomial theorem to the summation of series- Sum of the coefficients – Approximate values- Exponential series-Summation- The logarithmic series

Unit-II

Theory of equations- Remainder theorem-Every n^{th} degree equation has exactly n roots and no more-Relation between roots and coefficients of equations- symmetric function of the roots-Sum of powers of roots of an equation- Newton's theorem on sum of powers of the roots

Unit-III

Transformation of equations-Reciprocal equations- Reciprocal roots-Removal of terms- Transformation in general- Descarte's Rule of sings- Rolle's theorem and its applications- Multiple roots

Unit-IV

Strum's theorem-Solution of numerical equations-Horner's method (upto 2 decimals)

Unit-V

General solution of the cubic equations- Cardon's method- Solution of biquadratic equations- Ferrari's method

Text Book

A Text Book of Algebra by T.K. Manickavasagam Pillai

VECTOR CALCULUS AND FOURIER SERIES	L	P	T	C
	4	0	1	4

UNIT-I

Double Integrals in polar and Cartesian coordinates- change of order of integration- polar and Cartesian coordinates- triple integrals- Beta and Gamma functions- properties- simple problems

UNIT-II

Vector differentiation- Gradient- Divergence- Curl

UNIT-III

Vector integration – Line integral- Surface integral- Volume integral

UNIT-IV

Green's theorem- Stoke's theorem- and Gauss divergence theorem (without profs) and simple applications

UNIT-V

Fourier series- The Cosine and Sine series- Even and Odd functions- Half range series

Recommended Text

B.S.Grewal. *Higher Engineering Mathematics* (2002), Khanna Publishers, New Delhi.

Reference Books

1. G.B.Thomas and R.L.Finney. (1998) *Calculus and Analytic Geometry*, Addison Wesley (9th Edn), Mass. (Indian Print).
2. M.K.Venkataraman. (1992) *Engineering Mathematics-Part B*. National Publishing Company, Chennai.
3. P.R.Vittal. (2004) *Vector Calculus, Fourier series and Fourier Transform*. Margham Publications, Chennai.

ALLIED STATISTICS- II

L	P	T	C
4	0	1	4

Unit I

Correlation- scatter diagram- Karl Pearson coefficient of correlation- Calculation of the correlation coefficient for a bivariate frequency distribution- Rank correlation

Unit II

Regression- Lines of regression – Regression coefficients- properties of regression coefficients- Angle between two lines of regression.

Unit III

Theory of Attributes- Introduction – Notations – Dichotomy- classes and class frequencies – Order of classes and class frequencies- Class symbol as operators – Consistency of data- Independence of attributes- Association of attributes.

Unit IV

Test of significance- Null hypothesis- Errors in sampling- Critical region and level of significance- Tests of significance for large and small samples - Standard error – Test of significance for single mean, difference of mean and difference of standard deviations.

Unit V

Exact sampling distributions- Chi- square variate- Derivation of the chi- square distribution M.G.F. of χ^2- distribution- Chi-square test for independence of attributes and goodness of fit.

Text book

Elements of mathematical statistics by S.C. Gupta and V.K.Kapoor by Sultan Chand & sons, third edition.

SEMESTER - III

Semester III

Semester	Part	Sub. Code	Title of the Paper	L	P	T	Credits
III	I		Tamil –III	2	-	1	3

நோக்கம் : *தமிழின் சிறந்த அமைப்பான 'பக்தி இலக்கியம்' பற்றி உணர்வதற்காக சைவ, வைணவ இலக்கியப் பாடல்கள் தரப்பட்டுள்ளன. நீதி நூல் – திருக்குறளின் மேன்மை உணர 5 அதிகாரங்கள் தரப்பட்டுள்ளன. இலக்கிய வரலாறு பல்லவர் காலமும், உரைநடை சிறப்பு அறிய மு.வ. வின் கட்டுரைகளும், தமிழர் பண்பாடு பற்றி அறிதற்கான குறிப்புகளும் தரப்பட்டுள்ளன.*

பயன் : *அளவில் அதிகமான படைப்புகளை, பக்தி சார்ந்த படைப்புகளாகத் தமிழ் கொண்டுள்ளது என்பதுணர்தல் ;பக்திமொழி என்று தமிழ் அழைக்கப்படுவதை அறிதல் ; சைவ, வைணவ சமய நூல்களை அறிதல் ; பக்தி இயக்க காலத்தின் தொடக்கமான பல்லவர் கால இலக்கியங்களை அறிதல் ; தமிழர்களின் பண்பாடு பற்றிய சில செய்திகளைத் தெரிந்துகொள்ளல், அறிவுரை தரும் குறட்பா செய்திகளையும், மு.வ.வின் 'நல்வாழ்வு' பற்றிய செய்திகளையும் அறிதல்.*

1. செய்யுள்
2. மொழித்திறன்
3. இலக்கிய வரலாறு
4. உரைநடை
5. தமிழ்ப் பண்பாடு

அலகு – 1 செய்யுள் (12 hrs)

1. திருக்குறள் – ஐந்து அதிகாரங்கள்
2. சம்பந்தர் தேவாரப் பதிகம் ஒன்று மட்டும்
3. குலசேகர ஆழ்வாரின் பெருமாள் திருமொழி பாசுரப்பகுதி

அலகு – 2 மொழித்திறன் (12 hrs)

1. நேர்காணல்
2. கலைச்சொல்

அலகு – 3 இலக்கிய வரலாறு (12 hrs)

1. பல்லவர் கால இலக்கியங்களின் வரலாறு

அலகு – 4 உரைநடை (12 hrs)

1. மு.வ.வின். நல்வாழ்வு நூலில் 6 முதல் 10 தலைப்பு வரை

அலகு – 5 தமிழ்ப்பண்பாடு (12 hrs)

1. தமிழ்ப்பண்பாடு அறிமுகம் என்ற அளவில் சுமார் 45 பக்க அளவுள்ள செய்திகள்.

பார்வை நூல்கள்:

1. மொழித்திறன் – முனைவர். மு.வ., பாரி நிலையம், சென்னை.
2. நல்வாழ்வு – முனைவர். மு.வ., முல்லை நிலையம், சென்னை.
3. நல்ல தமிழ் எழுத வேண்டுமா? – அ. கி. பரந்தாமன், சென்னை.
4. தேவாரப் பதிகங்கள் – சண்முகம் பிள்ளை, நிரஞ்சன விலாச பதிகம், சென்னை.

ENGLISH- III

L	P	T	C
3	0	1	3

UNIT I: Poetry for Detailed Study (Short and Long Answers only):

1. Ozymandias – Percy Bysshe Shelley
2. Mending Wall – Robert Frost
3. Where the Mind is Without Fear – Rabindranath Tagore

UNIT II: Short Stories:

1. Am I Blue? – Alice Walker.
2. The Last Leaf – O. Henry
3. The Selfish Giant – Oscar Wilde

UNIT III: One Act Play

1. Soul Gone Home – Langston Hughes

UNIT IV: Words Study

1. Vocabulary
2. Spelling

UNIT V: Modes of Communication

1. Writing
2. Degrees of Comparison
3. Factual Writing

All these to be taught from exercises given after the end of each lesson

Book Prescribed:

Radiance – Emerald Publishers, Casa Major Road, Egmore, Chennai-600008.

ALLIED PHYSICS –I

L	P	T	C
4	0	1	4

Objective:

- *The basic concepts of simple harmonic motion, waves and oscillations- their behavior and moment of Inertia.*
- *To makes student understand gravitational laws and gravitational constant and the properties and behavior of elastic materials.*
- *To create the awareness about basic properties of sound waves and their properties and also it enhances the knowledge about ultrasonics and optical properties and their experimental evidences.*
- *To make the students to get feel of understanding the building blocks of modern electronics science.*

UNIT – I: Mechanics (12 hrs)

Simple harmonic motion, phase-equations of wave motion-compound pendulum- center of suspension-interchangeability center of oscillation and suspension- Moment of Inertia –Radius of gyration – Angular Momentum – torque – Theorems of M.I - M.I. of uniform rod, disc, circular ring, solid sphere –Kinetic energy of rotating energy- Acceleration of a body rolling down on an inclined plane.

UNIT – II: Gravitation and Elasticity (12 hrs)

Law of gravitation–constant G - Kepler's laws-relation between G and g – earth's mass and density - variation of the acceleration due to gravity - orbital velocity - escape velocity - types of modulii - Poission's ratio relation between y, n & k – bending of beams - bending moment – cantilever cantilever loaded at one end-supported at two ends and loaded in the middle.

UNIT – III: Sound (12 hrs)

Transverse waves – velocity along a stretched string-laws of transverse vibration of strings-verification of laws-Melde's experiment-ultrasonics-generation - piezo-electric effect- -detection of ultrasonics-applications-determination of velocity of sound in a liquid

UNIT – IV: Optics (12 hrs)

Defects in images -chromatic aberration-spherical aberration- Determination of refractive index using spectrometer -Newton's rings-determination of wavelength and refractive index of liquid-plane transmission grating-resolving power of diffraction grating-determination of wavelength- Nicol prism –double refraction

UNIT – V: Basic Electronics (12 hrs)

semi conductors - intrinsic and extrinsic types -p-n junction-forward bias, reverse bias- characteristics - full wave rectifier, zener diode, tunnel diode, photo diode, LED -transistor-CE and CB characteristics-transistor amplifier.

Text Books:

1. Modern physics by R Murugeshan&Kiruthiga, Sivaprasath S Chand & Co. 15th edition, (2006)

2. A Text Book of Sound by N. Subramaniam and Brijlal, S. Chand & Co., 2nd revised edition (1995).
3. A textbook of Optics by Subramaniam N, M.N. Avadhanulu, S.Chand, Publishing, 25th edition, (2012)
4. Principles of Electronics V.K.Mehta, Rohit Mehta, S.Chand, 10th edition, (2006).
5. A text book of applied Electronics R.S. Sedha., S.Chand, multicolour revised edition, 2006.

Reference Books:

1. Introduction to Modern Physics by Rich Meyer, Kennard, Coop Tata McGraw Hill Publishing Co. 6th edition.(2009)
2. A Text Book of Sound R. L. Saighal, S. Chand & Co., (2005)
3. Optics and Spectroscopy by Murugeshan, S Chand & Co. Pvt. Ltd., New Delhi.(2010)
4. Foundations of Electronics : Chattopadhyay, D.,Raxshit, P.C. Sara, B and Purkait New Age International (P) Limited.(2015)

DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS

	L	P	T	C
Unit I	**4**	**0**	**1**	**4**

Differential equation of first order –Equation of the first order and first degree, Homogeneous equations, exact differential equations- Integrating factors- linear equations- Bernoulli's equation- equation solvable for p, y and x- Clairaut's equation.

Unit II

Linear equation of second order with constant coefficients - Methods of finding complementary functions – Methods of finding particular integrals. Homogeneous linear equations – Euler – Cauchy equations - Linear equations with variable coefficients

Unit III

Method of variation of parameters- Simultaneous linear differential equations.

Unit IV

Applications of differential equations- Orthogonal trajectories- Growth and decay- Continuous compound interest- The Brachistochrone problem- Tautochronous property of the cycloid- Simple electric circuits- Falling bodies- simple harmonic motion – Simple pendulum-

Unit V

Differential equations- Formation of partial differential equations- Methods of solving first order partial differential equations- Some standard forms- Charpit's method.

Recommended Texts

1. B.S.Grewal Higher Engineering Mathematics, Khanna Publishers, New Delhi.

2. SheplyL.Ross, Differential Equations, III Edition John Wiley & Sons, New York.

Reference Books

1. M.D. Raisinghania, Ordinary and Partial Differential Equations, S.Chand and Co., New Delhi.

2. M.R.Spiegel ,Advanced mathematics for Engineers and Scientists, Tata McGraw Hill Edition, New Delhi.

NUMERICAL METHODS

L	P	T	C
4	0	1	4

Unit I

Solution of equations

Solution of algebraic and transcendental equations - Bisection method – Method of false position (Regula-Falsi Method) - Newton-Raphson Iterative method - Solution of linear simultaneous equations - Direct methods of solution: Gauss elimination method , Gauss – Jordan method – Iterative methods of solution : Jacobi's method , Gauss – Seidel method

Unit II

Finite differences

Introduction – First differences – Higher Differences – Difference Tables- Backward Differences- Central Difference Notation – Properties of the operator Δ - Differences of a polynomial – Factorial Polynomials – Simple Problems – Error Propagation in a difference table – Operators E, ∇, δ, μ – Basic Properties.

Unit III

Interpolation

Introduction- Linear Interpolation- Gregory Newton's forward interpolation formula – Newton's backward interpolation formula – equidistant terms with one or more missing values – error in polynomial interpolation- error in Newton's interpolation formulae

Central difference interpolation formulae:

Central difference tables- Central difference interpolation formulae- Gauss's Forward and Backward Interpolation Formulae – Stirling's Formula- Bessel's Formua – Laplace – Everett Formula- Simple Problems.

Unit IV

Interpolation with Unequal Intervals

Divided difference – properties of divided differences – Newton's Interpolation formula for unequal intervals- Lagrange's interpolation formula- Inverse Interpolation – simple problems.

Unit V

Numerical differentiation: Introduction - Newton's Forward and Backward difference formula to compute the derivatives upto second order – Derivatives using Strilings formula- Maxima and Minima of a tabulated function

Numerical Integration: TheTrapezoidal rule -Simpson's one-third rule - Simpson's three-eighth rule – Truncation error in Simpson's formula.

Recommended Text

M.K. Venkataraman. (1992) *Numerical methods for Science and Engineering* National Publishing Company, Chennai.

Reference Books

1. S. Arumugham. (2003) *Numerical Methods*, New Gamma Publishing, Palamkottai.
2. H.C. Saxena. (1991) *Finite differences and Numerical analysis* S.Chand& Co., Delhi
3. A.Singaravelu (2004). *Numerical Methods* Meenakshi Agency, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) Calculus of Finite difference & Numerical Analysis, S.Chand& Company Ltd., New Delhi-55.

SEMESTER - IV

Semester IV

Semester	Part	Sub. Code	Title of the Paper	L	P	T	Credits
IV	I		Tamil -IV	2	-	1	3

நோக்கம் – *தமிழின் தொன்மை இலக்கியமான சங்ககாலத்தில் அகம், புறம் இலக்கியம் பற்றி அறிய குறுந்தொகை, புறநானூறு பாடல்கள் தரப்பட்டுள்ளன. காப்பியச் சிறப்புணர சிலம்பும், பெரியபுராணமும் உள்ளன. மொழி நூல் நோக்கில் தமிழின் பெயர், வினைச்சொல் பற்றியும், நாயக்கர் கால இலக்கியங்கள் பற்றிய குறிப்புகளும் பயிற்றுவிக்கப்படவுள்ளன.*

பயன் : *தமிழில் என்றென்றும் சிறந்த படைப்பாகத் திகழும் 'சங்க இலக்கியம்' பற்றி அறிதல்; தமிழ்க் காப்பியங்கள் பற்றி அறிதல்; தமிழ்ச் சொல் இலக்கிணம், சொல் பற்றிய வகைமை, அமைப்பு பற்றி அறிதல் ; நாயக்கர் காலத்தில் தோன்றிய, சிறந்த இலக்கியநூல்களையும், உரையாசிரியர்கள் தமிழக்குச் செய்த தொண்டினையும் உணர்தல்.*

1. செய்யுள்
2. இலக்கணம்
3. இலக்கிய வரலாறு

அலகு – 1 செய்யுள் (12 Hrs)

1. குறுந்தொகை – 10 பாடல்கள்
   பா.எண்: 02, 03, 16, 20, 31, 40, 49, 69, 124, 167.
2. புறநூனூறு – 03 பாடல்கள்
   பா.எண்: 18, 266, 279.
3. சிலப்பதிகாரம் – வழக்குரை காதை
   80 அடிகளும், 3 வெண்பாக்களும்.
4. பெரிய புராணம் – அப்பூதியடிகள் நாயனார் புராணம்
   45 பாடல்கள்.

அலகு – 2 இலக்கணம் (12 Hrs)

தமிழ் மொழியின் அமைப்பு
சொல்லியல் – பெயர்ச்சொல், வினைச்சொல்

அலகு – 3 இலக்கிய வரலாறு (12 Hrs)

2. நாயக்கர் காலம் – சிற்றிலக்கியங்கள், உரையாசிரியர்கள்

பார்வை நூல்கள்:

1. குறுந்தொகை – உ.வே.சா., அண்ணாமலை பல்கலைப் பதிப்பகம், சிதம்பரம்.
2. புறநூனூறு – புலியூர் கேசிகன், அருணா பதிப்பகம், சென்னை.
3. சிலப்பதிகாரம் – புலியூர் கேசிகன், அருணா பதிப்பகம், சென்னை.
4. பெரியபுராணம் – தருமையாதீனம், மயிலாடுதுறை.

ENGLISH-IV

L	P	T	C
3	0	1	3

Unit-1: Letter Writing

Unit II: Comprehension

Unit III: Report Writing

Unit IV: Dialogue Writing

Unit V: Group Discussion

Book Prescribed:

Radiance – Emerald Publishers, Casa Major Road, Egmore, Chennai-600008. (Relevant Exercises at the end of all lessons including prose from ***Radiance*****)**

ALLIED PHYSICS –II

L	P	T	C
4	0	1	4

Objective:

- To makes the student aware about the modern wave mechanics which are basic for the modern physics by explaining the quantum view of physics.
- Explains the basics concepts and properties of nucleus and about the various particle accelerators.
- To make students to understand the modern lasers, modern electronics and digitization of computers.

UNIT- I Modern physics: (12 hrs)

Einstein's photo electric equation – verification of Einstein's photo electric equation by Millikan's experiment – photo electric cells – applications

Wave mechanics: De Broglie concept of matter waves – characteristics and calculation of De Broglie wave length -Study of De Broglie matter wave by G.P.Thomson experiment.

UNIT- II Nuclear physics: (12 hrs)

Nuclear forces –characteristics - nuclear structure by liquid drop model – Binding energy – mass defect – particle accelerators – cyclotron and betatron – nuclear Fission and nuclear Fusion – introduction to elementary particles – Leptons, Mesons and Baryons

UNIT III Laser physics: (12 hrs)

Principles of laser– population inversion – meta stable state – conditions for laser actions - Types – Nd-Yag – Helium – neon laser – applications of lasers – Raman effect – Raman shift – stokes and anti stokes lines

UNIT IV Semiconductor physics: (12 hrs)

Volt – Ampere Characteristics of P-N junction Diode – Zener diode – applications of Zener diodes - Volt – Ampere Characteristics of FET, UJT and SCR – Principles of LED and LCD – Frequency Modulation and Amplitude modulation –principles and applications of RADAR.

UNIT V Digital Electronics: (12 hrs)

Number systems – conversion of binary into decimal – conversion of decimal to binary – binary addition and subtraction – Basic logic gates – NAND and NOR as an universal logic gates – Demorgan's theorems – Boolean algebra – applications of Demorgans theorems – Half adder and full adder circuits.

Text Books

1. Modern physics by R Murugeshan S Chand & Co. (1984)
2. Nuclear Physics D G Tayal - Himalayan Publishing House (2008)
3. Elements of Nuclear Physics - M L Pandya & R P S Yadav, 7th edition, Kedasnath Ram nath publisher (2013).
4. Principles of Electronics V.K.Mehta. (1980)
5. A text book of applied Electronics R.S. Sedha. (2008)

R**eference Books**

1. Introduction to Modern Physics by Rich Meyer, Kennard, Coop Tata McGraw Hill Publishing Co. (1969)
2. Nuclear Physics S N Ghoshal - S Chand & Co. Edition , 1st edition, (1994).
3. Nuclear Physics - Irving Keplan, 2nd edition, Addison Wesley publishing company, (1955).
4. Foundations of Electronics : Chattopadhyay, D.,Raxshit, P.C. Sara, B and Purkait New Age International (P) Limited, 3rd edition, (2015)

PARTIAL DIFFERENTIAL EQUATIONS AND TRANSFORM TECHNIQUES

Unit I

L	P	T	C
4	0	1	4

Homogeneous linear partial differential equations with constant coefficients – Methods of finding C.F. – Methods of finding P.I.

Unit II

Application of partial differential equations- Method of separation of variables – Vibration of a stretched string: Wave equation- solution of wave equation-D'Alembert's solution of wave equation – One dimensional heat flow – Solution of heat equation

Unit III

Laplace transform – standard forms – linear property – first shifting theorem – multiplication by t^n – Division by t – Laplace transform of derivatives and integrals

Inverse Laplace transform(usual types)- applications of Laplace transform to solution of first and second order linear differential equations(constant co efficient)

Unit IV

Fourier transform

Infinite Fourier transform (complex form, no derivation)- sine and cosine transforms- simple properties of fourier transforms – convolution theorem- parseval's identity.

Unit V

Z – Transforms

Standard z-transforms of $1, a^n, n^p$ – Linearity property – Damping rule – Shifting rules – Multiplication by n - Initial and final value theorems (without proof) – inverse z –transforms – Convolution theorem (without proof) – Convergence of z-transforms – Evaluation of inverse z-transforms: Power series method, Partial fraction method, inversion integral method

Recommended Texts

B.S.Grewal Higher Engineering Mathematics, Khanna Publishers, New Delhi.

Reference Books

1. M.K.Venkataraman. *Engineering Mathematics-Part B*. National Publishing Company, Chennai.

GRAPH THEORY

L	P	T	C
4	0	1	4

Unit I

Graphs and Subgraphs – Introduction – Definition and Examples – Degree of a vertex – subgraphs – isomorphism of Graphs – Ramsey Numbers – Independent sets and Coverings

Unit-II

Intersection Graphs and Line Graphs – Adjacency and Incidence Matrices – Operations on Graphs – Degree Sequences – Graphic Sequences

Unit III

Connectedness -Introduction – Walks, Trails, paths, components, bridge, block - Connectivity

Unit IV

Eulerian Graphs – Hamiltonian Graphs

Unit V

Trees – Characterization of Trees – Centre of a Tree – Planarity – Introduction, Definition and Properties – Characterization of Planar Graphs – Thickness – Crossing and Outer Planarity

Recommended Text

S.Arumugam and S.Ramachandran, "Invitation to Graph Theory", SITECH Publications India Pvt. Ltd., 7/3C, Madley Road, T.Nagar, Chennai - 17

Reference Books

1. S.Kumaravelu, SusheelaKumaravelu, Graph Theory, Publishers, 182, Chidambara Nagar, Nagercoil-629 002.

2. S.A.Choudham, A First Course in Graph Theory, Macmillan India Ltd.

3. Robin J.Wilson, Introduction to Graph Theory, Longman Group Ltd.

4. J.A.Bondy and U.S.R. Murthy, Graph Theory with Applications, Macmillon, London.

Semester V & VI	L	P	T	C
	-	4	-	4

ALLIED PHYSICS PRACTICAL

(ANY 10 EXPERIMENTS ONLY)

1. Acceleration due to gravity-Compound pendulum method
2. Moment of inertia – Torsional pendulum method
3. Young's modulus - Uniform bending - Optic lever method
4. Young's modulus - Non-uniform bending - Pin and microscope
5. Rigidity modulus – Static torsion method.
6. Frequency of A.C - Sonometer
7. Thermal conductivity - Lee's disc method.
8. Refractive index of a solid prism - Spectrometer
9. Refractive index of a liquid prism – Spectrometer
10. (i-d) curve - solid prism - Spectrometer
11. Wavelengths of spectral lines – Grating - Normal incidence - Spectrometer
12. Wavelength of spectral lines – Grating - Minimum deviation - Spectrometer
13. Radius of curvature of lens - Newton's rings method.
14. Viscosity of highly viscous liquid - Stoke's method.
15. Surface tension - Drop weight method
16. Characteristics of Pn Junction diode
17. Characteristics of Zener diode
18. Verification of truth tables of logic gates.

Reference:

Engineering Physics Lab Manual – By Dr. K. Venkatramanan et al., SCSVMV

SEMESTER - V

STATICS

L	P	T	C
4	0	1	4

Unit I

Types of forces – magnitude and direction of the resultant of the forces acting on a particle - Forces acting at a point – Lami's theorem, equilibrium of a particle under several coplanar forces.

Unit II

Parallel forces- moments - couples

Unit III

Equilibrium of three forces acting on a rigid body- Coplanar forces acting on a rigid body.

Unit IV

Friction

Laws of friction- angle of friction-equilibrium of a body

Limiting friction

Unit V

Center of gravity of simple uniform bodies – triangular lamina- rod forming a triangular-trapezium- center of gravity of circular arc- elliptic quadrant- solid hemisphere, cone-hollow hemisphere and cone

Equilibrium of strings – catenary.

Recommended Text

M.K. Venkataraman (1990) *Statics*. A Rajhans Publications. (16th Edn), Meerut.

Reference Books

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*, Combridge University Press, 1951

3. A.V. Dharmapadam(1991) *Mechanics*. S. Viswanathan Printers & Publishers. Chennai.

4. Joseph F. Shelley (2005) *Vector Mechanics for Engineers Vol-I: Statics*, Tata McGraw Hill Edition, New Delhi.

SEQUENCES AND SERIES

L	P	T	C
4	0	1	4

Unit I

Sets and elements-Operations on sets- functions-Real-valued functions-Equivalence, count ability- Real numbers- Least upper bounds

Unit II

Definition of sequence and subsequence- Limit of sequence- Convergent sequences- Divergent sequences- Bounded sequences-Monotonic sequences- Operations on convergent sequences- Operations of divergent sequences

Unit III

Limit superior and limit inferior- Cauchy's sequences- summability of sequences

Unit IV

Series of real numbers- Convergence and divergence-series of nonnegative terms- Alternating series- Conditional convergence and absolute convergence- Rearrangement of series- Test for absolute convergence

Unit V

Series whose terms form a non increasing sequence- summatation by parts- (C,1) summability of series- The class l^2

Recommended Text

Methods of real analysis- Richard R. Goldberg(oxford and IBH Publishing Co)

Reference Books

1. G.B.Thomas and R.L.Finney. (1998) *Calculus and Analytic Geometry*, Addison Wesley (9th Edn), Mass. (Indian Print).
2. M.K.Venkataraman. (1992) *Engineering Mathematics-Part B*. National Publishing Company, Chennai.

COMPLEX ANALYSIS

L	P	T	C
4	0	1	4

Unit I

Complex numbers: Point at infinity, stereographic projection

Analytic function

Functions of complex variable, mappings, Limits, theorems of limits without proof, continuity of a complex function - Derivative of a complex function, differentiation formula, Cauchy-Riemann equations, sufficient conditions Cauchy – Riemann equations in polar form, Analytic functions – Harmonic functions Orthogonal system

Unit II

Mapping by elementary functions

Linear functions, the function $\frac{1}{z}$, linear fractional transformations, the functions $w = z^n$, $w = e^z$, special linear fractional transformations.

Unit III

Integration of complex functions

Definite integrals, contours, line integrals, Cauchy- Goursattheorem(without proof) – Cauchy's integral formula – derivatives of analytic functions, maximum moduli of functions.

Unit IV

Series: Convergence of sequences and series (theorems without proof) Taylor's series,Laurent's series – Zeros of analytic functions.

Unit V

Residues and poles

Residues – Residue theorem, the principal part of functions, poles, evaluation of improper real integrals, improper integrals, integrals involving trigonometric functions, definite integrals of trigonometric functions.

Recommended Text

Dr.S.Arumugam, "complex analysis", scitech Publications, Pvt Ltd. chennai.2003.

Reference Books

1. R.V.Churchill and J.W.Brown, (1984) Complex Variables and Applications. McGraw Hill International Book Co., Singapore. (Third Edition)
2. P. Duraipandian and LaxmiDuraipandian (1976) Complex Analysis: Emerald Publishers, Chennai
3. S. Ponnusamy. (2000) Foundations of Complex Analysis, Narosa Publishing House, New Delhi
4. Murray R. Spiegel. (2005) Theory and Problems of Complex Variable. Tata-Mcgraw Hill Edition, New Delhi.

ABSTRACT ALGEBRA

L	P	T	C
4	0	1	4

Unit I

Definition of groups- examples- elementary properties- equivalent definitions- cyclic groups- order of an element.

Unit II

Subgroups -Cosets and Lagrange's theorem- normal subgroups – quotient groups- homomorphism.

Unit III

Isomorphism-automorphism- Cayley's theorem- permutations – transpositions, cycles – odd and even permutations - permutation groups – symmetric group Sn

Unit-IV

Rings- definition and examples- elementary properties of rings- characteristic of a ring – integral domain - Field

Unit-V

Homomorphism of a rings-Kernal-Fundamental theorem of homomorphism-ideals and quotient rings-prime ideal –maximal ideal

Recommended Text

I.N.Herstein. Topics in Algebra, (2nd Edn.) Wiley Eastern Ltd. New Delhi

Reference Books

1. S.Arumugam. Modern Algebra. Scitech Publications, Chennai.

2. J.B.Fraleigh A First Course in Algebra (3rd Edition) Addison Wesley, Mass. (Indian Print)

3. Lloyd R.Jaisingh and Frank Ayres,Jr. Abstract Algebra, (2nd Edition), Tata McGraw Hill Edition, New Delhi.

4. M.L.Santiago Modern Algebra, Tata McGraw Hill, New Delhi.

5. Surjeet Singh and QaziZameeruddin. Modern Algebra. Vikas Publishing House Pvt. Ltd. New Delhi.

PROGRAMMING IN C

L	P	T	C
4	0	1	4

Unit I

C Constants, variables, Data-type, Declaration of variables, assigning values to variables.

Unit II

Operators Arithmetic, Relational, Logical, Assignment, Increment and decrement, Conditional, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic operators, Formatted input and output.

Unit III

Operators and Arrays Decision making and branching If, simple if, If else, Nesting of if - else, Else - If ladder, Switch statement, the?: operator, Go to statement. Decision making with looping: While, Do, For statement, Jumps in loops. Arrays: 1 - dimensional array, 2 - dimensional array, Initializing 2 - dimensional array, Multi - dimensional arrays.

Unit IV

User-Defined Function Need for User-defined function, Multi-function program, the form of C-Function, Return Value and their types. Structures and Unions: Structure definition, Structure initialization, Comparison of structure variables, union.

Unit V

Pointers Understanding Pointers, Accessing the address of a variable, Declaring and initializing of pointers, accessing a variable through its pointer, Pointer expression. Pointers and arrays, Pointers and structures.

Recommended Text

E.Balagurusamy. (1996) Programming in ANSI C. Tata McGraw Hill, New Delhi

Reference Books

1. V.Rajaraman. (1995) Computer Programming in C. Prentice Hall. New Delhi

2. H. Schildt, Obsborne. (1994) Teach Yourself C McGraw Hill. New York.

3. Mullish Cooper. The Spirit of C- An Introduction to Modern Programming. Jaico Publishing House. Delhi. 1998.

4. Yashavantkanetkar, let us C, 16TH edition BPB publication.

SEMESTER - VI

DYNAMICS

L	P	T	C
4	0	1	4

Unit – I

Kinematics: Speed – Displacement – Velocity -Relative Velocity -Angular velocity–Relative Angular velocity- Acceleration – Constant acceleration-Variable acceleration –Acceleration of falling bodies, Vertical motion under gravity, Bodies freely falling downward.

Unit-II

Introduction-Momentum-Newton's Laws of Motion-Motion of a connected particles -Work-Power-Energy -Limiting velocity in a resisting medium-Resistance proportional to the speed-Resistance proportional to the square of the speed

Unit – III

Projectiles: Definitions – Two fundamental principles – Path of a projectile is a parabola – Characteristics of the motion of a projectile – Horizontal Range of projection – Velocity of projectile- Time of flight -Range on an inclined plane -Motion on the surface of smooth inclined plane.

Unit – IV

Impulsive Forces: Impulse – Impulsive Force – Impact of two bodies – Loss of Kinetic energy in impact- motion of a shot and Gun —Impact of water on surface-Collision of elastic bodies: Definitions – Fundamental Laws of Impact – Impact of a smooth sphere on a fixed smooth plane – Direct impact of two smooth spheres – Oblique impact of two smooth spheres.

Unit – V

S.H.M in a straight line – General solution of the S.H.M. equation – Geometrical representation – Change of origin-Composition of two S.H.M of the same period and in the same straight line, in two perpendicular directions-Motion of a particle suspended by a spiral spring-Horizontal oscillations of a particle tied to an elastic spring – S.H.M. on a curve – simple pendulum – period of oscillation of a simple pendulum – equivalence simple pendulum – seconds pendulum – loss or gain in the number of oscillation made by a pendulum.

Text Book:

Dr. M.K. Venkataraman, 2004, A Text Book of Dynamics (Eleventh Edition), Agasthiar Publications, Tiruchy.
Unit-I - (Chapter – III ,Sections 3.1 to 3.31)
Unit-II-.(Chapter IV , Sections 4.1 to 4.36 & Chapter V, Sections 5.1 to 5.6)
Unit-III-(Chapter VI (Sections 6.1 to 6.16)
Unit-IV-(Chapter – VII (Sections 7.1 to 7.6), Chapter – VIII (Sections 8.1 to 8.9))
Unit-V-(Chapter – X (Sections 10.1 to 10.16)

Reference Books:

1. Narayanan. S., 1986, Dynamics, Sultan Chand and co., Chennai.
2. Mechanics-P.Duraipandian and others, S.chand and co.
3. Dynamics-K.Viswanatha naik and M.S.Kasi, Emerald publishers.
4. Dynamics-A.V. Dharmapadam, S.Viswanathan publishers.

REAL ANALYSIS

L	P	T	C
4	0	1	4

Unit I

Limit of a function on the real line- Metric spaces- Limits in metric spaces- Functions continuous at a point on the real line- Functions continuous on metric spaces-open sets-closed sets

Unit II

More about open sets-Connected sets-Bounded sets and totally bounded sets – Complete metric spaces

Unit III

Compact metric spaces- Continuous functions on compact metric spaces- Continuity of the inverse function – Uniform continuity

Unit IV

Sets of measures zero – Definition of Riemann integral – Existence of Riemann integral-Properties of Riemann integral

Unit-V

Derivatives- Rolle's theorem – The law of the mean- Fundamental theorem of calculus-Improper integrals- Taylor series- L'Hospital's rule

Recommended Text

Methods of Real Analysis- Richard R. Goldberg(oxford and IBH Publishing Co)

Reference Books

1. A course of Mathematical Analysis, Shanthi Narayan and P.K.Mittal, S.Chand & Company
2. Bartle and Sherbett, *Introduction to Real Analysis*.
3. Rudin, *Principles of Mathematical Analysis*.
4. Spivak, *Calculus on Manifolds*.
5. Chapter 1 of S. Kumaresan, *A Course in Differential Geometry and Lie Groups.*
6. L. Cohen and Ehrlick, *Structure of the Real Number System.*
7. T. Apostol, *Calculus, vols I and II*

LINEAR ALGEBRA

L	P	T	C
4	0	1	4

Unit I

Introduction – Vector spaces- Definition and Examples – Subspaces- Linear transformation

Unit II

Span of set – Linear Independence- Basis and Dimension- Rank, Nullity and Matrix of linear transformation.

Unit III

Elementary transformations- Rank of a matrix- Simultaneous linear equations – Bilinear forms and Quadratic forms

Unit IV

Characteristic equation and Cayley Hamilton theorem- Eigen values and Eigen vectors

Unit V

Inner product spaces- Definition and Examples- Orthogonality- Orthogonal complement

Recommended Text

I.N.Herstein. *Topics in Algebra*. Wiley Eastern Ltd. New Delhi.

Reference Books

1. S.Arumugam. *Modern Algebra.* Scitech Publications, Chennai.
2. J.B.Fraleigh *A First Course in Algebra* (3rd Edition) Addison Wesley. Mass. (Indian Print)
3. S.Lipschutz *Beginning Linear Algebra*, Tata McGraw Hill Edition, New Delhi.
4. M.L.Santiago. *Modern Algebra,* Tata McGraw Hill, New Delhi.
5. Surjeet Singh and QaziZameeruddin. *Modern Algebra.* Vikas Publishing House Pvt. Ltd., New Delhi,

OPERATIONS RESEARCH

L	P	T	C
4	0	1	4

Unit I

Introduction – Mathematical Formulation of a Linear Programming Problem – Graphical Solution.Simplex Method: Introduction – The Computational Procedure –

Unit II

Use of Artificial Variables – Big M method – Two – phase Simplex method - concepts of duality -Duality in Linear Programming – Primal-Dual relation – Formulating a dual problem .

Unit III

Transportation Problem – Finding Initial Basic Feasible Solution – Test for Optimality – degeneracy – MODI method

Assignment Problem – Mathematical formulation – Hungarian method– Travelling sales man problem

Unit IV

Two person zero sum game with saddle point- without saddle point- dominance – solving 2 X n or m x 2 game by graphical methods.

Unit V

Sequencing problem – n jobs through 2 machines- n jobs through 3 machines – two jobs through m machines.

Recommended Text

KantiSwaroop, Gupta P.K. and Manmohan, *Problems in Operation Research*, Sultan Chand & Sons.

Reference Books

1. Taha H.A. *Operations Research,* Macmillan Publishing Company, New York.
2. V.K.Kapoor *Operations Research*, Sultan Chand & sons.
3. P.R.Vittal, *Operations Research*, Margham Publications, Chennai.
4. J.K.Sharma, *Operations Research: Theory And Applications* Macmillan, Delhi
5. S.J.Venkatesan, *Operations Research*, J.S. Publishes, Cheyyar-604 407.

DISCRETE MATHEMATICS AND AUTOMATA THEORY

L	P	T	C
4	0	1	4

Unit-I Logic

Introduction-TF statements-Connectives-Atomic and compound -Well formed formulae-Truth table of formula- tautology-Tautology implications and equivalence of formulae-Replacement process-Functionally complete set of connectives and duality law-Normal forms – Principle Normal forms –Theory of inference-Open statements-Quantifiers-valid formula and equivalence-theory of inference for predicate calculus-Statements involving more than one quantifier.

Unit-II Relations

Cartesian product of two sets-Relations-Representation of relations-Equivalence relations-Closures and Warshall's Algorithm-Partitions and Equivalence classes.

Unit-III Lattices and Boolean Algebra

Poset- Lattices- some properties of lattices-Modular and distributive lattices-Boolean Algebras-Boolean Polynomials-Karnaugh map-Switching circuits.

Unit-IV Finite Automata

Introduction-Finite Automata- Representation of Finite Automata –Acceptability of a string by a finite Automaton-Language accepted by a finite Automaton- Nondeterministic Finite Automata- Acceptability of a string by NFA- Equivalence of DFA and NFA-Procedure for finding an FA equivalent to a given NFA-Reduction of number of states in finite automata.

Unit-V Regular Language and Regular grammar

Formal definition of Regular expression-Language associated with RE-Connection between RE and RL- Closure properties of regular languages - Identifying some non regular languages using Pumping lemma

TEXT BOOKS:

1. Discrete Mathematics , M.K. Venkataraman, The National Publishing Company

REFERENCES BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science J.P. Trembly and Manohar, TataMcGraw-Hill Publications
2. Elements of Discrete Mathematics, Liu, Tata Mac Graw Hill
3. Kolman B,Busby R.C. and Ross S., Discrete Mathematical Structures for Computer Science, Fifth Edition, Prentice Hall of India, New Delhi, 2006.

Semester V&VI

C PRACTICALS

The following exercises shall be performed as minimum mandatory requirements (for eligibility to take the practical examination) and a RECORD of the code-listing and outputs shall be maintained by each students.

1. Assigning the ASCII value.
2. Square of numbers: Using For loop, While loop
3. Square of numbers: Do-While loop, Goto statement.
4. Characters between two given characters.
5. Number of vowels and consonants.
6. Three – dimensional matrix.
7. Prime numbers between two give numbers.
8. Fibonacci series.
9. Factorial of numbers
10. Power of a value.
11. Interchange sort.
12. Student record.

Reference Books

1. The spirit of C, Mullish Cooper, Indian Edition by Jaico Publishers, 1987.
2. Teach yourself C, Herbert Schildt, Obsbome Megrawhill, 2nd Edition 1994.
3. Programming in C, Schaum Series.